

Ecological Soil Screening Levels for Zinc

Interim Final

OSWER Directive 9285.7-73



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1.0 INTRODUCTION

Ecological Soil Screening Levels (Eco-SSLs) are concentrations of contaminants in soil that are protective of ecological receptors that commonly come into contact with and/or consume biota that live in or on soil. Eco-SSLs are derived separately for four groups of ecological receptors: plants, soil invertebrates, birds, and mammals. As such, these values are presumed to provide adequate protection of terrestrial ecosystems. Eco-SSLs are derived to be protective of the conservative end of the exposure and effects species distribution, and are intended to be applied at the screening stage of an ecological risk assessment. These screening levels should be used to identify the contaminants of potential concern (COPCs) that require further evaluation in the site-specific baseline ecological risk assessment that is completed according to specific guidance (U.S. EPA, 1997, 1998, and 1999). The Eco-SSLs are not designed to be used as cleanup levels and the United States (U.S.) Environmental Protection Agency (EPA) emphasizes that it would be inappropriate to adopt or modify the intended use of these Eco-SSLs as national cleanup standards.

The detailed procedures used to derive Eco-SSL values are described in separate documentation (U.S. EPA, 2003, 2005). The derivation procedures represent the collaborative effort of a multi-stakeholder group consisting of federal, state, consulting, industry, and academic participants led by what is now the U.S. EPA Office of Solid Waste and Emergency Response (OSWER).

This document provides the Eco-SSL values for zinc and the documentation for their derivation. This document provides guidance and is designed to communicate national policy on identifying zinc concentrations in soil that may present an unacceptable ecological risk to terrestrial receptors. The document does not, however, substitute for EPA's statutes or regulations, nor is it a regulation itself. Thus, it does not impose legally-binding requirements on EPA, states, or the regulated community, and may not apply to a particular situation based upon the circumstances of the site. EPA may change this guidance in the future, as appropriate. EPA and state personnel may use and accept other technically sound approaches, either on their own initiative, or at the suggestion of potentially responsible parties, or other interested parties. Therefore, interested parties are free to raise questions and objections about the substance of this document and the appropriateness of the application of this document to a particular situation. EPA welcomes public comments on this document at any time and may consider such comments in future revisions of this document.

2.0 SUMMARY OF ECO-SSLs FOR ZINC

Zinc is found in almost all minerals and is ranked as the twenty-third most abundant element in the earth's crust. The principal ores of zinc are sphalerite, smithsonite, calamine, and franklinite (O'Neill, 2001; Lide, 2005). Elemental zinc is not found in the environment but instead occurs in compounds in the 2+ oxidation state, often as zinc sulfide or zinc oxide (HSDB).

Zinc is released to the environment from both natural and anthropogenic sources, the latter being the most important. Zinc has many commercial uses as coatings to prevent corrosion for electrical apparatus such as dry cell batteries, and mixed with other metals to make alloys like brass, and bronze (O'Neill, 2001). Zinc compounds such as zinc chloride, zinc oxide and zinc sulfate are used in herbicides, fungicides and bacteriostats. Zinc may also be released to the environment from its use in rubbers, paints, and cosmetics (ATSDR, 2005; Goodwin, 1998; ANL, 2005) and as the result of metal smelting, mining, electroplating, coal and oil combustion, and waste incineration (ATSDR, 2005; Ursinyova, 1999). Urban runoff from building siding and roofs, automobile brakes, tires, and oil leakage is another important source of zinc in the environment (Davis, 2001)(HSDB).

Total zinc content in soils is dependent on the composition of the parent rock material (Kiekens, 1990; HSDB). The total amount of zinc in soils is distributed as one of three forms: 1) free ions (Zn^{2+}) and organo-zinc complexes in soil solution; 2) adsorbed and exchangeable zinc in the colloidal fraction of the soil and 3) secondary minerals and insoluble complexes in the solid phase of the soil. The distribution of zinc among the forms is dependant on the concentration of Zn^{2+} and other ions in the solution, the kind and amount of adsorption sites associated with the solid phase of the soil, the concentration of all ligands capable of forming organo-zinc complexes, and pH and redox potential of soil (Alloway, 1990).

Background concentrations reported for many metals in U.S. soils are described in Attachment 1-4 of the Eco SSL guidance (U.S. EPA, 2003). Typical background concentrations of zinc in U.S. soils are plotted in Figure 2.1 for both eastern and western U.S. soils.

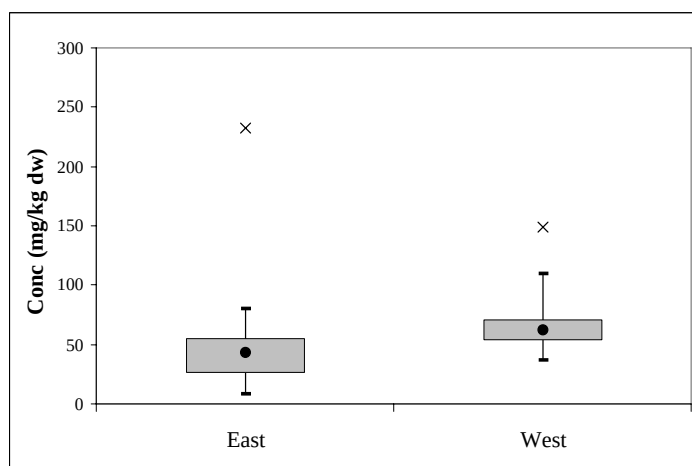
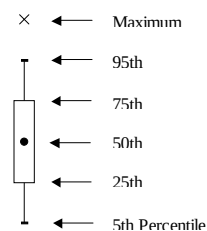


Figure 2.2 Typical Background Concentrations of Zinc in U.S. Soils



Zinc is expected to demonstrate low mobility in most soils, and is strongly adsorbed to soils at pH 5 or greater (Evans, 1989; Blume, 1991; Christensen, 1996). Only those fractions of zinc in soil which are soluble or may be solubilized are bioavailable. Compared to total zinc content of soils, concentrations of zinc in soil solution are low. The solubility of zinc increases at decreasing pH (Alloway, 1990). The bioavailability of zinc in soils is also influenced by total zinc content, pH,

organic matter, microbial activity, moisture, and interactions with other macro and micronutrients (Kieken, 1990; HSDB).

Zinc is an essential trace element for higher plants and animals. In higher plants zinc is absorbed as the divalent cation (Zn^{2+}) which is a metal component of enzymes or a functional, structural or regulatory cofactor of a large number of enzymes. Zinc is involved in carbohydrate and protein metabolism and is required for the synthesis of indoleacetic acid. In plants, zinc deficiency is commonly indicated by stunted growth, interveinal chlorosis, and leaf symptomatology such as small leaves, malformations, and dieback while zinc excess commonly produces iron chlorosis (Chapman, 1966, Kieken, 1990).

In animals, zinc is an essential nutrient for regulating a number of metalloenzymes (ATSDR, 2005). Absorption of zinc occurs from all segments of the intestine, although the largest proportion of zinc absorption occurs from the duodenum (ATSDR, 2005). Following absorption by the intestine, zinc is rapidly distributed to the liver, kidneys, prostate, muscles, bones, and pancreas. Zinc salts adversely affect tissues, interfere with the metabolism of other ions such as copper, calcium, and iron, and inhibit erythrocyte production and function (ATSDR, 2005; WHO, 2001; ECB, 2004; HSDB).

Zinc deficiency has been associated with dermatitis, anorexia, growth retardation, poor wound healing, hypogonadism with impaired reproductive capacity, and impaired immune function (ATSDR, 2005). Nutritional requirements of zinc for common mammalian and avian test organisms are compiled in Attachment 4-3 of the Eco-SSL guidance (U.S. EPA, 2003, 2005). Zinc excess in avian species is associated with decreased body weight, gizzard and pancreatic lesions, and biochemical changes (WHO, 2001). Mammalian studies have shown vomiting, depressed growth rate, purgation, and ataxia (Clarke, 1981; Friberg, 1986; HSDB).

The Eco-SSL values derived to date for Zinc are summarized in Table 2.1.

Table 2.1 Zinc Eco-SSLs (mg/kg dry weight in soil)			
Plants	Soil Invertebrates	Wildlife	
		Avian	Mammalian
160	120	46	79

Eco-SSL values were derived for all receptor groups. The Eco-SSL values for zinc range from 46 mg/kg dry weight (dw) for avian wildlife to 160 mg/kg dw for terrestrial plants. The Eco-SSL for avian wildlife is less than the 25th percentile of reported background soil concentrations of zinc in western U.S. soils and less than the 75th percentile for eastern U.S. soils (Figure 2.1). The Eco-SSL for mammalian wildlife is less than the 96th percentile for both eastern and western U.S. soils (Figure 2.1). The Eco-SSLs for plants and soil invertebrates are higher than the 95th percentile for both eastern and western U.S. soils. The avian and mammalian Eco-SSL values are based on exposures of receptors consuming zinc in soil invertebrates.

3.0 ECO-SSL FOR TERRESTRIAL PLANTS

Of the papers identified from the literature search process, 680 papers were selected for acquisition for further review. Of those papers acquired, 78 met all 11 Study Acceptance Criteria (U.S. EPA, 2003; Attachment 3-1). Each of these papers were reviewed and the studies were scored according to the Eco-SSL guidance (U.S. EPA, 2003; Attachment 3-2). Thirty-nine study results received an Evaluation Score greater than ten (U.S. EPA, 2003; Attachment 3-1). These studies are listed in Table 3.1.

The studies in Table 3.1 are sorted by bioavailability score. There are five studies with a bioavailability score of 2 that are eligible for Eco-SSL derivation. These results were used to derive the plant Eco-SSL for zinc (U.S. EPA, 2003; Attachment 3-2). The Eco-SSL is the geometric mean of the maximum acceptable toxicant concentration (MATC) values for three species under different test conditions (pH and % organic matter (OM)) and is equal to 160 mg/kg dw.

4.0 ECO-SSL FOR SOIL INVERTEBRATES

Of the papers identified from the literature search process, 162 papers were selected for acquisition for further review. Of those papers acquired, 26 met all 11 Study Acceptance Criteria (U.S. EPA 2003; Attachment 3-1). Each of these papers were reviewed and the studies were scored according to the Eco-SSL guidance (U.S. EPA, 2003; Attachment 3-2). Forty studies received an Evaluation Score greater than ten. These studies are listed in Table 4.1.

The studies in Table 4.1 are sorted by bioavailability score. There are six studies with a bioavailability score of 2 that are eligible for Eco-SSL derivation. These results were used to derive the soil invertebrate Eco-SSL for zinc (U.S. EPA, 2003; Attachment 3-2). The Eco-SSL is the geometric mean of the EC_{10} and MATC values for at least three test species under different test conditions (pH and OM%) and is equal to 120 mg/kg dw.

Table 3.1 Plant Toxicity Data - Zinc

Reference	IP Number	Study ID	Test Organism		Soil pH	OM%	Bio-availability Score	ERE	Tox Parameter	Tox Value (Soil Conc at mg/kg dw)	Total Evaluation Score	Eligible for Eco-SSL Derivation?	Used for Eco-SSL?
White et al., 1979b	57096	d	soybean	<i>Glycine max</i>	6.5	1.2	2	GRO	MATC	185	13	Y	Y
Roszyk et al., 1988	13624	p	oats	<i>Avena sp.</i>	4.3	0.8	2	GRO	MATC	143	18	Y	Y
Roszyk et al., 1988	13624	b	oats	<i>Avena sp.</i>	5.3	2.6	2	GRO	MATC	155	18	Y	Y
Roszyk et al., 1988	13624	u	oats	<i>Avena sp.</i>	5.7	1.3	2	GRO	MATC	159	18	Y	Y
Sheppard et al., 1993	4146	b	lettuce	<i>Lactuca sativa</i>	6.3	<1	2	GRO	MATC	173	12	Y	Y
Geometric Mean										160			
Data Not Used to Derive Plant Eco-SSL													
De Haan et al., 1985	5048	e	oats	<i>Avena sativa</i>	5.4	7	1	GRO	MATC	283	11	N	N
Roszyk et al., 1988	13624	l	mustard	<i>Brassica sp.</i>	5.3	2.6	2	GRO	LOAEC	105	18	N	N
Roszyk et al., 1988	13624	a	oats	<i>Avena sp.</i>	4.2	0.7	2	GRO	LOAEC	95	17	N	N
Roszyk et al., 1988	13624	n	mustard	<i>Brassica sp.</i>	4.2	0.7	2	GRO	LOAEC	95	17	N	N
Singh and Jeng, 1993	12400		Ryegrass	<i>Lolium</i>	6.0	0.1	2	GRO	NOAEC	50	14	N	N
Monette, 1978	45950	a	spinach	<i>Spinacia oleracea</i>	6.9	1.9	2	GRO	NOAEC	20	12	N	N
Monette, 1978	45950	b	barley	<i>Hordeum vulgare</i>	6.9	1.9	2	GRO	NOAEC	20	12	N	N
White et al., 1979b	57096	a	soybean	<i>Glycine max</i>	5.5	1.2	2	GRO	LOAEC	131	12	N	N
Rehab and Wallace, 1978	46710	b	cotton	<i>Gossypium barbadense</i>	6.6	2.4	1	GRO	MATC	283	14	Y	N
Roszyk et al., 1988	13624	zc	oats	<i>Avena sp.</i>	5.7	5.7	1	GRO	MATC	319	18	Y	N
Roszyk et al., 1988	13624	d	oats	<i>Avena sp.</i>	5.6	2.3	1	GRO	MATC	361	17	Y	N
Roszyk et al., 1988	13624	z	oats	<i>Avena sp.</i>	5.9	2.3	1	GRO	MATC	169	17	Y	N
Roszyk et al., 1988	13624	g	mustard	<i>Brassica sp.</i>	5.6	2.3	1	GRO	MATC	177	17	Y	N
Rehab and Wallace, 1978	46710	a	cotton	<i>Gossypium hirsutum</i>	6.6	2.4	1	GRO	MATC	283	14	Y	N
Dang et al., 1990	12906	E	onion	<i>Allium Cepa</i>	8.3	0.5	1	GRO	MATC	141	11	Y	N
Dang et al., 1990	12906	H	Fenugreek	<i>Trigonella foenum</i>	8.3	0.5	1	GRO	MATC	283	11	Y	N
Roszyk et al., 1988	13624	zb	Seradela	<i>Ornithopus compressus</i>	5.6	5.2	1	GRO	LOAEC	102	17	N	N
Roszyk et al., 1988	13624	ze	Seradela	<i>Ornithopus compressus</i>	5.7	5.7	1	GRO	LOAEC	95	17	N	N
Roszyk et al., 1988	13624	zi	oats	<i>Avena sp.</i>	5.6	5.2	1	GRO	NOAEC	440	16	N	N
Roszyk et al., 1988	13624	zh	oats	<i>Avena sp.</i>	7.1	3.7	1	GRO	NOAEC	475	16	N	N
Kadar and Morvai, 1998	12988	a	Carrot	<i>Daucus carota</i>	7.0	1.032	1	GRO	MATC	57	17	Y	N
Kadar and Morvai, 1998	12988	b	garden pea	<i>Pisum sativum</i>	7.0	1.032	1	GRO	MATC	34	17	Y	N
Roszyk et al., 1988	13624	kl	mustard	<i>Brassica sp.</i>	5.9	2.3	1	GRO	NOAEC	420	15	N	N
Singh et al., 1991	12701		wheat	<i>Triticum aestivum</i>	8.2	0.086	1	GRO	MATC	113	13	Y	N

Table 3.1 Plant Toxicity Data - Zinc

Reference	IP Number	Study ID	Test Organism		Soil pH	OM%	Bio-availability Score	ERE	Tox Parameter	Tox Value (Soil Conc at mg/kg dw)	Total Evaluation Score	Eligible for Eco-SSL Derivation?	Used for Eco-SSL?
Kucharski and Niklewska, 1992	13292		common bean	<i>Phaseolus vulgaris</i>	7.1	0.32	1	GRO	MATC	330	13	Y	N
Biro et al., 1998	12986	b	red clover	<i>Trifolium pratense L.</i>	7.0	3.00	1	GRO	MATC	90	11	Y	N
Biro et al., 1998	12986	a	alfalfa	<i>Medicago sativa</i>	7.0	3.00	1	GRO	NOAEC	270	11	N	N
Mehta and Singh, 1988	13724		mustard	<i>Brassica sp.</i>	8.5	0.55	1	GRO	NOAEC	30	11	N	N
Roszyk et al., 1988	13624	zm	mustard	<i>Brassica sp.</i>	7.1	3.7	0	GRO	MATC	157	16	Y	N
Roszyk et al., 1988	13624	t	oats	<i>Avena sp.</i>	7.0	3.3	0	GRO	MATC	162	16	Y	N
Sheppard et al., 1993	4146	c	mustard	<i>Brassica rapa</i>	7.9	2.70	0	GRO	MATC	424	12	Y	N
Roszyk et al., 1988	13624	zf	oats	<i>Avena sp.</i>	7.1	3.7	0	GRO	NOAEC	475	16	N	N
Voros et al., 1998	12985	a	red clover	<i>Trifolium pratense L.</i>	7.5	6.50	0	GRO	NOAEC	275	12	N	N
Voros et al., 1998	12985	b	red clover	<i>Trifolium pratense L.</i>	7.5	6.50	0	GRO	NOAEC	275	12	N	N

EC₁₀ = Effect concentration for 10% of test population

EC₂₅ = Effect concentration for 25% of test population

EC₅₀ = Effect concentration for 50% of test population

ERE = Ecologically relevant endpoint

GRO = Growth

LOAEC = Lowest observed adverse effect concentration

MATC = Maximum acceptable toxicant concentration. Geometric mean of NOAEC and LOAEC.

N = No

NOAEC = No observed adverse effect concentration

ns = Not specified

OM = Organic matter content

PHY = Physiology

REP = Reproduction

Y = yes

cnbd = Could Not Be Determined

Bioavailability Score described in *Guidance for Developing Eco-SSLs* (U.S. EPA, 2003)

Total Evaluation Score described in *Guidance for Developing Eco-SSLs* (U.S. EPA, 2003)

Table 4.1 Invertebrate Toxicity Data - Zinc

Reference	IP Number	Study ID	Test Organism		Soil pH	OM%	Bio-availability Score	ERE	Tox Parameter	Tox Value (Soil Conc at mg/kg dw)	Total Evaluation Score	Eligible for Eco-SSL Derivation?	Used for Eco-SSL?
Smit et al., 1998	11279		Springtail	<i>Folsomia candida</i>	4.8	2.4	2	REP	EC ₁₀	99	15	Y	Y
Korthals et al., 1998	13828		Nematode	multiple	4.1	4.0	2	POP	MATC	35	13	Y	Y
Korthals et al., 1996	4402		Nematode	multiple	4.1	3.2	2	POP	MATC	141	13	Y	Y
Smit and Van Gestel, 1997	4434		Springtail	<i>Folsomia candida</i>	4.5	1.9	2	REP	EC ₁₀	116	17	Y	Y
Smit and Van Gestel, 1998	6159	b	Springtail	<i>Folsomia candida</i>	4.7	2.4	2	REP	EC ₁₀	136	17	Y	Y
Smit and Van Gestel, 1998	6159	d	Springtail	<i>Folsomia candida</i>	4.7	2.4	2	REP	EC ₁₀	355	17	Y	Y
Geometric Mean										120			
Data not Used to Derive Soil Invertebrate Eco-SSL													
Spurgeon and Hopkin, 1996	4067	a	Earthworm	<i>Eisenia fetida</i>	4.0	5.0	2	REP	NOAEC	115	16	N	N
Spurgeon and Hopkin, 1996	4067	b	Earthworm	<i>Eisenia fetida</i>	5.0	5.0	2	REP	NOAEC	85	16	N	N
Peredney and Williams, 2000b	56449	y	Nematode	<i>Caenorhabditis elegans</i>	4	1.14	2	MOR	LC ₅₀	54.2	13	N	N
Peredney and Williams, 2000b	56449	aa	Nematode	<i>Caenorhabditis elegans</i>	4	4.2	2	MOR	LC ₅₀	186	13	N	N
Donkin and Dusenbery, 1994	7877	b	Nematode	<i>Caenorhabditis elegans</i>	5.1	3.0	2	MOR	LC ₅₀	255	15	N	N
Van Gestel and Hensbergen, 1997	10987		Springtail	<i>Folsomia candida</i>	6.0	10.0	1	REP	EC ₁₀	399	13	Y	N
Sandifer and Hopkin, 1996	4056	a	Springtail	<i>Folsomia candida</i>	6.0	10.0	1	REP	MATC	863	14	Y	N
Sandifer and Hopkin, 1996	4056	b	Springtail	<i>Folsomia candida</i>	5.0	10.0	1	REP	MATC	548	14	Y	N
Sandifer and Hopkin, 1996	4056	c	Springtail	<i>Folsomia candida</i>	4.5	10.0	1	REP	MATC	548	14	Y	N
Spurgeon et al., 1997	4442	a	Earthworm	<i>Eisenia fetida</i>	6.0	10.0	1	REP	LOAEC	190	13	Y	N
Smit and Van Gestel, 1998	6159	a	Springtail	<i>Folsomia candida</i>	6.0	10.0	1	REP	EC ₁₀	269	17	Y	N
Smit and Van Gestel, 1998	6159	c	Springtail	<i>Folsomia candida</i>	7.0	2.0	1	REP	EC ₁₀	1059	17	Y	N
Van Gestel et al., 1993	6828		Earthworm	<i>Eisenia andrei</i>	6.0	10.0	1	REP	MATC	423	12	Y	N
Sandifer and Hopkin, 1997	758		Springtail	<i>Folsomia candida</i>	6.0	10.0	1	REP	MATC	548	15	Y	N
Spurgeon and Hopkin, 1996a	7870		Earthworm	<i>Eisenia fetida</i>	6.0	10.0	1	REP	MATC	466	12	Y	N
Posthuma et al., 1997	2380	a	Earthworm	<i>Enchytraeus crypticus</i>	6.4	10.0	1	REP	EC ₅₀	188	13	N	N
Posthuma et al., 1997	2380	b	Earthworm	<i>Enchytraeus crypticus</i>	6.4	10.0	1	REP	EC ₅₀	336	13	N	N
Spurgeon and Hopkin, 1996	4067	c	Earthworm	<i>Eisenia fetida</i>	6.0	5.0	1	REP	NOAEC	97	16	N	N
Spurgeon and Hopkin, 1996	4067	d	Earthworm	<i>Eisenia fetida</i>	4.0	10.0	1	REP	NOAEC	161	16	N	N
Spurgeon and Hopkin, 1996	4067	e	Earthworm	<i>Eisenia fetida</i>	5.0	10.0	1	REP	NOAEC	183	16	N	N
Spurgeon et al., 1994	4364		Earthworm	<i>Eisenia fetida</i>	6.3	10.0	1	REP	EC ₅₀	276	11	N	N
Spurgeon et al., 1997	4442	c	Earthworm	<i>Eisenia fetida</i>	6.0	10.0	1	REP	EC ₅₀	234	13	N	N
Smit and Van Gestel, 1996	7869	a	Springtail	<i>Folsomia candida</i>	6.0	3.3	1	REP	EC ₅₀	348	15	N	N

Table 4.1 Invertebrate Toxicity Data - Zinc

Reference	IP Number	Study ID	Test Organism		Soil pH	OM%	Bio-availability Score	ERE	Tox Parameter	Tox Value (Soil Conc at mg/kg dw)	Total Evaluation Score	Eligible for Eco-SSL Derivation?	Used for Eco-SSL?
Smit and Van Gestel, 1996	7869	b	Springtail	<i>Folsomia candida</i>	6.0	3.0	1	REP	EC ₅₀	185	15	N	N
Neuhauser et al., 1985a	17707		Earthworm	<i>Eisenia fetida</i>	6.0	10.0	1	MOR	LC ₅₀	232	14	N	N
Conder and Lanno, 2000	46691		Earthworm	<i>Eisenia andrei</i>	6.5	10.0	1	MOR	ILL	631	16	N	N
Peredney and Williams, 2000a	53082		Nematode	<i>Caenorhabditis elegans</i>	4	10	1	MOR	LC ₅₀	670	12	N	N
Peredney and Williams, 2000b	56449	ac	Nematode	<i>Caenorhabditis elegans</i>	4	10	1	MOR	LC ₅₀	661	12	N	N
Donkin and Dusenbery, 1994	7877	a	Nematode	<i>Caenorhabditis elegans</i>	6.2	1.7	1	MOR	LC ₅₀	183	15	N	N
Donkin and Dusenbery, 1994	7877	c	Nematode	<i>Caenorhabditis elegans</i>	6.1	3.4	1	MOR	LC ₅₀	392	15	N	N
Donkin and Dusenbery, 1994	7877	d	Nematode	<i>Caenorhabditis elegans</i>	6.2	2.2	1	MOR	LC ₅₀	549	15	N	N
Spurgeon and Hopkin, 1995	6822		Earthworm	<i>Eisenia fetida</i>	6.1	10.0	1	GRO	NOAEC	237	11	N	N
Spurgeon and Hopkin, 1996a	7870		Earthworm	<i>Eisenia fetida</i>	6.0	10.0	1	REP	MATC	466	12	Y	N
Spurgeon and Hopkin, 1996	4067	f	Earthworm	<i>Eisenia fetida</i>	6.0	10.0	0	REP	NOAEC	553	16	N	N

EC₁₀ = Effect concentration for 10% of test population

EC₅₀ = Effect concentration for 50% of test population

ERE = Ecologically relevant endpoint

GRO = Growth

ILL = Incipient lethal level

LC₅₀ = Concentration lethal to 50% of test population

LOAEC = Lowest observed adverse effect concentration

MATC = Maximum acceptable toxicant concentration

MOR = Mortality

N = No

NOAEC = No observed adverse effect concentration

OM = Organic matter content

POP = Population

REP = Reproduction

Y = Yes

Bioavailability Score described in *Guidance for Developing Eco-SSLs* (U.S.EPA, 2003)

Total Evaluation Score described in *Guidance for Developing Eco-SSLs* (U.S. EPA, 2003)

5.0 ECO-SSL FOR AVIAN WILDLIFE

The derivation of the Eco-SSL for avian wildlife was completed as two parts. First, the toxicity reference value (TRV) was derived according to the Eco-SSL guidance (U.S. EPA, 2003; Attachment 4-5). Second, the Eco-SSL (soil concentration) was back-calculated for each of three surrogate species representing different trophic levels based on the wildlife exposure model and the TRV (U.S. EPA, 2003).

5.1 Avian TRV

The literature search completed according to the Eco-SSL guidance (U.S. EPA, 2003; Attachment 4-1) identified 10,410 papers with possible toxicity data for either avian or mammalian species. Of these studies, 10,259 were rejected for use as described in Section 7.5. Of the remaining studies, 53 contained data for avian test species. These papers were reviewed and the data were extracted and scored according to the Eco-SSL guidance (U.S. EPA, 2003; Attachment 4-3 and 4-4). The results of the data extraction and review are provided as Table 5.1. The complete results are included as Appendix 5-1.

Within the reviewed papers, there are 168 results for biochemical (BIO), behavior (BEH), physiology (PHY), pathology (PTH), reproduction (REP), growth (GRO), and survival (MOR) effects that meet the Data Evaluation Score of >65 for use to derive the TRV (U.S. EPA, 2003; Attachment 4-4). These data are plotted in Figure 5.1 and correspond directly with the data presented in Table 5.1. The no-observed adverse effect level (NOAEL) results for growth and reproduction are used to calculate a geometric mean. This result is examined in relationship to the lowest bounded lowest-observed adverse effect level (LOAEL) for reproduction, growth, and survival to derive the TRV according to procedures in the Eco-SSL guidance (U.S. EPA, 2003; Attachment 4-5).

A geometric mean of the NOAEL values for reproduction and growth was calculated at 66.1 mg zinc/kg bw/day. This value is lower than the lowest bounded LOAEL for reproduction, growth, or survival. Therefore, the TRV is equal to the geometric mean of NOAEL values within the reproduction and growth effect groups and is equal to 66.1 mg zinc/kg bw/day.

Table 5.1
Avian Toxicity Data Extracted for Wildlife Toxicity Reference Value (TRV)
Zinc
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Result #	Reference	Ref No.	Test Organism	# of Conc/ Doses	Method of Analyses	Route of Exposure	Exposure Duration	Duration Units	Age	Age Units	Lifestage	Sex	Effect Type	Effect Measure	Response Site	NOAEL Dose* (mg/kg bw/day)	LOAEL Dose* (mg/kg bw/day)	Total
Biochemical (BIO)																		
1	Hamilton et al, 1979	6655	Japanese quail (<i>Coturnix japonica</i>)	2	U	FD	14	d	0	d	JV	B	CHM	HMGL	BL	21.5		73
2	Hamilton et al, 1981	6403	Japanese quail (<i>Coturnix japonica</i>)	3	U	FD	7	d	1	d	JV	B	CHM	HMGL	BL	54.3	109	76
3	Jackson et al, 1986	6133	Chicken (<i>Gallus domesticus</i>)	6	U	FD	140	d	40	w	SM	F	CHM	LIPD	LI	55	105	72
4	Gasaway and Buss, 1972	9261	Mallard duck (<i>Anas platyrhynchos</i>)	4	U	FD	45	d	7	w	JV	B	CHM	HMCT	BL	76.5	153	76
5	Berg and Martinson, 1972	93	Chicken (<i>Gallus domesticus</i>)	7	U	FD	2	w	1	d	JV	NR	CHM	ASHC	BO	114	172	71
6	Southern and Baker, 1983	6368	Chicken (<i>Gallus domesticus</i>)	3	U	FD	14	d	8	d	JV	M	CHM	HMGL	BL	177	354	76
7	Hamilton et al, 1979	6655	Japanese quail (<i>Coturnix japonica</i>)	6	U	FD	14	d	0	d	JV	B	CHM	HMCT	BL		22.3	73
8	Lefevre et al, 1982	392	Chicken (<i>Gallus domesticus</i>)	2	U	FD	5	w	1	d	JV	NR	CHM	HMCT	BL		63.2	71
9	Lu et al, 1990	8008	Chicken (<i>Gallus domesticus</i>)	2	U	FD	4	d	14	d	JV	B	ENZ	GENZ	PS		65.7	66
10	Jackson et al, 1986	6133	Chicken (<i>Gallus domesticus</i>)	5	U	FD	3	w	40	w	SM	F	CHM	LIPD	LI		88	66
11	Pimentel et al, 1992	5617	Chicken (<i>Gallus domesticus</i>)	2	M	FD	3	w	1	d	JV	B	CHM	HMGL	WO		132	70
12	Sandoval et al, 1998	7245	Chicken (<i>Gallus domesticus</i>)	2	U	FD	1	w	1	d	JV	F	CHM	MCPR	LI		138	69
13	Oh et al, 1979	6627	Chicken (<i>Gallus domesticus</i>)	2	U	FD	4	w	1	d	JV	NR	CHM	GBCM	LI		252	66
14	Bafundo et al, 1984	2517	Chicken (<i>Gallus domesticus</i>)	2	U	FD	14	d	8	d	JV	F	CHM	HMGL	WO		284	69
15	Dean et al, 1991	5681	Chicken (<i>Gallus domesticus</i>)	2	M	FD	1	w	1	d	JV	M	CHM	GBCM	SR		757	71
Behavior (BEH)																		
16	Baker and Halpin, 1988	5917	Chicken (<i>Gallus domesticus</i>)	2	M	FD	14	d	8	d	JV	M	FDB	FCNS	WO	15.0		69
17	Sandoval et al, 1997	5247	Chicken (<i>Gallus domesticus</i>)	4	U	FD	20	d	1	d	JV	B	FDB	FCNS	WO	45.4	68.1	79
18	Jackson et al, 1986	6133	Chicken (<i>Gallus domesticus</i>)	6	U	FD	140	d	40	w	SM	F	FDB	FCNS	WO	55	105	75
19	Gibson et al, 1986	6048	Chicken (<i>Gallus domesticus</i>)	6	U	FD	10	w	30	w	JV	F	FDB	FCNS	WO	57.3	66.5	75
20	Gibson et al, 1986	6048	Chicken (<i>Gallus domesticus</i>)	6	U	FD	10	w	30	w	JV	F	FDB	FCNS	WO	64.1	123	75
21	Dewar et al, 1983	37018	Chicken (<i>Gallus domesticus</i>)	4	U	FD	4	w	1	d	JV	B	FDB	FCNS	WO	65.6	131	75
22	Stevenson et al, 1987	8184	Chicken (<i>Gallus domesticus</i>)	9	U	FD	140	d	28	w	JV	F	FDB	FCNS	WO	78.2	104	75
23	Henry et al, 1987	6039	Chicken (<i>Gallus domesticus</i>)	4	U	FD	1	w	1	d	JV	M	FDB	FCNS	WO	92.3	185	79
24	Stevenson et al, 1987	8184	Chicken (<i>Gallus domesticus</i>)	9	U	FD	140	d	28	w	JV	F	FDB	FCNS	WO	99.9	133	75
25	Dewar et al, 1983	37018	Chicken (<i>Gallus domesticus</i>)	3	U	FD	4	d	18	mo	AD	F	FDB	FCNS	WO	159	319	74
26	Oh et al, 1979	6627	Chicken (<i>Gallus domesticus</i>)	6	U	FD	4	w	1	d	JV	NR	FDB	FCNS	WO	252	503	75
27	Bartov, 1996	5373	Chicken (<i>Gallus domesticus</i>)	4	U	FD	2	w	1	w	JV	F	FDB	FCNS	WO	315	629	75
28	Lu and Combs, 1988	5903	Chicken (<i>Gallus domesticus</i>)	2	U	FD	15	d	1	d	JV	NR	FDB	FCNS	WO		21.6	68
29	Stahl et al, 1989	5820	Chicken (<i>Gallus domesticus</i>)	2	U	FD	20	d	1	d	JV	B	FDB	FDNG	WO		31.0	73
31	Lu and Combs, 1988	5866	Chicken (<i>Gallus domesticus</i>)	2	U	FD	12	d	20	d	JV	NR	FDB	FCNS	WO		58.5	68
32	Lefevre et al, 1982	392	Chicken (<i>Gallus domesticus</i>)	2	U	FD	5	w	1	d	JV	NR	FDB	FCNS	WO		63.2	74
33	Jackson et al, 1986	6133	Chicken (<i>Gallus domesticus</i>)	5	U	FD	1	w	40	w	SM	F	FDB	FCNS	WO		88	69
34	Gasaway and Buss, 1972	9261	Mallard duck (<i>Anas platyrhynchos</i>)	4	U	FD	10	d	7	w	JV	B	FDB	FCNS	WO		126	73
35	Pimentel et al, 1992	5617	Chicken (<i>Gallus domesticus</i>)	2	M	FD	3	w	1	d	JV	B	FDB	FCNS	WO		132	73
36	Stepinska et al, 1987	5770	Chicken (<i>Gallus domesticus</i>)	2	U	FD	5	d	71	w	SM	F	FDB	FCNS	WO		205	69
37	Jackson et al, 1986	6133	Chicken (<i>Gallus domesticus</i>)	5	U	FD	1	w	40	w	SM	F	FDB	FCNS	WO		367	69
38	Wight et al, 1986	1624	Chicken (<i>Gallus domesticus</i>)	2	U	FD	5	d	NR	NR	SM	F	FDB	FCNS	WO		517	68
39	Bartov et al, 1994	7956	Chicken (<i>Gallus domesticus</i>)	3	U	FD	1	w	1	w	JV	F	FDB	FCNS	WO		686	69
40	Bartov, 1996	5373	Chicken (<i>Gallus domesticus</i>)	4	U	FD	2	w	1	w	JV	F	FDB	FCNS	WO		1370	69
Physiology (PHY)																		
41	Gibson et al, 1986	6048	Chicken (<i>Gallus domesticus</i>)	6	U	FD	10	w	30	w	JV	F	PHY	FDCV	WO	57.3	66.5	75
42	Gibson et al, 1986	6048	Chicken (<i>Gallus domesticus</i>)	6	U	FD	10	w	30	w	JV	F	PHY	FDCV	WO	64.1	123	75
43	Roberson and Schaible, 1960	14538	Chicken (<i>Gallus domesticus</i>)	3	U	FD	4	w	1	d	JV	M	PHY	FDCV	WO	74.3	111	79
44	Roberson and Schaible, 1960	14538	Chicken (<i>Gallus domesticus</i>)	3	U	FD	4	w	1	d	JV	M	PHY	FDCV	WO	75.7	114	79
45	Stevenson et al, 1987	8184	Chicken (<i>Gallus domesticus</i>)	9	U	FD	140	d	28	w	LB	F	PHY	FDCV	WO	83.3	99.9	75
46	Stevenson et al, 1987	8184	Chicken (<i>Gallus domesticus</i>)	9	U	FD	140	d	28	w	JV	F	PHY	FDCV	WO	88.6	106	75
47	Roberson and Schaible, 1960	14538	Chicken (<i>Gallus domesticus</i>)	4	U	FD	4	w	1	d	JV	M	PHY	FDCV	WO	155	232	79
48	Roberson and Schaible, 1960	14538	Chicken (<i>Gallus domesticus</i>)	4	U	FD	4	w	1	d	JV	M	PHY	FDCV	WO	159	239	79
49	Henry et al, 1987	6039	Chicken (<i>Gallus domesticus</i>)	4	U	FD	1	w	1	d	JV	M	PHY	FDCV	WO	164		71
50	Southern and Baker, 1983	6368	Chicken (<i>Gallus domesticus</i>)	3	U	FD	14	d	8	d	JV	M	PHY	FDCV	WO	177	354	79
51	Oh et al, 1979	6627	Chicken (<i>Gallus domesticus</i>)	6	U	FD	4	w	1	d	JV	NR	PHY	FDCV	WO	252	503	75
52	Lu and Combs, 1988	5903	Chicken (<i>Gallus domesticus</i>)	2	U	FD	8	d	1	d	JV	NR	PHY	DIFD	WO		21.6	68
53	Roberson and Schaible, 1960	14538	Chicken (<i>Gallus domesticus</i>)	3	U	FD	4	w	1	d	JV	M	PHY	FDCV	WO		74.7	73
54	Bafundo et al, 1984	2517	Chicken (<i>Gallus domesticus</i>)	2	U	FD	14	d	8	d	JV	M	PHY	FDCV	WO		284	72
55	Bartov, 1996	5373	Chicken (<i>Gallus domesticus</i>)	4	U	FD	2	w	1	w	JV	F	PHY	FDCV	WO		315	69
56	Bartov, 1996	5373	Chicken (<i>Gallus domesticus</i>)	4	U	FD	2	w	1	w	JV	F	PHY	FDCV	WO		1370	69
Pathology (PTH)																		
57	Jackson et al, 1986	6133	Chicken (<i>Gallus domesticus</i>)	6	U	FD	140	d	40	w	SM	F	ORW	ORWT	SP	55	105	75
58	Lefevre et al, 1982	392	Chicken (<i>Gallus domesticus</i>)	2	U	FD	5	w	1	d	JV	NR	ORW	ORWT	LU	63.2		67
59	Gibson et al, 1986	6048	Chicken (<i>Gallus domesticus</i>)	6	U	FD	10	w	30	w	JV	F	ORW	SMIX	LI	75.1	91.6	75
60	Gibson et al, 1986	6048	Chicken (<i>Gallus domesticus</i>)	6	U	FD	10	w	30	w	JV	F	ORW	SMIX	LI	120	128	75

Table 5.1
Avian Toxicity Data Extracted for Wildlife Toxicity Reference Value (TRV)
Zinc
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Result #	Reference	Ref No.	Test Organism	# of Conc/ Doses	Method of Analyses	Route of Exposure	Exposure Duration	Duration Units	Age	Age Units	Lifestage	Sex	Effect Type	Effect Measure	Response Site	NOEL Dose* (mg/kg bw/day)	LOAEL Dose* (mg/kg bw/day)	Total
61	Stevenson et al, 1987	8184	Chicken (<i>Gallus domesticus</i>)	9	U	FD	140	d	28	w	JV	F	ORW	SMIX	GZ	125	167	75
62	Stevenson et al, 1987	8184	Chicken (<i>Gallus domesticus</i>)	9	U	FD	140	d	28	w	JV	F	ORW	SMIX	GZ	129	194	75
63	Stahl et al, 1989	5820	Chicken (<i>Gallus domesticus</i>)	2	U	FD	20	d	1	d	JV	B	ORW	SMIX	LI		31.0	73
30	Stahl et al, 1989	5820	Chicken (<i>Gallus domesticus</i>)	2	U	FD	20	d	1	d	JV	B	ORW	SMIX	LI		35.4	73
64	Lu and Combs, 1988	5903	Chicken (<i>Gallus domesticus</i>)	2	U	FD	8	d	1	d	JV	NR	HIS	GHIS	PS		41.7	68
65	Dewar et al, 1983	37018	Chicken (<i>Gallus domesticus</i>)	4	U	FD	4	w	1	d	JV	B	HIS	USTR	GZ		65.6	69
66	Jackson et al, 1986	6133	Chicken (<i>Gallus domesticus</i>)	5	U	FD	3	w	40	w	SM	F	ORW	ORWT	LI		88	69
67	Gasaway and Buss, 1972	9261	Mallard duck (<i>Anas platyrhynchos</i>)	4	U	FD	10	d	7	w	JV	B	ORW	SMIX	AR		126	73
68	Dewar et al, 1983	37018	Chicken (<i>Gallus domesticus</i>)	4	U	FD	4	w	2	w	JV	B	HIS	USTR	GZ		143	68
69	Dewar et al, 1983	37018	Chicken (<i>Gallus domesticus</i>)	3	U	FD	4	d	18	mo	AD	F	HIS	USTR	GZ		159	69
70	Dean et al, 1991	5681	Chicken (<i>Gallus domesticus</i>)	2	M	FD	4	w	1	d	JV	M	HIS	GHIS	TY		199	74
71	Jackson et al, 1986	6133	Chicken (<i>Gallus domesticus</i>)	5	U	FD	3	w	40	w	SM	F	ORW	ORWT	SP		367	69
72	Van Vleet et al, 1981	80	Duck (<i>Anas platyrhynchos</i>)	2	U	FD	15	d	1	d	JV	M	HIS	NCRO	PS		401	72
73	Van Vleet et al, 1981	80	Duck (<i>Anas platyrhynchos</i>)	2	U	FD	15	d	1	d	JV	M	HIS	NCRO	PS		803	72
74	Berry and Brake, 1990	7089	Chicken (<i>Gallus domesticus</i>)	2	U	FD	49	d	66	w	LB	F	ORW	SMIX	DT		988	67
Reproduction (REP)																		
75	Kaya et al, 2001	48543	Chicken (<i>Gallus domesticus</i>)	5	U	FD	12	w	NR	NR	LB	F	REP	PROG	WO	13.8		75
76	Schisler and Kienholz, 1967	8798	Chicken (<i>Gallus domesticus</i>)	2	U	FD	14	w	48	w	LB	F	REP	PROG	WO	14.4		70
77	Jensen and Maurice, 1980	9749	Chicken (<i>Gallus domesticus</i>)	3	U	FD	6	w	NR	NR	LB	F	REP	PROG	WO	24.7	98.8	82
78	Jackson et al, 1986	6133	Chicken (<i>Gallus domesticus</i>)	6	U	FD	140	d	40	w	LB	F	REP	PROG	WO	55	105	81
79	Gibson et al, 1986	6048	Chicken (<i>Gallus domesticus</i>)	6	U	FD	10	w	30	w	JV	F	REP	PROG	WO	57.3	66.5	81
80	Stevenson et al, 1987	8184	Chicken (<i>Gallus domesticus</i>)	9	U	FD	140	d	28	w	JV	F	REP	PROG	WO	63.9	76.7	81
81	Gibson et al, 1986	6048	Chicken (<i>Gallus domesticus</i>)	6	U	FD	10	w	30	w	LB	F	REP	PROG	WO	64.1	123	81
82	Stevenson et al, 1987	8184	Chicken (<i>Gallus domesticus</i>)	9	U	FD	140	d	28	w	LB	F	REP	PROG	WO	67.8	84.8	81
83	Stahl, et al, 1990	5764	Chicken (<i>Gallus domesticus</i>)	4	U	FD	12	w	56	w	LB	F	REP	PROG	WO	106		71
84	Gasaway and Buss, 1972	9261	Mallard duck (<i>Anas platyrhynchos</i>)	4	U	FD	60	d	7	w	JV	M	REP	TEWT	TE		31.2	79
85	Jackson et al, 1986	6133	Chicken (<i>Gallus domesticus</i>)	5	U	FD	1	w	40	w	SM	F	REP	PROG	WO		88	75
86	Jensen and Maurice, 1980	9749	Chicken (<i>Gallus domesticus</i>)	2	U	FD	6	w	NR	NR	LB	F	REP	PROG	WO		101	79
87	Stepinska et al, 1987	5770	Chicken (<i>Gallus domesticus</i>)	2	U	FD	5	d	71	w	LB	F	REP	PROG	WO		205	75
88	Jackson et al, 1986	6133	Chicken (<i>Gallus domesticus</i>)	5	U	FD	1	w	40	w	LB	F	REP	PROG	WO		367	75
89	Berry and Brake, 1985	6144	Chicken (<i>Gallus domesticus</i>)	2	U	FD	4	d	60	w	LB	F	REP	RHIS	OD		988	73
90	Berry and Brake, 1990	7089	Chicken (<i>Gallus domesticus</i>)	2	U	FD	49	d	66	w	LB	F	REP	RHIS	OD		988	73
Growth (GRO)																		
91	Schisler and Kienholz, 1967	8798	Chicken (<i>Gallus domesticus</i>)	2	U	FD	14	w	48	w	JV	F	GRO	BDWT	WO	14.4		68
92	Baker and Halpin, 1988	5917	Chicken (<i>Gallus domesticus</i>)	2	M	FD	14	d	8	d	JV	M	GRO	BDWT	WO	15.0		73
93	Mohanna and Nys, 1999	5090	Chicken (<i>Gallus domesticus</i>)	2	U	FD	16	d	5	d	JV	NR	GRO	BDWT	WO	16.1		68
94	Hamilton et al, 1979	6655	Japanese quail (<i>Coturnix japonica</i>)	2	U	FD	14	d	0	d	JV	B	GRO	BDWT	WO	21.5		80
95	Hill, 1974	1369	Chicken (<i>Gallus domesticus</i>)	2	U	FD	3	w	1	d	JV	B	GRO	BDWT	WO	28.7		76
96	Stahl et al, 1989	5820	Chicken (<i>Gallus domesticus</i>)	2	U	FD	20	d	1	d	JV	B	GRO	BDWT	WO	35.4		68
97	Hill, 1990	5734	Chicken (<i>Gallus domesticus</i>)	2	U	FD	19	d	1	d	JV	F	GRO	BDWT	WO	36.6		76
98	Hamilton et al, 1981	6403	Japanese quail (<i>Coturnix japonica</i>)	3	U	FD	14	d	1	d	JV	B	GRO	BDWT	WO	43.3	86.6	83
99	Jackson et al, 1986	6133	Chicken (<i>Gallus domesticus</i>)	6	U	FD	140	d	40	w	SM	F	GRO	BDWT	WO	55.0	105	79
100	Harland et al, 1975	6887	Japanese quail (<i>Coturnix japonica</i>)	2	U	FD	1	w	1	d	JV	B	GRO	BDWT	WO	55.1		77
101	Berg and Martinson, 1972	93	Chicken (<i>Gallus domesticus</i>)	7	U	FD	2	w	1	d	JV	NR	GRO	BDWT	WO	55.3	111	78
102	Lefevre et al, 1982	392	Chicken (<i>Gallus domesticus</i>)	2	U	FD	5	w	1	d	JV	NR	GRO	BDWT	WO	63.2		76
103	Sandoval et al, 1998	7245	Chicken (<i>Gallus domesticus</i>)	4	U	FD	3	w	1	d	JV	M	GRO	BDWT	WO	70.6	106	84
104	Roberson and Schaible, 1960	14538	Chicken (<i>Gallus domesticus</i>)	3	U	FD	4	w	1	d	JV	M	GRO	BDWT	WO	74.3	111	83
105	Roberson and Schaible, 1960	14538	Chicken (<i>Gallus domesticus</i>)	3	U	FD	4	w	1	d	JV	M	GRO	BDWT	WO	74.7	112	83
106	Roberson and Schaible, 1960	14538	Chicken (<i>Gallus domesticus</i>)	4	U	FD	4	w	1	d	JV	M	GRO	BDWT	WO	75.0	150	79
107	Roberson and Schaible, 1960	14538	Chicken (<i>Gallus domesticus</i>)	3	U	FD	4	w	1	d	JV	M	GRO	BDWT	WO	75.7	114	83
108	Hill, 1974	92	Chicken (<i>Gallus domesticus</i>)	5	U	FD	2	w	1	d	JV	B	GRO	BDWT	WO	85.9	172	82
109	Hamilton et al, 1979	6655	Japanese quail (<i>Coturnix japonica</i>)	6	U	FD	14	d	8	d	JV	B	GRO	BDWT	WO	86.8	174	86
110	Henry et al, 1987	6039	Chicken (<i>Gallus domesticus</i>)	4	U	FD	1	w	1	d	JV	M	GRO	BDWT	WO	92.3	185	83
111	Gibson et al, 1986	6048	Chicken (<i>Gallus domesticus</i>)	6	U	FD	10	w	30	w	JV	F	GRO	BDWT	WO	96.9	145	79
112	Stevenson et al, 1987	8184	Chicken (<i>Gallus domesticus</i>)	9	U	FD	140	d	28	w	JV	F	GRO	BDWT	WO	99.1	149	79
113	Sandoval et al, 1999	5067	Chicken (<i>Gallus domesticus</i>)	2	U	FD	7	d	14	d	JV	M	GRO	BDWT	WO	103		68
114	Sandoval et al, 1999	5067	Chicken (<i>Gallus domesticus</i>)	2	U	FD	7	d	14	d	JV	M	GRO	BDWT	WO	103		68
115	Stahl, et al, 1990	5764	Chicken (<i>Gallus domesticus</i>)	3	U	FD	44	w	24	w	LB	F	GRO	BDWT	WO	129		69
116	Stevenson et al, 1987	8184	Chicken (<i>Gallus domesticus</i>)	9	U	FD	140	d	28	w	LB	F	GRO	BDWT	WO	129	194	79
117	Bafundo et al, 1984	2517	Chicken (<i>Gallus domesticus</i>)	2	U	FD	14	d	8	d	JV	F	GRO	BDWT	WO	142		67
118	Dewar et al, 1983	37018	Chicken (<i>Gallus domesticus</i>)	4	U	FD	4	w	1	d	JV	B	GRO	BDWT	WO	143	286	79
119	Vohra and Kratzer, 1968	14404	Turkey (<i>Meleagris gallopavo</i>)	7	U	FD	21	d	NR	NR	JV	B	GRO	BDWT	WO	148	297	77
120	Roberson and Schaible, 1960	14538	Chicken (<i>Gallus domesticus</i>)	4	U	FD	4	w	1	d	JV	M	GRO	BDWT	WO	155	232	83

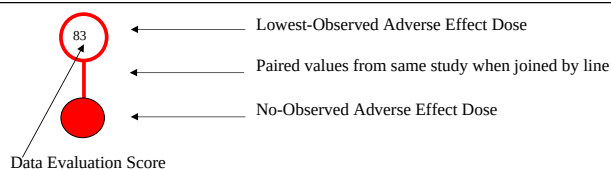
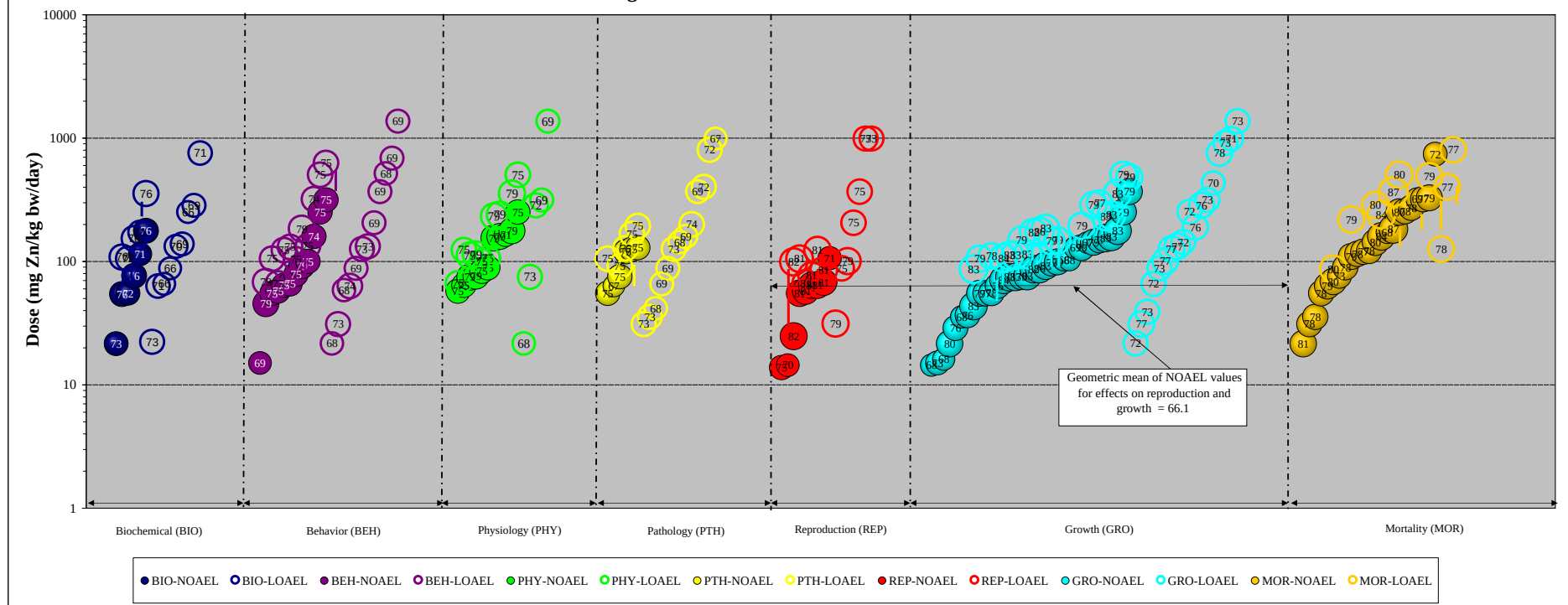
Table 5.1
Avian Toxicity Data Extracted for Wildlife Toxicity Reference Value (TRV)
Zinc
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Result #	Reference	Ref No.	Test Organism	# of Conc/ Doses	Method of Analyses	Route of Exposure	Exposure Duration	Duration Units	Age	Age Units	Lifestage	Sex	Effect Type	Effect Measure	Response Site	NOAEL Dose* (mg/kg bw/day)	LOAEL Dose* (mg/kg bw/day)	Total
121	Roberson and Schaible, 1960	14538	Chicken (<i>Gallus domesticus</i>)	4	U	FD	4	w	1	d	JV	M	GRO	BDWT	WO	158	237	83
122	Southern and Baker, 1983	6368	Chicken (<i>Gallus domesticus</i>)	3	U	FD	14	d	8	d	JV	M	GRO	BDWT	WO	177	354	83
123	Oh et al, 1979	6627	Chicken (<i>Gallus domesticus</i>)	6	U	FD	4	w	1	d	JV	NR	GRO	BDWT	WO	252	503	79
124	Jackson et al, 1986	6133	Chicken (<i>Gallus domesticus</i>)	5	U	FD	1	w	40	w	SM	F	GRO	BDWT	WO	367	480	79
125	Lu and Combs, 1988	5903	Chicken (<i>Gallus domesticus</i>)	2	U	FD	15	d	1	d	JV	NR	GRO	BDWT	WO		21.6	72
126	Stahl et al, 1989	5820	Chicken (<i>Gallus domesticus</i>)	2	U	FD	20	d	1	d	JV	B	GRO	BDWT	WO		31.0	77
127	Lu and Combs, 1988	5866	Chicken (<i>Gallus domesticus</i>)	2	U	FD	6	d	20	d	JV	NR	GRO	BDWT	WO		39.0	73
128	Lu et al, 1990	8008	Chicken (<i>Gallus domesticus</i>)	2	U	FD	7	d	14	d	JV	B	GRO	BDWT	WO		65.7	72
129	Jackson et al, 1986	6133	Chicken (<i>Gallus domesticus</i>)	5	U	FD	21	d	40	w	SM	F	GRO	BDWT	WO		88	73
130	Jensen and Maurice, 1980	9749	Chicken (<i>Gallus domesticus</i>)	2	U	FD	6	w	NR	NR	SM	F	GRO	BDWT	WO		101	77
131	Gasaway and Buss, 1972	9261	Mallard duck (<i>Anas platyrhynchos</i>)	4	U	FD	10	d	7	w	JV	B	GRO	BDWT	WO		126	77
132	Pimentel et al, 1992	5617	Chicken (<i>Gallus domesticus</i>)	2	M	FD	3	w	1	d	JV	B	GRO	BDWT	WO		132	77
133	Dewar et al, 1983	37018	Chicken (<i>Gallus domesticus</i>)	4	U	FD	4	w	2	w	JV	B	GRO	BDWT	WO		143	72
134	Berg and Martinson, 1972	93	Chicken (<i>Gallus domesticus</i>)	2	U	FD	2	w	1	d	JV	NR	GRO	BDWT	WO		252	72
135	Bafundo et al, 1984	6273	Chicken (<i>Gallus domesticus</i>)	2	U	FD	14	d	8	d	JV	M	GRO	BDWT	WO		190	76
136	Bafundo et al, 1984	2517	Chicken (<i>Gallus domesticus</i>)	2	U	FD	14	d	8	d	JV	M	GRO	BDWT	WO		284	76
137	Bartov, 1996	5373	Chicken (<i>Gallus domesticus</i>)	4	U	FD	2	w	1	w	JV	F	GRO	BDWT	WO		315	73
138	Rama and Planas, 1981	6435	Chicken (<i>Gallus domesticus</i>)	2	U	FD	9	w	1	d	JV	NR	GRO	BDWT	WO		433	70
139	Dean et al, 1991	5681	Chicken (<i>Gallus domesticus</i>)	2	M	FD	1	w	1	d	JV	M	GRO	BDWT	WO		757	78
140	Bartov et al, 1994	7956	Chicken (<i>Gallus domesticus</i>)	3	U	FD	2	w	1	w	JV	F	GRO	BDWT	WO		914	73
141	Palafox and Ho-A, 1980	6545	Chicken (<i>Gallus domesticus</i>)	2	U	FD	5	d	38	w	JV	F	GRO	BDWT	WO		988	71
142	Bartov, 1996	5373	Chicken (<i>Gallus domesticus</i>)	4	U	FD	2	w	1	w	JV	F	GRO	BDWT	WO		1370	73
Survival (MOR)																		
143	Hamilton et al, 1979	6655	Japanese quail (<i>Coturnix japonica</i>)	2	U	FD	14	d	0	d	JV	B	MOR	MORT	WO	21.5		81
144	Stahl et al, 1989	5820	Chicken (<i>Gallus domesticus</i>)	2	U	FD	20	d	1	d	JV	B	MOR	MORT	WO	31.0		78
145	Stahl et al, 1989	5820	Chicken (<i>Gallus domesticus</i>)	2	U	FD	20	d	1	d	JV	B	MOR	MORT	WO	35.4		78
146	Harland et al, 1975	6887	Japanese quail (<i>Coturnix japonica</i>)	2	U	FD	1	w	1	d	JV	B	MOR	MORT	WO	55.1		78
147	Lefevre et al, 1982	392	Chicken (<i>Gallus domesticus</i>)	2	U	FD	5	w	1	d	JV	NR	MOR	MORT	WO	63.2		79
148	Gibson et al, 1986	6048	Chicken (<i>Gallus domesticus</i>)	6	U	FD	10	w	30	w	JV	F	MOR	MORT	WO	68.8	87.1	80
149	Roberson and Schaible, 1960	14538	Chicken (<i>Gallus domesticus</i>)	10	U	FD	4	w	1	w	JV	M	MOR	SURV	WO	75.6		73
150	Hamilton et al, 1981	6403	Japanese quail (<i>Coturnix japonica</i>)	3	U	FD	14	d	1	d	JV	B	MOR	MORT	WO	89.5		78
151	Blalock and Hill, 1988	5868	Chicken (<i>Gallus domesticus</i>)	3	U	FD	12	d	1	d	JV	F	MOR	MORT	WO	109	219	79
152	Roberson and Schaible, 1960	14538	Chicken (<i>Gallus domesticus</i>)	3	U	FD	4	w	1	d	JV	M	MOR	SURV	WO	115		78
153	Roberson and Schaible, 1960	14538	Chicken (<i>Gallus domesticus</i>)	3	U	FD	4	w	1	d	JV	M	MOR	SURV	WO	120		77
154	Roberson and Schaible, 1960	14538	Chicken (<i>Gallus domesticus</i>)	3	U	FD	4	w	1	d	JV	M	MOR	SURV	WO	121		78
155	Dewar et al, 1983	37018	Chicken (<i>Gallus domesticus</i>)	4	U	FD	4	w	1	d	JV	B	MOR	MORT	WO	143	286	80
156	Roberson and Schaible, 1960	14538	Chicken (<i>Gallus domesticus</i>)	4	U	FD	4	w	1	d	JV	M	MOR	SURV	WO	159	239	84
157	Hill, 1974	92	Chicken (<i>Gallus domesticus</i>)	5	U	FD	5	w	1	d	JV	B	MOR	MORT	WO	172		68
158	Hamilton et al, 1979	6655	Japanese quail (<i>Coturnix japonica</i>)	6	U	FD	14	d	0	d	JV	B	MOR	MORT	WO	183	366	87
159	Oh et al, 1979	6627	Chicken (<i>Gallus domesticus</i>)	6	U	FD	4	w	1	d	JV	NR	MOR	MORT	WO	252	503	80
160	Roberson and Schaible, 1960	14538	Chicken (<i>Gallus domesticus</i>)	4	U	FD	4	w	1	d	JV	M	MOR	SURV	WO	255		78
161	Roberson and Schaible, 1960	14538	Chicken (<i>Gallus domesticus</i>)	4	U	FD	4	w	1	d	JV	M	MOR	SURV	WO	272		78
162	Dewar et al, 1983	37018	Chicken (<i>Gallus domesticus</i>)	3	U	FD	4	d	18	mo	AD	F	MOR	MORT	WO	319		69
163	Hill, 1974	1369	Chicken (<i>Gallus domesticus</i>)	2	U	FD	3	w	1	d	JV	B	MOR	MORT	WO	320		77
164	Dewar et al, 1983	37018	Chicken (<i>Gallus domesticus</i>)	4	U	FD	4	w	2	w	JV	B	MOR	MORT	WO	327	491	79
165	Vohra and Kratzer, 1968	14404	Turkey (<i>Meleagris gallopavo</i>)	7	U	FD	21	d	NR	NR	JV	B	MOR	MORT	WO	741		72
166	Gasaway and Buss, 1972	9261	Mallard duck (<i>Anas platyrhynchos</i>)	4	U	FD	30	d	7	w	JV	B	MOR	MORT	WO		126	78
167	Van Vleet et al, 1981	80	Duck (<i>Anas platyrhynchos</i>)	2	U	FD	15	d	1	d	JV	M	MOR	MORT	WO		401	77
168	Van Vleet et al, 1981	80	Duck (<i>Anas platyrhynchos</i>)	2	U	FD	15	d	1	d	JV	M	MOR	MORT	WO		803	77

AD = adult; AR = adrenal gland ; ASHC = ash content; AT = alimentary tract; B = both; BDWT = body weight changes; BEH = behavior; BIO = biochemical; BL = blood; BO = bone; w = body weight; CHM = chemical changes; d = day; DIFD = digestibility of food; DT = digestive tract; ENZ = enzyme level changes; F = female; FCNS = food consumption; FD = food; FDB = feeding behavior; FDCV = food conversion efficiency; FDNG = feeding behavior; GBCM = general biochemical ; GENZ = general enzyme changes; GHIS = general histology; GRO = growth; GZ = gizzard; HIS = histological changes; HMCT = hematocrit; HMGL = hemoglobin; ITX = intoxication; JV = juvenile; kg = kilograms; LB = egg-laying bird; LI = liver; LIPD = lipid; LOAEL = lowest observed adverse effect level; LU = lung; mg = milligrams; mo = months; M = male; M = measured; MCPR = microsomal proteins; MOR = effects on mortality and survival; MORT = mortality; NCRO = necrosis; NOAEL = No Observed Adverse Effect Level; NR = Not reported; OD = oviduct; ORW = organ weight changes; ORWT = organ weight changes; PHY = physiology; PROG = progeny counts/numbers; PS = pancreas; PTH = pathology; REP = reproduction; RHIS = reproductive organ histology; SM = sexually mature; SMIX = weight relative to body weight; SP = spleen; SR = serum; SURV = survival; TE = testes; TEWT = ultrastructural changes; w = weeks; WI = wings; WO = whole organism; yr = year.

*NOAEL and LOAEL values that are equal and from the same reference represent different experimental designs.

Figure 5.1 Avian TRV Derivation for Zinc



Wildfire TRV Derivation Process

- 1) There are at least three results available for two test species within the growth, reproduction, and mortality effect groups.
There are enough data to derive a TRV.
- 2) There are at least three NOAEL results available within the growth and reproduction effect groups for calculation of a geometric mean.
- 3) The geometric mean is equal to 66.1 mg zinc/kg bw/d. This value is lower than the lowest bounded LOAEL for results within the reproduction, growth, and survival (MOR) effect groups.
- 3) The avian wildlife TRV for zinc is equal to 66.1 mg zinc/kg bw/day which is the geometric mean of NOAEL values for effects on reproduction and growth.

5.2 Estimation of Dose and Calculation of the Eco-SSL

Three separate Eco-SSL values were calculated for avian wildlife, one for each of three surrogate receptor species representing different trophic levels. The avian Eco-SSLs were calculated according to the Eco-SSL guidance (U.S. EPA, 2003) and are summarized in Table 5.2.

Table 5.2 Calculation of the Avian Eco-SSLs for Zinc					
Surrogate Receptor Group	TRV for Zinc (mg dw/kg bw/d) ¹	Food Ingestion Rate (FIR) ² (kg dw/kg bw/d)	Soil Ingestion as Proportion of Diet (P _s) ²	Concentration of Zinc in Biota Type (i) ^{2,3} (B _i) (mg/kg dw)	Eco-SSL (mg/kg dw) ⁴
Avian herbivore (dove)	66.1	0.190	0.139	$\ln(B_i) = 0.554 * \ln(\text{Soil}_i) + 1.575$ where i = plants	950
Avian ground insectivore (woodcock)	66.1	0.214	0.164	$\ln(B_i) = 0.328 * \ln(\text{Soil}_i) + 4.449$ where i = earthworms	46
Avian carnivore (hawk)	66.1	0.0353	0.057	$\ln(B_i) = 0.0706 * \ln(\text{Soil}_i) + 4.3632$ where i = mammals	30,000
¹ The process for derivation of wildlife TRVs is described in Attachment 4-5 of U.S. EPA (2003). ² Parameters (FIR, P _s , B _i values, regressions) are provided in U.S. EPA (2003) Attachment 4-1 (revised February 2005). ³ B _i = Concentration in biota type (i) which represents 100% of the diet for the respective receptor. ⁴ HQ = [FIR * (Soil _i * P _s + B _i)] / TRV solved for HQ=1 where Soil _i = Eco-SSL (Equation 4-2; U.S. EPA, 2003).					

6.0 ECO-SSL FOR MAMMALIAN WILDLIFE

The derivation of the Eco-SSL for mammalian wildlife was completed as two parts. First, the TRV was derived according to the Eco-SSL guidance (U.S. EPA, 2003; Attachment 4-5). Second, the Eco-SSL (soil concentration) was back-calculated for each of three surrogate receptor species based on the wildlife exposure model and the TRV (U.S. EPA, 2003).

6.1 Mammalian TRV

The literature search was completed according to the Eco-SSL guidance (U.S. EPA, 2003; Attachment 4-2) and identified 10,410 papers with possible toxicity data for zinc for either avian or mammalian species. Of these studies, 10,259 were rejected for use as described in Section 7.5. Of the remaining papers, 99 contained data for mammalian test species. These papers were reviewed and the data were extracted and scored according to the Eco-SSL guidance (U.S. EPA, 2003; Attachment 4-3 and 4-4). The results of the data extraction and review are summarized in Table 6.1. The complete results are provided as Appendix 6-1.

Table 6.1 Mammalian Toxicity Data Extracted for Wildlife Toxicity Reference Value (TRV)

Zinc

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Result #	Reference	Ref No.	Test Organism	# of Conc/ Doses	Method of Analyses	Route of Exposure	Exposure Duration	Duration Units	Age	Age Units	Lifestage	Sex	Effect Type	Effect Measure	Response Site	NOEL Dose* (mg/kg bw/day)	LOEL Dose* (mg/kg bw/day)	Total
Biochemical (BIO)																		
1	Brandt, 1983	2033	Mink (<i>Mustela vison</i>)	3	M	FD	4	mo	90	d	JV	M	CHM	MCHC	PL	10.4	20.1	81
2	Van der Schee et al, 1980	21171	Sheep (<i>Ovis aries</i>)	3	M	FD	98	d	NR	NR	JV	M	CHM	HMCT	BL	12		66
3	Hill and Miller, 1983	45270	Pig (<i>Sus scrofa</i>)	3	U	FD	4	w	NR	NR	GE	F	ENZ	ALPH	SR	25.0	250	70
4	Reeves and Newman, 1997	21067	Rat (<i>Rattus norvegicus</i>)	2	U	FD	7	w	21	d	JV	M	CHM	HMCT	BL	30.4		72
5	Gaynor et al, 1988	47892	Cattle (<i>Bos taurus</i>)	2	M	FD	4	w	NR	NR	LC	F	CHM	PRTL	MK	30.6		67
6	Mengo et al., 1991	21240	Rat (<i>Rattus norvegicus</i>)	3	U	FD	3	mo	1	mo	JV	M	CHM	CHOL	BL	32.1	96.4	70
7	Gaynor et al, 1988	47892	Cattle (<i>Bos taurus</i>)	2	M	FD	5	w	NR	NR	LC	F	CHM	PRTL	MK	33.2		67
8	Brzoska et al, 2001	36302	Rat (<i>Rattus norvegicus</i>)	2	U	DR	12	w	2	mo	JV	M	CHM	CALC	TB	40.0		72
9	Ott et al., 1966	14536	Cattle (<i>Bos taurus</i>)	6	U	FD	12	w	NR	NR	JV	B	CHM	PCLV	BL	42.6	55.7	71
10	Brink et al, 1959	14525	Pig (<i>Sus scrofa</i>)	6	U	FD	42	d	NR	NR	JV	NR	CHM	HMGL	BL	43.5	87.1	77
11	Ott et al., 1966	14537	Sheep (<i>Ovis aries</i>)	8	U	FD	7	w	NR	NR	JV	M	CHM	PCLV	BL	51.2	68.3	72
12	Ott et al., 1966	14537	Sheep (<i>Ovis aries</i>)	4	U	GV	11	d	NR	NR	JV	M	CHM	HMGL	BL	53.2	106	75
13	Bentley and Grubb, 1991	40436	Rabbit (<i>Oryctolagus cuniculus</i>)	3	U	FD	22	w	NR	NR	JV	B	CHM	HMGL	BL	56.5	282	74
14	Maita et al, 1981	43680	Rat (<i>Rattus norvegicus</i>)	4	U	FD	13	w	5	w	JV	M	CHM	HMGL	BL	234	2514	73
15	Maita et al, 1981	43680	Rat (<i>Rattus norvegicus</i>)	4	U	FD	13	w	5	w	JV	F	CHM	HEMT	BL	243	2486	73
16	Whanger and Weswig, 1970	22300	Rat (<i>Rattus norvegicus</i>)	4	U	FD	10	w	21	d	JV	M	CHM	GBCM	BL	356	711	75
17	Maita et al, 1981	43680	Mouse (<i>Mus musculus</i>)	4	U	FD	13	w	5	w	JV	M	CHM	HMGL	BL	458	4927	73
18	Maita et al, 1981	43680	Mouse (<i>Mus musculus</i>)	4	U	FD	13	w	5	w	JV	F	CHM	HMGL	BL	479	4878	73
19	O'Neil-Cutting et al, 1981	14656	Rat (<i>Rattus norvegicus</i>)	2	U	FD	18	w	NR	NR	JV	M	CHM	HMGL	BL	597		70
20	Urabe and Hayakawa, 1990	40997	Rat (<i>Rattus norvegicus</i>)	2	U	FD	42	d	NR	NR	JV	M	CHM	PRTL	LI	1684		71
21	Nakamura et al., 1983	638	Rat (<i>Rattus norvegicus</i>)	2	U	FD	11	w	NR	NR	JV	F	CHM	GLUC	SR		8.71	66
22	L'Abbe and Fischer, 1984	36982	Rat (<i>Rattus norvegicus</i>)	3	M	FD	6	w	NR	NR	JV	M	CHM	GBCM	SR		10.7	74
23	Elliot and Walker, 1968	38623	Pig (<i>Sus scrofa</i>)	2	U	FD	4	w	NR	NR	JV	B	CHM	HMGL	WO		14.9	70
24	L'Abbe and Fischer, 1984	36983	Rat (<i>Rattus norvegicus</i>)	2	U	FD	2	w	NR	NR	JV	M	ENZ	CCOX	LI		21.6	69
25	Subramanian et al, 2000	21011	Rat (<i>Rattus norvegicus</i>)	2	U	FD	6	w	NR	NR	JV	M	CHM	HMGL	PL		28.2	66
26	Shankar et al, 1986	46830	Rat (<i>Rattus norvegicus</i>)	2	U	FD	120	d	40	d	JV	F	CHM	CHOL	SR		28.9	66
27	Tran, et. al, 1999	21015	Rat (<i>Rattus norvegicus</i>)	3	U	FD	7	d	NR	NR	JV	M	CHM	MCPR	IN		35.2	70
28	Kadiiska et al, 1985	19290	Rat (<i>Rattus norvegicus</i>)	2	U	DR	30	d	NR	NR	JV	M	ENZ	P450	LI		40.5	69
29	Reeves et al, 1994	37015	Rat (<i>Rattus norvegicus</i>)	2	U	FD	2	w	NR	NR	JV	M	CHM	GBCM	LI		56	68
30	Van Vleet et al, 1981	149	Pig (<i>Sus scrofa</i>)	2	U	FD	2	w	NR	NR	JV	M	ENZ	GLPX	BL		99.1	70
31	Yamaguchi et al, 1982	37010	Rat (<i>Rattus norvegicus</i>)	3	U	OR	30	d	3	w	JV	M	CHM	CALC	SR		100	72
32	Tantcheva et al, 1993	39802	Rat (<i>Rattus norvegicus</i>)	2	U	DR	30	d	NR	NR	JV	M	ENZ	AHDX	LI		100	69
33	Jaw and Jeffery, 1988	36967	Rat (<i>Rattus norvegicus</i>)	2	U	FD	8	d	NR	NR	JV	F	CHM	GBCM	LI		103	70
34	Hsu et al, 1975	14376	Pig (<i>Sus scrofa</i>)	2	U	FD	2	w	4	w	JV	NR	ENZ	ALPH	SR		354	66
35	Thawley, et. al., 1978	36953	Rat (<i>Rattus norvegicus</i>)	2	U	FD	6	w	NR	NR	JV	M	CHM	HMGL	BL		578	70
36	Settlemyre and Matrone, 1967	38015	Rat (<i>Rattus norvegicus</i>)	2	U	FD	5	w	4-6	w	JV	M	CHM	HMGL	BL		667	69
37	Ogiso, et. al., 1974	42961	Rat (<i>Rattus norvegicus</i>)	2	U	FD	15	d	NR	NR	JV	M	CHM	HMGL	BL		956	70
38	Scott and Magee, 1979	43264	Rat (<i>Rattus norvegicus</i>)	2	U	FD	1	w	NR	NR	JV	B	CHM	HMGL	BL		968	70
39	Pettersen, et al, 2002	36374	Mouse (<i>Mus musculus</i>)	3	U	FD	3	w	4	w	JV	B	CHM	NACO	HE		1419	70
40	Gautam et al, 2001	36346	Rat (<i>Rattus norvegicus</i>)	2	U	FD	2	w	NR	NR	JV	NR	CHM	CALC	LI		1782	69
41	Rana et. al, 1985	13236	Rat (<i>Rattus norvegicus</i>)	2	U	GV	30	d	90	d	JV	M	CHM	GLYC	LI		5000	72
Behavior (BEH)																		
42	Shankar et al, 1986	46830	Rat (<i>Rattus norvegicus</i>)	2	U	FD	120	d	40	d	JV	F	FDB	FCNS	WO	28.9		69
43	Gaynor et al, 1988	47892	Cattle (<i>Bos taurus</i>)	2	M	FD	4	w	NR	NR	LC	F	FDB	FCNS	WO	30.6		70
44	Gaynor et al, 1988	47892	Cattle (<i>Bos taurus</i>)	2	M	FD	5	w	NR	NR	LC	F	FDB	FCNS	WO	33.2		70
45	Henry et al, 1997	40409	Sheep (<i>Ovis aries</i>)	6	U	FD	3	d	NR	NR	JV	M	FDB	FCNS	WO	34.9	46.5	80
46	Miller et al., 1989	14685	Cattle (<i>Bos taurus</i>)	3	U	FD	10	w	NR	NR	LC	F	FDB	FCNS	WO	38.3	76.5	80
47	Ott et al, 1966	14535	Sheep (<i>Ovis aries</i>)	8	U	FD	6	w	NR	NR	JV	NR	FDB	FDNG	WO	38.6	57.9	75
48	Brink et al, 1959	14525	Pig (<i>Sus scrofa</i>)	6	U	FD	42	d	NR	mo	JV	NR	FDB	FCNS	WO	47.5	94.9	80
49	Schell and Kornegay, 1996	42234	Pig (<i>Sus scrofa</i>)	4	M	FD	2	w	23	d	JV	B	FDB	FCNS	WO	106		70
50	Aulerich et al, 1991	46274	Mink (<i>Mustela vison</i>)	4	M	FD	144	d	>1	yr	AD	M	FDB	FCNS	WO	165		79
51	Maita et al, 1981	43680	Rat (<i>Rattus norvegicus</i>)	4	U	FD	13	w	5	w	JV	M	FDB	FCNS	WO	234	2514	76
52	Aulerich et al, 1991	46274	Mink (<i>Mustela vison</i>)	4	M	FD	144	d	10-12	w	JV	M	FDB	FCNS	WO	297		77
53	Aulerich et al, 1991	46274	Mink (<i>Mustela vison</i>)	4	M	FD	144	d	10-12	w	JV	F	FDB	FCNS	WO	324		75
54	Aulerich et al, 1991	46274	Mink (<i>Mustela vison</i>)	4	M	FD	144	d	>1	yr	AD	F	FDB	FCNS	WO	327		75
55	Ketcheson et al, 1969	37837	Rat (<i>Rattus norvegicus</i>)	3	U	FD	14	d	NR	NR	LC	F	FDB	FCNS	WO	470		69
56	Urabe and Hayakawa, 1990	40997	Rat (<i>Rattus norvegicus</i>)	2	U	FD	42	d	NR	NR	JV	M	FDB	FCNS	WO	1684		74
57	Subramanian et al, 2000	21011	Rat (<i>Rattus norvegicus</i>)	2	U	FD	6	w	NR	NR	JV	M	FDB	FCNS	WO		28.2	69
58	Brzoska et al, 2001	36302	Rat (<i>Rattus norvegicus</i>)	2	U	DR	12	w	2	mo	JV	M	FDB	WCON	WO		40	75
Physiology (PHY)																		
59	Ott et al, 1966	14535	Sheep (<i>Ovis aries</i>)	8	U	FD	6	w	NR	NR	JV	NR	PHY	FDCV	WO	19.9	39.7	75

Table 6.1 Mammalian Toxicity Data Extracted for Wildlife Toxicity Reference Value (TRV)

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Result #	Reference	Ref No.	Test Organism	# of Conc/ Doses	Method of Analyses	Route of Exposure	Exposure Duration	Duration Units	Age	Age Units	Lifestage	Sex	Effect Type	Effect Measure	Response Site	NOEL Dose* (mg/kg bw/day)	LOAEL Dose* (mg/kg bw/day)	Total
60	Gaynor et al, 1988	47892	Cattle (<i>Bos taurus</i>)	2	M	FD	4	w	NR	mo	LC	F	PHY	FDCV	WO	30.6		70
61	Gaynor et al, 1988	47892	Cattle (<i>Bos taurus</i>)	2	M	FD	5	w	NR	NR	LC	F	PHY	FDCV	WO	33.2		70
62	Brink et al, 1959	14525	Pig (<i>Sus scrofa</i>)	6	U	FD	42	d	NR	NR	JV	NR	PHY	FDCV	WO	38.3	76.7	80
63	Schell and Kornegay, 1996	42234	Pig (<i>Sus scrofa</i>)	4	M	FD	2	w	23	d	JV	F	PHY	FDCV	WO	106		70
64	Maita et al, 1981	43680	Mouse (<i>Mus musculus</i>)	4	U	FD	13	w	5	w	JV	M	PHY	FDCV	WO	458	4927	72
65	Maita et al, 1981	43680	Mouse (<i>Mus musculus</i>)	4	U	FD	13	w	5	w	JV	F	PHY	FDCV	WO	479	4878	76
66	Urabe and Hayakawa, 1990	40997	Rat (<i>Rattus norvegicus</i>)	2	U	FD	42	d	NR	NR	JV	M	PHY	FDCV	WO	1684		74
67	Maita et al, 1981	43680	Rat (<i>Rattus norvegicus</i>)	4	U	FD	13	w	5	w	JV	M	PHY	FDCV	WO	2514		67
68	Mutafova-Yamolieva, et al, 1993	39780	Rat (<i>Rattus norvegicus</i>)	2	U	DR	30	d	NR	NR	JV	M	PHY	GPHY	VD		100	72
69	Cox and Hale, 1962	14526	Pig (<i>Sus scrofa</i>)	3	U	FD	69	d	NR	NR	JV	NR	PHY	FDCV	WO		134	66
Pathology (PTH)																		
70	Hill et. al., 1983	45143	Pig (<i>Sus scrofa</i>)	3	U	FD	12	mo	7-8	mo	GE	F	ORW	SMIX	LI	8.23	82.3	73
71	Ott et al., 1966	14537	Sheep (<i>Ovis aries</i>)	8	U	FD	7	w	NR	NR	JV	M	ORW	ORWT	LI	18.6	37.3	75
72	Reeves and Newman, 1997	21067	Rat (<i>Rattus norvegicus</i>)	2	U	FD	7	w	3	w	JV	M	HIS	USTR	IN	30.4		66
73	Brzoska et al, 2001	36302	Rat (<i>Rattus norvegicus</i>)	2	U	DR	12	w	2	mo	JV	M	ORW	ORWT	TB	40		75
74	Maita et al, 1981	43680	Rat (<i>Rattus norvegicus</i>)	4	U	FD	13	w	5	w	JV	M	ORW	ORWT	BR	234	2514	76
75	Maita et al, 1981	43680	Rat (<i>Rattus norvegicus</i>)	4	U	FD	13	w	5	w	JV	F	ORW	ORWT	LI	243	2486	76
76	Maita et al, 1981	43680	Mouse (<i>Mus musculus</i>)	4	U	FD	13	w	5	w	JV	M	ORW	ORWT	BR	458	4927	76
77	Maita et al, 1981	43680	Mouse (<i>Mus musculus</i>)	4	U	FD	13	w	5	w	JV	F	ORW	ORWT	BR	479	4878	76
78	O'Neil-Cutting et al, 1981	14656	Rat (<i>Rattus norvegicus</i>)	2	U	FD	18	w	NR	NR	JV	M	ORW	ORWT	LI	597		71
79	Urabe and Hayakawa, 1990	40997	Rat (<i>Rattus norvegicus</i>)	2	U	FD	42	d	NR	NR	JV	M	ORW	ORWT	LI	1684		71
80	Seidenberg et al 1986	113	Mouse (<i>Mus musculus</i>)	2	U	GV	4	d	NR	NR	GE	F	GRS	BDWT	WO		8.89	80
81	Augey, et al, 1977	14524	Mouse (<i>Mus musculus</i>)	2	U	DR	12	mo	1.5-2	mo	JV	B	HIS	USTR	PS		70.1	68
82	Davies, et al, 1977	14527	Sheep (<i>Ovis aries</i>)	2	M	FD	26	d	1	w	JV	M	ORW	ORWT	KI		75.7	77
83	Van Vleet et al, 1981	149	Pig (<i>Sus scrofa</i>)	2	U	FD	10	w	NR	NR	JV	M	HIS	GLSN	HE		99.1	73
84	Yamaguchi et al, 1982	37010	Rat (<i>Rattus norvegicus</i>)	3	U	OR	30	d	3	w	JV	M	ORW	ORWT	FM		100	75
85	Ferguson and Leaver, 1972	42635	Rat (<i>Rattus norvegicus</i>)	2	M	FD	10	w	21-28	d	JV	B	HIS	USTR	HM		181	77
86	Rana et. al, 1985	13236	Rat (<i>Rattus norvegicus</i>)	2	U	GV	30	d	90	d	JV	M	ORW	SMIX	LI		5000	75
Reproduction (REP)																		
87	Hill et. al., 1983	45143	Pig (<i>Sus scrofa</i>)	3	U	FD	12	mo	7-8	mo	GE	F	REP	ODVP	WO	8.23	82.3	79
88	Seidenberg et al 1986	113	Mouse (<i>Mus musculus</i>)	2	U	GV	4	d	NR	NR	GE	F	REP	PRWT	NR	8.89		82
89	Alaoui et al, 1985	36854	Rat (<i>Rattus norvegicus</i>)	2	U	FD	5	w	NR	NR	JV	M	REP	ORWT	TE	9.64		71
90	Cerklewski, 1979	37008	Rat (<i>Rattus norvegicus</i>)	2	U	FD	37	d	105	d	LC	F	REP	PRWT	WO	14.4		80
91	Food and Drug Res. Lab, 1973	42289	Mouse (<i>Mus musculus</i>)	3	U	GV	10	d	NR	NR	GE	F	REP	PRFM	WO	30.0		77
92	Khera and Shah, 1979	21134	Rat (<i>Rattus norvegicus</i>)	2	U	FD	4	d	NR	NR	GE	F	REP	PRWT	WO	34.0		69
93	Miller et al., 1989	14685	Cattle (<i>Bos taurus</i>)	3	U	FD	14	w	NR	NR	LC	F	REP	PRWT	WO	37.9	75.9	86
94	Amemiya et al, 1986	21069	Rat (<i>Rattus norvegicus</i>)	2	U	FD	21	d	NR	NR	GE	F	REP	PRWT	WO	41.2		74
95	Evenson et al, 1993	14660	Rat (<i>Rattus norvegicus</i>)	2	U	FD	8	w	3	w	JV	M	REP	TEWT	TE	42.1		70
96	Food and Drug Res. Lab, 1973	42289	Rat (<i>Rattus norvegicus</i>)	4	U	GV	10	d	NR	NR	GE	F	REP	PRFM	WO	42.5		77
97	Food and Drug Res. Lab, 1974	42292	Rabbit (<i>Oryctolagus cuniculus</i>)	5	U	GV	13	d	NR	NR	GE	F	REP	PRFM	WO	60.0		77
98	Food and Drug Res. Lab, 1973	42289	Hamster (<i>Mesocricetus auratus</i>)	3	U	GV	5	d	NR	NR	GE	F	REP	PRFM	WO	88.0		77
99	Shrader et al, 1978	21138	Rat (<i>Rattus norvegicus</i>)	2	U	FD	21	d	NR	NR	GE	F	REP	PRWT	WO	89.6		73
100	Hirsch and Hurley, 1978	21139	Rat (<i>Rattus norvegicus</i>)	2	U	FD	12	d	NR	NR	GE	F	REP	PRWT	WO	89.6		75
101	Hill et al, 1983	35659	Pig (<i>Sus scrofa</i>)	3	U	FD	20	w	NR	NR	LC	F	REP	RHIS	WO	97.8		70
102	Webster, 1979	823	Mouse (<i>Mus musculus</i>)	4	U	FD	19	d	4	mo	GE	F	REP	PRWT	WO	101		79
103	Anderson et al., 1993	139	Mouse (<i>Mus musculus</i>)	2	U	FD	13	w	12	w	JV	M	REP	PRWT	WO	110		74
104	Schlicker and Cox, 1968	25	Rat (<i>Rattus norvegicus</i>)	2	U	FD	36	d	NR	NR	GE	F	REP	PRWT	WO	167		73
105	Ketcheson et al, 1969	37837	Rat (<i>Rattus norvegicus</i>)	3	U	FD	14	d	NR	NR	LC	F	REP	PRWT	WO	181	452	81
106	Maita et al, 1981	43680	Rat (<i>Rattus norvegicus</i>)	4	U	FD	13	w	5	w	JV	M	REP	ORWT	TE	234	2514	82
107	Chu and Cox, 1970	42767	Rat (<i>Rattus norvegicus</i>)	2	U	FD	21	d	NR	NR	LC	F	REP	GREP	WO	347		74
108	Maita et al, 1981	43680	Mouse (<i>Mus musculus</i>)	4	U	FD	13	w	5	w	JV	M	REP	ORWT	TE	458	4927	82
109	Maita et al, 1981	43680	Mouse (<i>Mus musculus</i>)	4	U	FD	13	w	5	w	JV	F	REP	ORWT	OV	479	4878	82
110	Bui, et al, 1998	21045	Rat (<i>Rattus norvegicus</i>)	2	M	GV	7	d	NR	NR	GE	F	REP	PRWT	WO	975		80
111	Maita et al, 1981	43680	Rat (<i>Rattus norvegicus</i>)	4	U	FD	13	w	5	w	JV	F	REP	ORWT	OV	2486		71
112	Kumar, 1976	43587	Rat (<i>Rattus norvegicus</i>)	2	U	FD	17	d	100	d	GE	F	REP	RSEM	WO		12.2	78
113	Barone et al, 1998	21042	Rat (<i>Rattus norvegicus</i>)	2	U	FD	10	d	NR	NR	GE	F	REP	PROG	WO		81.1	73
114	Newman et al, 2002	48540	Rat (<i>Rattus norvegicus</i>)	2	U	FD	16	d	NR	NR	GE	F	REP	PROG	WO		232	81
115	Pal and Pal, 1987	14664	Rat (<i>Rattus norvegicus</i>)	2	U	FD	18	d	120-130	d	GE	F	REP	GREP	WO		326	78
116	Chu and Cox, 1972	42670	Rat (<i>Rattus norvegicus</i>)	2	U	FD	14	d	NR	NR	LC	F	REP	PRWT	WO		326	72
117	Cox et al, 1969	42838	Rat (<i>Rattus norvegicus</i>)	2	U	FD	22	d	NR	NR	GE	F	REP	PRWT	WO		353	74
118	Schlicker and Cox, 1968	25	Rat (<i>Rattus norvegicus</i>)	2	U	FD	18	d	NR	NR	GE	F	REP	PRWT	WO		424	74
Growth (GRO)																		

Table 6.1 Mammalian Toxicity Data Extracted for Wildlife Toxicity Reference Value (TRV)

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Result #	Reference	Ref No.	Test Organism	# of Conc/ Doses	Method of Analyses	Route of Exposure	Exposure Duration	Duration Units	Age	Age Units	Lifestage	Sex	Effect Type	Effect Measure	Response Site	NOEL Dose* (mg/kg bw/day)	LOAEL Dose* (mg/kg bw/day)	Total
119	Attia, et al, 1987	36003	Water buffalo (<i>Bubalus bubalis</i>)	5	U	FD	90	d	7-9	mo	JV	M	GRO	BDWT	WO	4.33		69
120	Huerta et al, 2002	25973	Cattle (<i>Bos taurus</i>)	2	U	FD	50	d	18	mo	JV	F	GRO	BDWT	WO	4.78		68
121	Huerta et al, 2002	25973	Cattle (<i>Bos taurus</i>)	2	U	FD	50	d	18	mo	JV	F	GRO	BDWT	WO	4.78		68
122	Alaoui et al, 1985	36854	Rat (<i>Rattus norvegicus</i>)	2	U	FD	5	w	NR	NR	JV	M	GRO	BDWT	WO	9.64		69
123	Hill et. al., 1983	45143	Pig (<i>Sus scrofa</i>)	3	U	FD	8	mo	7-8	mo	GE	F	GRO	GGRO	WO	10.3	103	77
124	Weigand and Kirchgessner, 197	41855	Rat (<i>Rattus norvegicus</i>)	4	U	FD	12	d	NR	NR	JV	M	GRO	BDWT	WO	11.7		68
125	Eisemann et al, 1979	43242	Pig (<i>Sus scrofa</i>)	2	M	FD	16	w	6-8	w	JV	B	GRO	BDWT	WO	13.5		69
126	Cerklewski, 1979	37008	Rat (<i>Rattus norvegicus</i>)	2	U	FD	37	d	105	d	LC	F	GRO	BDWT	WO	14.4		78
127	Elliot and Walker, 1968	38623	Pig (<i>Sus scrofa</i>)	2	U	FD	4	w	NR	NR	JV	B	GRO	BDWT	WO	14.9		68
128	Cerklewski and Forbes, 1976	2627	Rat (<i>Rattus norvegicus</i>)	2	U	FD	7	w	NR	NR	JV	M	GRO	BDWT	WO	15.7		69
129	Wapnir and Lee, 1993	39821	Rat (<i>Rattus norvegicus</i>)	2	U	FD	3	w	NR	NR	JV	M	GRO	BDWT	WO	15.7		68
130	Agarwal et al, 1986	21084	Rat (<i>Rattus norvegicus</i>)	2	U	FD	14	d	9-10	w	SM	M	GRO	BDWT	WO	18.0		72
131	Brandt, 1983	2033	Mink (<i>Mustela vison</i>)	3	M	FD	4	mo	90	d	JV	M	GRO	BDWT	WO	20.2		82
132	Shankar et al, 1986	46830	Rat (<i>Rattus norvegicus</i>)	2	U	FD	120	d	40	d	JV	F	GRO	BDWT	WO	28.9		73
133	Food and Drug Res. Lab, 1973	42289	Mouse (<i>Mus musculus</i>)	3	U	GV	10	d	NR	NR	GE	F	GRO	BDWT	WO	30.0		75
134	Reeves and Newman, 1997	21067	Rat (<i>Rattus norvegicus</i>)	2	U	FD	7	w	3	w	JV	M	GRO	BDWT	WO	30.4		79
135	Gaynor et al, 1988	47892	Cattle (<i>Bos taurus</i>)	2	M	FD	4	w	NR	NR	LC	F	GRO	BDWT	WO	30.6		74
136	Gaynor et al, 1988	47892	Cattle (<i>Bos taurus</i>)	2	M	FD	5	w	NR	NR	LC	F	GRO	BDWT	WO	33.2		74
137	Khera and Shah, 1979	21134	Rat (<i>Rattus norvegicus</i>)	2	U	FD	4	d	NR	NR	GE	F	GRO	BDWT	WO	34		67
138	Evenson et al, 1993	14660	Rat (<i>Rattus norvegicus</i>)	2	U	FD	8	w	3	w	JV	F	GRO	BDWT	WO	42.1		68
139	Food and Drug Res. Lab, 1973	42289	Rat (<i>Rattus norvegicus</i>)	4	U	GV	10	d	NR	NR	GE	F	GRO	BDWT	WO	42.5		75
140	Brink et al, 1959	14525	Pig (<i>Sus scrofa</i>)	6	U	FD	42	d	NR	NR	JV	NR	GRO	BDWT	WO	43.5	87.1	84
141	Miller et al., 1989	14685	Cattle (<i>Bos taurus</i>)	3	U	FD	14	w	NR	NR	LC	F	GRO	BDWT	WO	63.7		69
142	Reeves et al, 1994	37015	Rat (<i>Rattus norvegicus</i>)	2	U	FD	2	w	NR	NR	JV	M	GRO	BDWT	WO	56		75
143	Food and Drug Res. Lab, 1974	42292	Rabbit (<i>Oryctolagus cuniculus</i>)	5	U	GV	12	d	NR	NR	GE	F	GRO	BDWT	WO	60.0		75
144	Food and Drug Res. Lab, 1973	42289	Hamster (<i>Mesocricetus auratus</i>)	3	U	GV	5	d	NR	NR	GE	F	GRO	BDWT	WO	88.0		75
145	Bui, et al, 1998	21045	Rat (<i>Rattus norvegicus</i>)	2	M	GV	7	d	NR	NR	GE	F	GRO	BDWT	WO	97.5		69
146	Van Vleet et al, 1981	149	Pig (<i>Sus scrofa</i>)	2	U	FD	10	w	NR	NR	JV	M	GRO	BDWT	WO	99.1		73
147	Schell and Kornegay, 1996	42234	Pig (<i>Sus scrofa</i>)	4	M	FD	2	w	23	d	JV	B	GRO	BDWT	WO	103		69
148	Schell and Kornegay, 1996	42234	Pig (<i>Sus scrofa</i>)	4	M	FD	23	d	23	d	JV	B	GRO	BDWT	WO	106		74
149	Anderson et al., 1993	139	Mouse (<i>Mus musculus</i>)	2	U	FD	13	w	12	w	JV	M	GRO	BDWT	WO	110		81
150	Maita et al, 1981	43680	Rat (<i>Rattus norvegicus</i>)	4	U	FD	13	w	5	w	JV	M	GRO	BDWT	WO	234	2514	80
151	Bentley and Grubb, 1991	40436	Rabbit (<i>Oryctolagus cuniculus</i>)	3	U	FD	22	w	NR	NR	JV	B	GRO	BDWT	WO	282		68
152	Llewellyn et al, 1985	2203	Golden hamster (<i>Mesocricetus auratus</i>)	2	U	FD	18	w	NR	NR	JV	M	GRO	BDWT	WO	295		67
153	Maita et al, 1981	43680	Mouse (<i>Mus musculus</i>)	4	U	FD	13	w	5	w	JV	M	GRO	BDWT	WO	458	4927	80
154	Ketcheson et al, 1969	37837	Rat (<i>Rattus norvegicus</i>)	3	U	FD	14	d	NR	NR	LC	F	GRO	BDWT	WO	470		73
155	Maita et al, 1981	43680	Mouse (<i>Mus musculus</i>)	4	U	FD	13	w	5	w	JV	F	GRO	BDWT	WO	479	4878	80
156	O'Neil-Cutting et al, 1981	14656	Rat (<i>Rattus norvegicus</i>)	2	U	FD	18	w	NR	NR	JV	M	GRO	BDWT	WO	597		77
157	Zhang et al, 1995	39356	Mouse (<i>Mus musculus</i>)	2	M	FD	10	d	8	w	JV	F	GRO	BDWT	WO	825		68
158	Zhang et al, 1995	39356	Mouse (<i>Mus musculus</i>)	2	M	FD	10	d	8	w	JV	F	GRO	BDWT	WO	845		73
159	Zhang et al, 1995	39356	Mouse (<i>Mus musculus</i>)	2	M	FD	10	d	8	w	JV	F	GRO	BDWT	WO	846		68
160	Pettersen, et al, 2002	36374	Mouse (<i>Mus musculus</i>)	3	U	FD	3	w	4	w	JV	B	GRO	BDWT	WO	1419	2838	83
161	Urabe and Hayakawa, 1990	40997	Rat (<i>Rattus norvegicus</i>)	2	U	FD	42	d	NR	NR	JV	M	GRO	BDWT	WO	1684		78
162	Maita et al, 1981	43680	Rat (<i>Rattus norvegicus</i>)	4	U	FD	13	w	5	w	JV	F	GRO	BDWT	WO	2486		69
163	Nakamura et al., 1983	638	Rat (<i>Rattus norvegicus</i>)	2	U	FD	11	w	NR	NR	JV	F	GRO	BDWT	WO		8.71	73
164	Rosa et al, 1986	47007	Sheep (<i>Ovis aries</i>)	2	U	FD	56	d	NR	NR	SM	M	GRO	BDWT	WO		16.1	71
165	Subramanian et al, 2000	21011	Rat (<i>Rattus norvegicus</i>)	2	U	FD	6	w	NR	NR	JV	M	GRO	BDWT	WO		28.2	73
166	Davies, et al, 1977	14527	Sheep (<i>Ovis aries</i>)	2	M	FD	26	d	1	w	JV	M	GRO	BDWT	WO		75.7	81
167	Barone et al, 1998	21042	Rat (<i>Rattus norvegicus</i>)	2	U	FD	10	d	NR	NR	GE	F	GRO	BDWT	WO		81.1	71
168	Hsu et al, 1975	14376	Pig (<i>Sus scrofa</i>)	2	U	FD	13	w	4	w	JV	NR	GRO	BDWT	WO		89.1	73
169	Schlicker and Cox, 1968	25	Rat (<i>Rattus norvegicus</i>)	2	U	FD	18	d	NR	NR	GE	F	GRO	BDWT	WO		424	68
170	Settemire and Matrone, 1967	38015	Rat (<i>Rattus norvegicus</i>)	2	U	FD	5	w	4-6	w	JV	M	GRO	BDWT	WO		667	76
171	Ogiso, et. al., 1974	42961	Rat (<i>Rattus norvegicus</i>)	2	U	FD	15	d	NR	NR	JV	M	GRO	BDWT	WO		956	77
172	Scott and Magee, 1979	43264	Rat (<i>Rattus norvegicus</i>)	2	U	FD	1	w	NR	NR	JV	M	GRO	BDWT	WO		968	77
Survival (MOR)																		
173	Seidenberg et al 1986	113	Mouse (<i>Mus musculus</i>)	2	U	GV	4	d	NR	NR	GE	F	MOR	MORT	WO	8.89		85
174	Van der Schee et al, 1980	21171	Sheep (<i>Ovis aries</i>)	3	M	FD	98	d	NR	NR	JV	M	MOR	MORT	WO	12.0		83
175	Food and Drug Res. Lab, 1973	42289	Mouse (<i>Mus musculus</i>)	3	U	GV	10	d	NR	NR	GE	F	MOR	SURV	WO	30.0		76
176	Food and Drug Res. Lab, 1973	42289	Rat (<i>Rattus norvegicus</i>)	4	U	GV	10	d	NR	NR	GE	F	MOR	SURV	WO	42.5		76
177	Brink et al, 1959	14525	Pig (<i>Sus scrofa</i>)	6	U	FD	42	d	NR	NR	JV	NR	MOR	MORT	WO	43.5	87.1	85
178	Food and Drug Res. Lab, 1974	42292	Rabbit (<i>Oryctolagus cuniculus</i>)	5	U	GV	13	d	NR	NR	GE	F	MOR	MORT	WO	60.0		76
179	Ott et al, 1966	14535	Sheep (<i>Ovis aries</i>)	8	U	FD	6	w	NR	NR	JV	NR	MOR	MORT	WO	82.9	99.5	80

Table 6.1 Mammalian Toxicity Data Extracted for Wildlife Toxicity Reference Value (TRV)

Zinc

Page 4 of 4

Result #	Reference	Ref No.	Test Organism	# of Conc/ Doses	Method of Analyses	Route of Exposure	Exposure Duration	Duration Units	Age	Age Units	Lifestage	Sex	Effect Type	Effect Measure	Response Site	NOEL Dose* (mg/kg bw/day)	LOAEL Dose* (mg/kg bw/day)	Total
180	Willoughby et al, 1972	14385	Horse (<i>Equus caballus</i>)	2	M	FD	9	w	3-4	w	JV	F	MOR	MORT	WO	83.7		78
181	Food and Drug Res. Lab, 1973	42289	Hamster (<i>Mesocricetus auratus</i>)	3	U	GV	5	d	NR	NR	GE	F	MOR	SURV	WO	88.0		76
182	Aulerich et al, 1991	46274	Mink (<i>Mustela vison</i>)	4	M	FD	144	d	>1	yr	AD	M	MOR	MORT	WO	165		80
183	Aulerich et al, 1991	46274	Mink (<i>Mustela vison</i>)	4	M	FD	144	d	10-12	w	JV	M	MOR	MORT	WO	297		84
184	Aulerich et al, 1991	46274	Mink (<i>Mustela vison</i>)	4	M	FD	144	d	10-12	w	JV	F	MOR	MORT	WO	324		84
185	Aulerich et al, 1991	46274	Mink (<i>Mustela vison</i>)	4	M	FD	114	d	>1	yr	AD	F	MOR	MORT	WO	327		80
186	Maita et al, 1981	43680	Mouse (<i>Mus musculus</i>)	4	U	FD	13	w	5	w	JV	M	MOR	MORT	WO	458	4927	81
187	Maita et al, 1981	43680	Rat (<i>Rattus norvegicus</i>)	4	U	FD	13	w	5	w	JV	F	MOR	MORT	WO	2486		70
188	Maita et al, 1981	43680	Rat (<i>Rattus norvegicus</i>)	4	U	FD	13	w	5	w	JV	M	MOR	MORT	WO	2514		79
189	Maita et al, 1981	43680	Mouse (<i>Mus musculus</i>)	4	U	FD	13	w	5	w	JV	F	MOR	MORT	WO	4878		79
190	Van Vleet et al, 1981	149	Pig (<i>Sus scrofa</i>)	2	U	FD	10	w	NR	NR	JV	M	MOR	MORT	WO		99.1	78

AD = adult; AHDX = aniline hydroxylase; ALPH = alkaline phosphatase; B = both; BDWT = body weight changes; BEH = behavior; BI = bile; BIO = biochemical; BL = blood; BR = brain; bw = body weight; CALC = calcium; CCOX = cytochrome C-oxidase; CHM = chemical changes; CHOL = cholesterol; d = day; DIFD = digestibility of food; DR = Drinking water; DT = digestive tract; ENZ = enzyme level changes; F = female; FCNS = food consumption; FD = food; FDB = feeding behavior; FDCV = food conversion efficiency; FDNG = feeding behavior; FM = femur; FO = foot; GBCM = general biochemical changes; GE = gestation; GGRO = general growth changes; GLPX = glutathione peroxidase; GLSN = gross lesions; GLUC = glucose; GLYC = glycogen; GPHY = general physiology changes; GRO = growth; GREP = general reproduction; GRS = gross body weight changes; GT = gastrointestinal tract; GV = gavage; HA = hair; HE = heart; HEMT = hematocrit; HIS = histological changes; HM = humerus; HMCT = hematocrit; HMGL = hemoglobin; HRM = hormone changes; IN = intestinal tract; ITX = intoxication; JV = juvenile; kg = kilograms; KI = kidney; LC = lactation; LD = lipid; LI = liver; LOAEL = lowest observed adverse effect level; mg = milligrams; mo = months; M = male; M = measured; MCHC = mean corpuscular hemoglobin; MCPR = microsomal proteins; MK = milk, lactating females; MOR = effects on mortality and survival; MORT = mortality; MPH = morphology; MT = multiple; MU = muscle; NACO = sodium; NOAEL = No Observed Adverse Effect Level; NCRO = necrosis; NR = Not reported; NMVM = number of movements; ODVP = offspring development; OR = other oral; ORW = organ weight changes; ORWT = organ weight changes; OV = ovary; P450 = cytochrome P450; PCLV = packed cell volume; PHY = physiology; PL = plasma; PRFM = pregnant females in a population; PROG = progeny numbers/counts; PRTL = protein, total; PRWT = progeny weight; PS = pancreas; PTH = pathology; RBCE = red blood cell count; REP = reproduction; RHIS = reproductive organ histology; RSEM = resorbed embryos; SH = stomach; SK = skin; SM = sexually mature; SMIX = weight relative to body weight; SP = spleen; SPCL = sperm cell counts; SR = serum; SURV = survival; TB = tibia; TE = testes; TEWT = testes weight; TS = thymus; TWBC = white blood cell count, total; U = unmeasured; UR = urine; USTR = ultrastructural changes; VD = Vas deferens; VTMA = vitamin A; w = weeks; WCON = water consumption; WO = whole organism.

*NOAEL and LOAEL values that are equal and from the same reference represent different experimental designs.

These are designated with different Phase numbers in Appendix 6.1.

Within the reviewed papers there are 190 results for biochemical (BIO), behavior (BEH), physiology (PHY), pathology (PTH), reproduction (REP), growth (GRO), and survival (MOR) endpoints with a total Data Evaluation Score >65 that were used to derive the TRV (U.S. EPA 2003; Attachment 4-4). These data are plotted in Figure 6.1 and correspond directly with the data presented in Table 6.1. The NOAEL results for growth and reproduction are used to calculate a geometric mean NOAEL. This geometric mean is examined in relationship to the lowest bounded LOAEL for reproduction, growth, and survival to derive the TRV according to the Eco-SSL guidance (U.S. EPA 2003; Attachment 4-5).

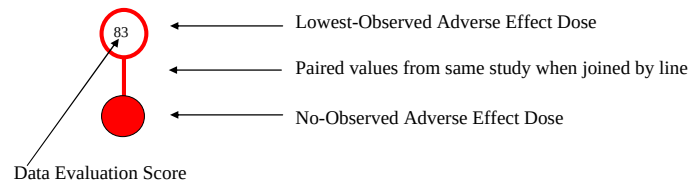
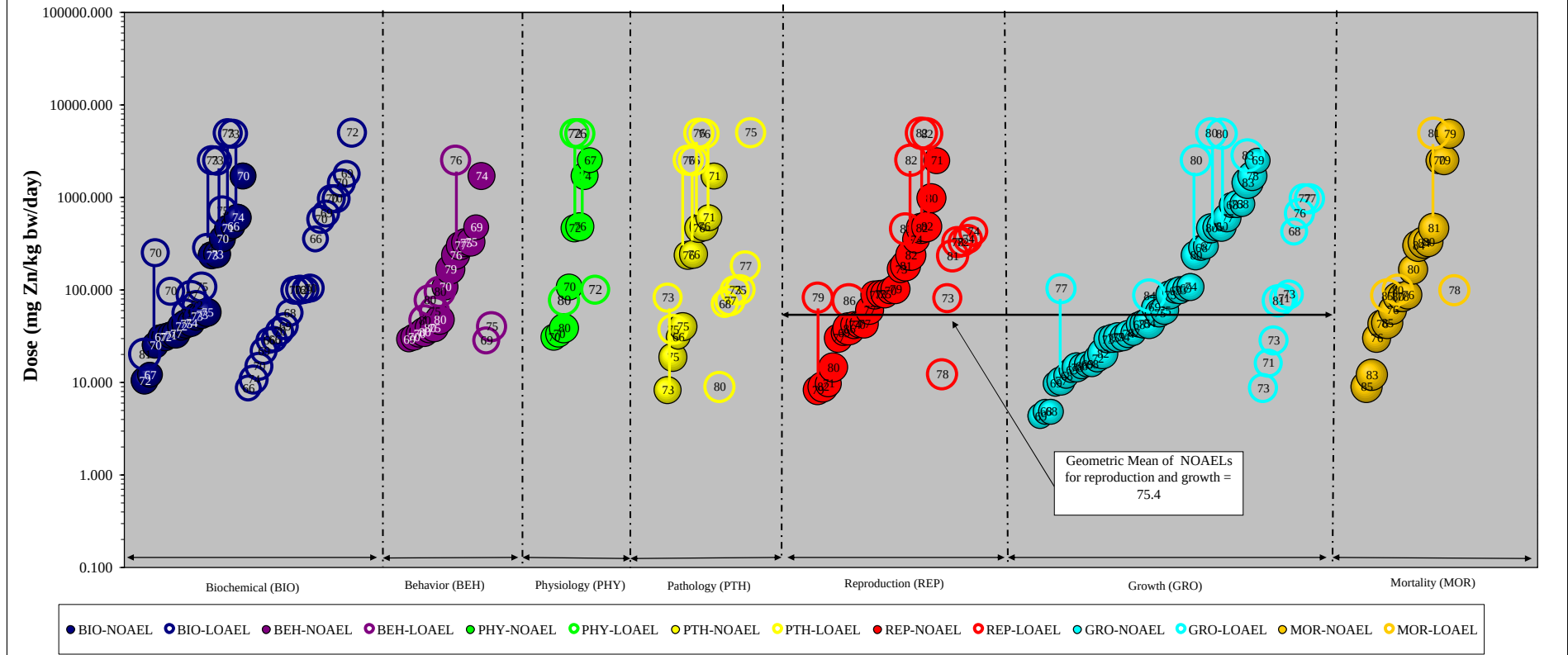
A geometric mean of the NOAEL values for reproduction and growth was calculated at 75.4 mg zinc/kg bw/day. This value is lower than the lowest bounded LOAEL for reproduction, growth, or mortality results. Therefore, the TRV is equal to the geometric mean of the NOAEL values for reproduction and growth and is equal to 75.4 mg zinc/kg bw/day.

6.2 Estimation of Dose and Calculation of the Eco-SSL

Three separate Eco-SSL values were calculated for mammalian wildlife, one for each of three surrogate receptor groups representing different trophic levels. The mammalian Eco-SSLs derived for Zinc were calculated according to the Eco-SSL guidance (U.S. EPA, 2003; Attachment 4-5) and are summarized in Table 6.2.

Table 6.2 Calculation of the Mammalian Eco-SSLs for Zinc					
Surrogate Receptor Group	TRV for Zinc (mg dw/kg bw/d) ¹	Food Ingestion Rate (FIR) ² (kg dw/kg bw/d)	Soil Ingestion as Proportion of Diet (P _s) ²	Concentration of Zinc in Biota Type (i) ^{2,3} (B _i) (mg/kg dw)	Eco-SSL (mg/kg dw) ⁴
Mammalian herbivore (vole)	75.4	0.0875	0.032	$\ln(B_i) = 0.554 * \ln(\text{Soil}_i) + 1.575$ where i = plants	6,800
Mammalian ground insectivore (shrew)	75.4	0.209	0.030	$\ln(B_i) = 0.328 * \ln(\text{Soil}_i) + 4.449$ where i = earthworms	79
Mammalian carnivore (weasel)	75.4	0.130	0.043	$\ln(B_i) = 0.0706 * \ln(\text{Soil}_i) + 4.3632$ where i = mammals	10,000
¹ The process for derivation of wildlife TRVs is described in Attachment 4-5 of U.S. EPA (2003). ² Parameters (FIR, P _s , B _i values, regressions) are provided in U.S. EPA (2003) Attachment 4-1 (revised February 2005). ³ B _i = Concentration in biota type (i) which represents 100% of the diet for the respective receptor. ⁴ $HQ = [FIR * (\text{Soil}_i * P_s + B_i)] / \text{TRV}$ solved for HQ=1 where Soil _i = Eco-SSL (Equation 4-2; U.S. EPA, 2003).					

Figure 6.1 Mammalian TRV Derivation for Zinc



Wildlife TRV Derivation Process

- 1) There are at least three results available for two test species within the growth, reproduction, and mortality effect groups. There are enough data to derive a TRV.
- 2) There are three NOAEL results available within the growth and reproduction effect groups for calculation of a geometric mean.
- 3) The geometric mean is equal to 75.4 mg zinc/kg bw/d and is lower than the lowest bounded LOAEL for results within the reproduction, growth, and survival (MOR) effect groups.
- 4) The mammalian wildlife TRV for zinc is equal to 75.4 mg zinc/kg bw/day which is the geometric mean of NOAEL results within the reproduction and growth effect groups.

7.0 REFERENCES

7.1 General Zinc References

- Anrgone National Laboratory (ANL). 2005. Human Health Fact Sheet, August 2005.
- Agency for Toxic Substances and Disease Registry (ATSDR). 2005. *Toxicological Profile for Zinc*, Atlanta, GA.
- Blume, H.P., and G. Brummer. 1991. Prediction of heavy metal behavior in soil by means of simple field tests. *Ecotoxicology and Environmental Safety*. 22: 164-174.
- Chapman, H.D. 1966. . *Diagnostic Criteria for Plants and Soils*. Pp 484-499
- Christensen JB, Jensen DL, Christensen TH. 1996. Effect of dissolved organic carbon on the mobility of cadmium, nickel and zinc in leachate polluted groundwater. *Water Research*. 30: 3037-3049.
- Clarke, M.L., Harvey, D.G., and Humphreys, D.J. (1981). *Veterinary Toxicology*. 2nd Edition. London: Bailliere Tindall.
- Davis, A.P., Shokouhian, M. and Ni, S. 2001. Loading estimates of lead, copper, cadmium, and zinc in urban runoff from specific sources. *Chemosphere*. 44(5): 997-1009.
- European Chemicals Bureau (ECB). 2004. EU Risk Assessment Report B Zinc chloride. 45: 40.
- Evans, L.J. 1989. Chemistry of metal retention by soils. *Environmental Science and Technology*. 23: 1046-1056.
- Friberg, L., Nordberg, G.F., Kessler, E., and Vouk, V.B. (eds.). 1986. *Handbook of the Toxicology of Metals*. 2nd Edition. Volumes I, II: Amsterdam. Elsevier Science Publishers B.V.
- Goodwin, F.E. 1998. In: *Kirk-Othmer Encyclopedia of Chemical Technology*. 4th Edition. Grant, M.H. (ed.) New York, NY: John Wiley & Sons. 25: 840-853.
- Kiekens, L. 1990. Zinc. In: *Heavy Metals in Soils*. Alloway, B.J. (ed.), Blackie Academic and Professional, Glasgow, UK.
- Lide, D.R. 2005. *CRC Handbook of Chemistry and Physics 86th Edition*. CRC Press, Inc. p. 4-42.
- O'Neill, M.J. (ed.) 2001. *The Merck Index*. 13th edition. Whitehouse Station, NJ: Merck and Co., Inc., p. 1809.
- Ursinyova, M., and V. Hladikova, V. 1999. Essential elements in environmental samples form selected regions in slovakia. *Bulletin of Environmental Contamination and Toxicology*. 62: 409-415.
- World Health Organization (WHO). 2001. *Environmental Health Criteria*. 221: Zinc p. 179.
- U.S. Geological Society (USGS). <http://minerals.usgs.gov/minerals/pubs/commodity/zinc/index.html>
- Hazardous Substances Database (HSBD). <http://toxnet.nlm.nih.gov>. National Library of Medicine.
- United States Environmental Protection Agency (U.S. EPA). 2003. *Guidance for Developing Ecological Soil Screening Levels*. November. Office of Solid Waste and Emergency and Remedial Response. OSWER Directive 92857-55. Revised February 2005.
- United States Environmental Protection Agency (U.S. EPA). 1999. *Ecological Risk Assessment and Risk Management Principles for Superfund Sites*. Office of Emergency and Remedial Response, Washington, DC.

OSWER Directive 9285.7-28.P.

United States Environmental Protection Agency (U.S. EPA). 1998. *Guidelines for Ecological Risk Assessment*. Risk Assessment Forum. U.S. Environmental Protection Agency, Washington DC. EPA/630/R-95/002F. April. May 14, 1998 Federal Register 63(93): 26846-26924.

United States Environmental Protection Agency (U.S. EPA). 1997. *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments*. Interim Final. U.S. Environmental Protection Agency, Environmental Response Team (Edison, NJ). June 5, 1997.

7.2 References for Plants and Soil Invertebrates

Aery, N. C. and Jagetiya, B. L. 1997. Relative Toxicity of Cadmium, Lead and Zinc on Barley. *Commun. Soil Sci. Plant Anal.* 28(11/12): 949 960.

Biro, B., Koves Pechy, K., Voros, I., and Kadar, I. 1998. Toxicity of Some Field Applied Heavy Metal Salts to the Rhizobial and Fungal Microsymbionts of Alfalfa and Red Clover. *Agrokem. Talajtan.* 47(1 4): 265 276.

Conder, J. M. and Lanno, R. P. 2000. Evaluation of Surrogate Measures of Cadmium, Lead, and Zinc Bioavailability to *Eisenia fetida*. *Chemosphere.* 41: 1659 1668.

Dahdoh, M. S. A. 1997. Iron Manganese Zinc Relationships in Broad Bean Grown in Sandy Soils. *Egypt. J. Soil Sci.* 37(4): 499 510.

Dang, Y. P., Chhabra, R., and Verma, K. S. 1990. Effect of Cd, Ni, Pb and Zn on Growth and Chemical Composition of Onion and Fenugreek. *Commun. Soil Sci. Plant Anal.* 21(9/10): 717 735.

De Haan, S. H. Rethfeld and W. Van Drier. 1985. *Acceptable Levels of Heavy Metals (Cd, Cr, Cu, Ni, Pb, Zn) in Soils*. Hren (Gr), The Netherlands (Rapport 9 85).

Donkin, S. G. and Dusenbery, D. B. 1994. Using the *Caenorhabditis elegans* Soil Toxicity Test to Identify Factors Affecting Toxicity to Identify Factors Affecting Toxicity of Four Metal Ions in Intact Soil. *Water Air Soil Pollut.* 78, 359 373

Gupta, U. C. and Arsenault, W. J. 1986. Boron and Zinc Nutrition of Tobacco Grown in Prince Edward Island. *Can. J. Soil Sci.* 66, 67 71

Kadar, I. and Morvai, B. 1998. Effect of Micropollutants on Soil and Crop on Calcareous Sandy Soil. *Agrokem. Talajtan* 47[1 4], 207 214

Korthals, G. W., Popovici, I., Iliev, I., and Lexmond, T. M. 1998. Influence of Perennial Ryegrass on a Copper and Zinc Affected Terrestrial Nematode Community. *Appl. Soil Ecol.* 10[1 2], 73 85

Korthals, G. W., Ende, A. van de, Megen, H. van, Lexmond, T. M., Kammenga, J. E., and Bongers, T. 1996. Short Term Effects of Cadmium, Copper, Nickel and Zinc on Soil Nematodes from Different Feeding and Life History Strategy Groups. *Appl. Soil Ecol.* 4[2], 107 117

Kucharski, J. and Niklewska, T. 1992. The Influence of Zinc on the Yields of Broad Bean and Microbiological Activity of Soil. *Pol. J. Soil Sci.* 25[1], 71 77.

Kumar, V., Ahlawat, V. S., and Antil, R. S. 1985. Interactions of Nitrogen & Zinc in Pearl Millet: 1. Effect of Nitrogen and Zinc Levels on Dry Matter and Concentration in Pearl Millet. *Soil Sci.* 139[4], 351 356

- MacLean, A. J. and Dekker, A. J. 1978. Availability of Zinc, Copper and Nickel to Plants Grown in Sewage Treated Soils. *Can J Soil Sci* 58, 381 389
- Mehta, V. S. and Singh, V. 1988. Effect of Sulfur and Zinc on Yield and Uptake of Nutrients by Mustard. *J.Indian Soc.Soil Sci* 36[1], 190 191
- Monette, L. K. 1978. The Effects of Salinity as Sodium Chloride and the Absorption of Zinc and Cadmium by Barley and Spinach. PhD Thesis, University of California, Davis, CA: 99 p.
- Neuhauser, E. F., Loehr, R. C., and Malecki, M. R. 1985a. Contact and Artificial Soil Tests Using Earthworms to Evaluate the Impact of Wastes in Soil. In: J.K.Petros,Jr., W.J.Lacy, and R.A.Conway (Eds.), *Hazardous and Industrial Solid Waste Testing: 4th Symposium*, ASTM STP 886, Philadelphia, PA 886, 192 203
- Neuhauser, E. F., Loehr, R. C., Milligan, D. L., and Malecki, M. R. 1985b. Toxicity of Metals to the Earthworm *Eisenia fetida*. *Biol.Fertil.Soils* 1[3], 149 152
- Nicholas, D. J. D. 1950. Some Effects of Metals in Excess on Crop Plants Grown in Soil Culture. I. Effects of Copper, Zinc, Lead, Cobalt, Nickel and Manganese on Tomato Grown in an Acid Soil. *Bristol Agric.Hortic.Res.Stn.Annu.Rep.*1950 , 96 108
- Panda, R., Pati, S. S., and Sahu, S. K. 1999. Accumulation of Zinc and Its Effects on the Growth, Reproduction and Life Cycle of *Drawida willsi* (Oligochaeta), a Dominant Earthworm in Indian Crop Fields. *Biol.Fertil.Soils* 29[4], 419 423
- Peredney, C. L. and Williams, P. L. 2000a. Utility of *Caenorhabditis elegans* for Assessing Heavy Metal Contamination in Artificial Soil. *Arch.Environ.Contam.Toxicol.* 39[1], 113 118
- Peredney, C. L. and Williams, P. L. 2000b. Comparison of the Toxicological Effects of Nitrate Versus Chloride Metallic Salts on *Caenorhabditis elegans* in Soil. In: F.T.Price, K.V.Brix, and N.K.Lane (Eds.), *Recent Achievements in Environmental Fate and Transport*, 9th Volume, ASTM STP 1381, West Conshohocken, PA , 256 268
- Posthuma, L., Baerselman, R., Van Veen, R. P. M., and Dirven Van Breemen, E. M. 1997. Single and Joint Toxic Effects of Copper and Zinc on Reproduction of *Enchytraeus crypticus* in Relation to Sorption of Metals in Soils. *Ecotoxicol.Environ.Saf.* 38[2], 108 121
- Rehab, F. I. and Wallace, A. 1978. Excess Trace Metal Effects on Cotton: 2. Copper, Zinc, Cobalt and Manganese in Yolo Loam Soil. *Commun.Soil Sci.Plant Anal.* 9[6], 519 527
- Roszyk, E., Roszyk, S., and Spiak, Z. 1988. The Zinc Amount Toxic for Plants Contaminated in Soils. *Rocz.Glebozn.* 39[3], 57 69
- Sadana, U. S. and Singh, B. 1987a. Yield and Uptake of Cadmium, Lead and Zinc by Wheat Grown in a Soil Polluted with Heavy Metals. *J.Plant Sci.Res.* 3, 11 17
- Sandifer, R. D. and Hopkin, S. P. 1997. Effects of Temperature on the Relative Toxicities of Cd, Cu, Pb, and Zn to *Folsomia candida* (Collembola). *Ecotoxicol.Environ.Saf.* 37, 125 130
- Sandifer, R. D. and Hopkin, S. P. 1996. Effects Of Ph On The Toxicity Of Cadmium, Copper, Lead And Zinc To *Folsomia Candida* Willem, 1902 (Collembola) In A Standard Laboratory Test System. *Chemosphere* 33[12], 2475 2486
- Sheppard, S. C., Evenden, W. G., Abboud, S. A., and Stephenson, M. 1993. A Plant Life Cycle Bioassay for Contaminated Soil, with Comparison to Other Bioassays: Mercury and Zinc. *Arch.Environ.Contam.Toxicol.* 25[1], 27 35

- Singh, B. R. and Jeng, A. S. 1993. Uptake of Zinc, Cadmium, Mercury, Lead, Chromium and Nickel by Ryegrass Grown in a Sandy Soil. *Norw.J.Agric.Sci.* 7[2], 147 157
- Singh, B., Singh, A., Dahiya, I. S., and Dang, Y. P. 1991. Stress Caused by Zinc Deficiency and Toxicity at Different Growth Stages of Wheat. *Crop Res.* 4[1], 96 101
- Smilde, K. W., Van, Luit B., and Van, Driel W. 1992. The extraction by soil and absorption by plants of applied zinc and cadmium. *Plant Soil* 143[2], 233 238
- Smit, C. E. and Van Gestel, C. A. M. 1998. Effects of Soil Type, Prepercolation, and Ageing on Bioaccumulation and Toxicity of Zinc for the Springtail *Folsomia candida*. *Environ.Toxicol.Chem.* 17[6], 1132 1141
- Smit, C. E. and Van Gestel, C. A. M. 1997. Influence of Temperature on the Regulation and Toxicity of Zinc in *Folsomia candida* (Collembola). *Ecotoxicol.Environ.Saf.* 37[3], 213 222
- Smit, C. E. and Van Gestel, C. A. M. 1996. Comparison of the Toxicity of Zinc for the Springtail *Folsomia candida* in Artificially Contaminated and Polluted Field Soils. *Appl.Soil Ecol.* 3, 127 136
- Smit, C. E., van Overbeek, I., and Van Gestel, C. A. M. 1998. The Influence of Food Supply on the Toxicity of Zinc for *Folsomia candida* (Collembola). *Pedobiologia* 42[2], 154 164
- Spurgeon, D. J. and Hopkin, S. P. 1996. The Effects of Metal Contamination on Earthworm Populations Around a Smelting Works: Quantifying Species Effects. *Appl.Soil Ecol.* 4, 147 160
- Spurgeon, D. J. and Hopkin, S. P. 1996. Effects of Variations of the Organic Matter Content and pH of Soils on the Availability and Toxicity of Zinc to the Earthworm *Eisenia fetida*. *Pedobiologia* 40[1], 80 96
- Spurgeon, D. J. and Hopkin, S. P. 1995. Extrapolation of the Laboratory Based OECD Earthworm Toxicity Test to Metal Contaminated Field Sites. *Ecotoxicology* 4[3], 190 205
- Spurgeon, D. J., Hopkin, S. P., and Jones, D. T. 1994. Effects of Cadmium, Copper, Lead and Zinc on Growth, Reproduction and Survival of the Earthworm *Eisenia Fetida* (Savigny): Assessing the Environmental Impact of Point Source Metal Contamination in Terrestrial Ecosystems. *Environ.Pollut.* 84[2], 123 130
- Spurgeon, D. J., Tomlin, M. A., and Hopkin, S. P. 1997. Influence of Temperature on the Toxicity of Zinc to the Earthworm *Eisenia fetida*. *Bull.Environ.Contam.Toxicol.* 58[2], 283 290
- Van Gestel, C. A. M. and Hensbergen, P. J. 1997. Interaction of Cd and Zn Toxicity for *Folsomia candida* Willem (Collembola: Isotomidae) in Relation to Bioavailability in Soil. *Environ.Toxicol.Chem.* 16[6], 1177 1186
- Van Gestel, C. A. M., Dirven Breemen, E. M., and Baerselman, R. 1993. Accumulation and Elimination of Cadmium, Chromium and Zinc and Effects on Growth and Reproduction in *Eisenia andrei* (Oligochaeta, Annelida). *Sci.Total Environ.* Part 1, 585 597
- Voros, I., Biro, B., Takacs, T., Koves Pechy, K., and Bujtas, K. 1998. Effect of Arbuscular Mycorrhizal Fungi on Heavy Metal Toxicity to *Trifolium pratense* in Soils Contaminated with Cd, Zn and Ni Salts. *Agrokem.Talajtan* 47[1 4], 277 288
- White, M. C., Decker, A. M., and Chaney, R. L. 1979b. Differential Cultivar Tolerance in Soybean to Phytotoxic Levels of Soil Zn. I. Range of Cultivar Response. *Agron.J.* 71, 121 126

7.3 References Rejected for Use in Deriving Plant and Soil Invertebrate Eco-SSLs

These references were reviewed and rejected for use in derivation of the Eco-SSL. The definition of the codes describing the basis for rejection is provided at the end of the reference sections.

Mix	Abdul Rida, A. M. 1996. Concentrations and Growth of Earthworms and Plants in Soils Contaminated by Cadmium, Copper, Iron, Lead and Zinc: Interactions Soil Earthworm. <i>Soil Biol Biochem</i> 28[8], 1029 1035
Mix	Abdul Rida, A. M. M. 1996. Concentrations and Growth of Earthworms and Plants in Soils Contaminated by Cadmium, Copper, Iron, Lead and Zinc: Interactions Plant Soil Earthworm. <i>Soil Biol Biochem.</i> 28[8], 1037 1044
Nut def	Abou Hussien, E. A. and Faiyad, M. N. 1996. The Combined Effect of Poudrette, Zinc and Cobalt on Corn Growth and Nutrients Uptake in Alluvial Soils. <i>Egypt. J. Soil Sci.</i> 36[1 4], 47 58
OM, pH	Adams, T. M., McGrath, S. P., and Sanders, J. R. 1985. The Effect of Soil pH on Solubilities and Uptake into Ryegrass of Zinc, Copper and Nickel Added to Soils in Sewage Sludges. In: T.D.Lekkas (Ed.), <i>Heavy Metals in the Environment, Int.Conf., Volume 1</i> , CEP Consultant Ltd., Edinburgh, UK , 484 486
Mix	Adarve, M. J., Hernandez, A. J., Gil, A., and Pastor, J. 1998. Boron, Zinc, Iron, and Manganese Content in Four Grassland Species. <i>J. Environ. Qual.</i> 27[6], 1286 1293
Mix	Adeniyi, A. A. 1996. Determination of Cadmium, Copper, Iron, Lead, Manganese, and Zinc in Water Leaf (<i>Talinum triangulare</i>) in Dumpsites. <i>Environ. Int.</i> 22[2], 259 262
ERE	Aery, N. C. and Sakar, S. 1991. Studies on the Effect of Heavy Metal Stress on Growth Parameters of Soybean. <i>J. Environ. Biol.</i> 12[1], 15 24
OM, pH	Agarwala, S. C., Bisht, S. S., and Sharma, C. P. 1977. Relative Effectiveness of Certain Heavy Metals in Producing Toxicity and Symptoms of Iron Deficiency in Barley. <i>Can. J. Bot.</i> 55, 1299 1307
Species	Aizer, R. S., Rajagopal, C. K., and Money, N. S. 1975. Available Zinc, Copper, Iron, and Manganese Status of the Acid Rice Soils of Kuttanad, Kerala State. <i>Agric. Res. J. Kerala</i> 13, 15 19
Media	Ajay and Rathore, V. S. 1995. Effect of Zn ²⁺ stress in rice (<i>Oryza sativa</i> cv. Manhar) on growth and photosynthetic processes. <i>Photosynthetica</i> 31[4], 571 584
OM, pH	Al Hiyaly, S. A., McNeilly, T., and Bradshaw, A. D. 1988. The Effects of Zinc Contamination from Electricity Pylons Evolution in a Replicated Situation. <i>New Phytol.</i> 110[7], 571 580
Rev	Alabaster, J. S. and Lloyd, R. 1980. Zinc (References). In: J.S.Alabaster and R.Lloyd (Eds.), <i>Water Quality Criteria for Freshwater Fish, Chapter 8</i> , University Press, Cambridge , 159 188
Mix	Alberici, T. M., Sopper, W. E., Storm, G. L., and Yahner, R. H. 1989. Trace Metals in Soil Vegetation and Voles from Mine Land Treated with Sewage Sludge. <i>J. Environ. Qual.</i> 18, 115 120
Mix	Alegria, A., Barbera, R., Boluda, R., Errecalde, F., Farre, R., and Lagarda, M. J. 1992. Relationship Between Cobalt, Copper and Zinc Content of Soils and Vegetables. <i>Nahrung</i> 36[5], 451 460
No Tox	Alvarez, J. M., Obrador, A., and Rico, M. I. 1996. Effects of chelated zinc, soluble and coated fertilizers, on soil zinc status and zinc nutrition of maize49467. <i>Commun.Soil Sci.Plant Anal.</i> 27[1/2], 7 19
Mix	Amaral Sobrinho, N. M. B., Velloso, A. C. X., Costa, L. M., and de Oliveira, C. 1994. Chemical

Forms of Zinc and Its Uptake by Corn Plants in Soil Treated with a Steel Making Residue. Rev. Bras. Cienc. Solo 18[2], 313 320

Mix	Amaral, R. D., Barros, N. F., Costa, L. M., and Fontes, M. P. F. 1996. Effect of a zinc industry residue on soil and on corn plants 49470. Rev. Bras. Cienc. Solo (Portuguese) 20[3], 433 440
No Dur	Andreotis, J. and Papadopoulou, C. 1983. A Study of the Distribution of Chromium, Cobalt, Antimony and Zinc in the Edible Mollusc <i>Meretric chionae</i> from the Aegean Sea. 6th Joint Meet. of the Int. Commission for the Sci. Exp. of the Mediterranean Sea (ICSEM), Dec. 2 4, 1982, Paris, France , 299 301
Nut def	Armour, J. D., Ritchie, G. S. P., and Robson, A. D. 1989. Changes with Time in the Availability of Soil Applied Zinc to Navy Beans and in the Chemical Extraction of Zinc from Soils. Aust. J. Soil Res. 27[4], 699 710
Media	Arora, A. and Katewa, S. S. 1999. Germination as a Screening Index of Heavy Metal Tolerance in Three Ethno Food Grasses. J. Environ. Biol. 20[1], 7 14
Nut Def	Arriechi, E. and Ramirez, R. 1997. Soil Test for Available Zinc in Acid Soils of Venezuela. Commun. Soil Sci. Plant Anal. 28[17/18], 1471 1480
FL	Ashtab, I. V. 1994. Interaction of Zinc with Other Elements as an Index of Its Ecological Activity. Agrokhimiya 11, 114 128 (RUS)
Mix	Assche, F. van and Clijsters, H. 1990. A Biological Test System for the Evaluation of the Phytotoxicity of Metal contaminated Soils. Environ. Pollut. 66[2], 157 172
FL	Atanasova, I. and Stoyanov, D. 1992. Sorption and absorption of zinc and copper by plants on soils of contrasting physicochemical characteristics. Pochvozn., Agrokhim. Ekol., V27, N5 6, P9 12
No Dur	Aucejo, A., Ferrer, J., Gabaldon, C., Marzal, P., and Seco, A. 1997. Diagnosis of Boron, Fluorine, Lead, Nickel and Zinc Toxicity in Citrus Plantations in Villarreal, Spain. Water Air Soil Pollut. 94[3/4], 349 360
No Dose	Ausmus, B. 1972. Study of Lead, Copper, Zinc and Cadmium Contamination of Food Chains of Man. R3 73 034, U.S.EPA, Durham, NC , 117 223018
FL	Avramenko, P. M., Sheveleva, M. A., and Lukin, S. V. 1998. Characteristics of Lead, Zinc, and Cadmium Accumulation in Peas. Agrokhim. Vestn. [2], 16 17
Rev	Babich, H. and Stotzky, G. 1985. Heavy Metal Toxicity to Microbe Mediated Ecologic Processes: A Review and Potential Application to Regulatory Policies. Environ. Res. 36, 111 137
OM	Bahadur, L., Malhi, C. S., and Singh, Z. 1998. Effect of Foliar and Soil Applications of Zinc Sulphate on Zinc Uptake, Tree Size, Yield, and Fruit Quality of Mango. J. Plant Nutr. 21[3], 589 600
Media	Bakardzhieva, N. and Nikolova, R. 1988. Light dependent changes in the activity and in the isoenzyme spectra of the superoxide dismutase and peroxidase in young pea sprouts grown at higher level of manganese and zinc ions. Dokl. Bulg. Akad. Nauk 41[5], 101 104
No Dur	Balch, G. C. and Jones, R. 1991. Zinc in Plants Sediments Snow and Ice Around a Galvanized Electrical Transmission Tower in a Beaver Pond. Water Air Soil Pollut. 59[1 2], 145 152
ERE	Balik, J., Tlustos, P., Pavlikova, D., Szakova, J., Blahnik, R., and Kaewrahn, S. 1998. The Effect

of Sewage Sludge on Zinc Content in Soil and Plants. Rostl. Vyroba 44[10], 457 462 (CZE)

No Dose	Banks, M. K., Schwab, A. P., Fleming, G. R., and Hetrick, B. A. 1994. Effects of Plants and Soil Microflora on Leaching of Zinc from Mine Tailings. Chemosphere 29[8], 1691 1699
Nutr	Bansal, R. L. and Chahal, D. S. 1997. Zinc manganese relationships in berseem (<i>Trifolium alexandrinum</i>) grown on an alkaline soil in a pot experiment. Acta Agron. Hung. 45(4): 449 454.
OM, pH	Banu, F. and Y. D. Tiagi. 1991. Physiological Studies Under Metal Stress Conditions 2. Effect of Zinc and Copper on Growth Performance of <i>Lathyrus sativus</i> . Indian Bot. Contactor 8[1], 1 7
No Tox	Baqir, M. and Harkess, R. L. 1997. Zinc Uptake by <i>Pelargonium x hortorum</i> Grown in Shredded Tire Rubber Amended Media. Hortscience 32[3], 485
Species	Bar Tal, A., Bar Yosef, B., and Chen, Y. 1991. Validation of a Model of the Transport of Zinc to an Artificial Root. J.Soil Sc. 42[3], 399 411
No Efct	Barbosa Filho, M. P., Dynia, J. F., and Zimmermann, F. J. P. 1990. Response of upland rice to zinc and copper with a residual effect on corn. Rev. Bras. Cienc. Solo 14[3], 333 338
Media	Barker, W. G. 1972. Toxicity Levels of Mercury, Lead, Copper and Zinc in Tissue Culture Systems of Cauliflower, Lettuce, Potato and Carrot. Can. J. Bot. 50, 973 976
OM, pH	Barman, S. C. and Lal, M. M. 1994. Accumulation of heavy metals (Zn, Cu, Cd and Pb) in soil and cultivated vegetables and weeds grown in industrially polluted fields. Journal Of Environmental Biology , 107 115
OM, pH	Barnette, R. M. and Warner, J. D. 1935. A Response of Chlorotic Corn Plants to the Application of Zinc Sulfate to the Soil. Soil Sci. 39, 145 159
ERE	Barnette, R. M., Camp, J. P., Warner, J. D., and Gall, O. E. 1936. The Use of Zinc Sulfate Under Corn and Other Field Crops. Bull.No.292, Univ.Fla.Agric.Exp.Sta.Bull., Gainesville, FL , 3 51
ERE	Barrows, H. L., Neff, M. S., and Gammon, N., Jr. 1960. Effect of Soil Type on Mobility of Zinc in the Soil and on Its Availability from Zinc Sulfate to Tung. Soil Sci. Soc. Am. Proc. 24, 367 372
OM, pH	Bartosova, M., Pavel, J., and Koch, M. 1995. Relations Between Heavy Metal Levels in Soil, Detritophagous and Phytophagous Invertebrates. Toxicol. Environ. Chem. 52[1 4], 13 23
Mix	Basta, N. T. and Sloan, J. J. 1999. Bioavailability of Heavy Metals in Strongly Acidic Soils Treated with Exceptional Quality Biosolids. J. Environ. Qual. 28[2], 633 638
Mix	Batjer, L. P. and Benson, N. R. 1958. Effect of Metal Chelates in Overcoming Arsenic Toxicity to Peach Trees. Proc Am Soc Hort Sci 72, 74 78
OM, pH	Bekker, A. W., Hue, N. V., Yapa, L. G. G., and Chase, R. G. 1994. Peanut Growth as Affected by Liming, Ca Mn Interactions and Cu Plus Zn Applications to Oxidic Samoan Soils. Plant Soil 164, 203 211
Rev	Bennett, A. C. 1971. Toxic Effects of Aqueous Ammonia, Copper, Zinc, Lead, Boron, and Manganese on Root Growth. In: E.W.Carson (Ed.), The Plant Root and Its Environment, Chapter 22, Charlottesville University Press, VA , 669 683
Species	Berger, B., Dallinger, R., Felder, E., and Moser, J. 1993. Chpt. 15 Budgeting the Flow on Cadmium

	and Zinc Through the Terrestrial Gastropod, <i>Helix pomatia</i> , L. In: <i>Ecotoxicology of Metals in Invertebrates</i> , Proc.1st SETAC Europe Conf, Apr.7 10, 1991, Sheffield, UK , 291 313
Species	Berger, B., Dallinger, R., Gruber, A., and Moser, J. 1994. Uptake, Assimilation, and Ligand Binding of Cadmium and Zinc in <i>Helix pomatia</i> After Combined Exposure to Both Metals. In: M.H.Donker, H.Eijsackers, and F.Heimbach (Eds.), <i>Ecotoxicology of Soil Organisms</i> , Chapter 25, SETAC Special Publ.Ser., Lewis Publishers, Boca Raton, FL , 347 354
FL	Bergh, H. 1947. Zinc as a Plant Nutrient and Plant Poison (Sink som Plantenering og Plantegift). <i>Nord. Jordbrugsforsk.</i> 1947, 121 130 (ICE)
OM, pH	Bergh, H. 1948. Zinc as a Plant Nutrient and a Plant Poison. <i>Water Cultures and Field Experiments with Grain.</i> Kgl.Norske Videnskab. Selskabs, Skrifter 1942 45[3], 67p. (GER) (ENG ABS)
OM, pH	Bergholm, J. and Steen, E. 1989. Vegetation Establishment on a Deposit of Zinc Mine Wastes. <i>Environ. Pollut.</i> 56[2], 127 144
Media	Berry, W. L. 1978. Comparative Toxicity of VO_3 , CrO_2 , Ni^{2+} , Cu^{2+} , Zn^{2+} , and Cd^{2+} to Lettuce Seedlings. In: D.C.Adriano and I.L.Brisbin,Jr.(Eds.), <i>Environmental Chemistry and Cycling Processes</i> , Proc.Symp.Held at Augusta, Georgia, April 18 May 1, 1976, Tech.Info.Center, U.S.Dep of Energy (U.S.NTIS CONF 760429) , 582 589
Media	Berry, W. L. Dose Reponse Curves for Lettuce Subjected to Acute Toxic Levels of Copper and Zinc. In: ERDA Symp.Ser.No.42, <i>Biological Implications of Metals in the Environment</i> , NTIS, Springfield, VA , 365 369
Mix	Berry, W. L. and Wallace, A. 1989. Interaction of the Yield Response Surface of Lettuce with High and Toxic Concentrations of Zinc and Nickel. <i>Soil Sci.</i> 147[6], 398 400
No Tox	Berry, W. L. 1976. The Effects of Zinc on the Dose Response Curve of Seedling Lettuce to Acute Ni Toxicity. <i>Agron. Abstr.</i> 1976, 20
Mix	Beyer, W. N., Miller, G. W., and Cromartie, E. J. 1984. Contamination of the O 2 Soil Horizon by Zinc Smelting and Its Effect on Woodlouse <i>Porcellio scaber</i> Survival. <i>J. Environ. Qual.</i> 13[2], 247 251
No Dur	Beyer, W. N. and Hemphill, D. D. 1988. Damage to the Forest Ecosystem on Blue Mountain from Zinc Smelting50045. <i>Trace Subst. Environ. Health</i> 22, 249 262
ERE	Beyer, W. N., Chaney, R. L., and Mulhern, B. M. 1982. Heavy Metal Concentrations in Earthworms from Soil Amended with Sewage Sludge. <i>J. Environ. Qual.</i> 11[3], 381 385
No Dur	Beyer, W. N., Pattee, O. H., Sileo, L., Hoffman, D. J., and Mulhern, B. M. 1985. Metal Contamination in Wildlife Living Near Two Zinc Smelters. <i>Environ. Pollut. Ser. A Ecol. Biol.</i> 38[1], 63 86
No ERE	Beyer, W. N., Hensler, G., and Moore, J. 1987. Relation of pH and Other Soil Variables to Concentrations of Pb, Cu, Zn, Cd and Se in Earthworms. <i>Pedobiologia</i> 30, 167 172
ERE	Beyer, W. N. and Anderson, A. 1985. Toxicity to Woodlice of Zinc and Lead Oxides Added to Soil Litter. <i>Ambio</i> 14[3], 172 174
OM, pH	Bhuiya, M. R. H. and Cornfield, A. H. 1976. Effect of Addition of Cu, Cr, Pb and Zn on Nitrogen Mineralisation and Nitrification During Incubation of Sandy Soils. <i>Bangladesh J. Biol. Sci.</i> 5[1], 18 20

ERE	Bhuiya, M. R. H. and Cornfield, A. H. 1972. Effects of Addition of 1000 ppm Cu, Ni, Pb and Zn on Carbon Dioxide Release During Incubation of Soil Alone and After Treatment with Straw. <i>Environ. Pollut.</i> 3, 173 177
ERE	Bhuiya, M. R. H. and Cornfield, A. H. 1974. Incubation Study on Effect of pH on Nitrogen Mineralisation and Nitrification in Soils Treated with 1000 ppm Lead and Zinc, as Oxides 50070. <i>Environ. Pollut.</i> 7, 161 164
OM, pH	Biacs, P. A., Daoood, H. G., and Kadar, I. 1995. Effect of Mo, Se, Zn and Cr Treatments on the Yield, Element Concentration and Carotenoid Content of Carrot. <i>J. Agric. Food Chem.</i> 43[3], 589 591
Media	Bibic, A., Drobne, D., Strus, J., and Bryne, A. R. 1997. Assimilation of Zinc by <i>Porcellio scaber</i> (Isopoda, Crustacea) Exposed to Zinc. <i>Bull. Environ. Contam. Toxicol.</i> 58, 814 821
OM, pH	Bingham, F. T., Page, A. L., and Strong, J. E. 1980. Yield and Cadmium Content of Rice Grain in Relation to Addition Rates of Cadmium, Copper, Nickel, and Zinc with Sewage Sludge and Liming. <i>Soil Sci.</i> 130[1], 32 38
Media	Bittell, J., Koeppe, D. E., and Miller, R. J. 1974. Sorption of Heavy Metals Cations by Corn Mitochondria and the Effects on Electron and Energy Transfer Reactions. <i>Physiol Plant</i> 30, 226 230
Mix	Blair, C. W., Scanlon, P. F., and Hiller, A. L. 1978. Lead, Cadmium, Nickel, and Zinc Levels in Earthworms and Mammals Recovered near Highways of Different Traffic Volumes 58937. <i>Va. J. Sci.</i> 29[2], 57 (ABS)
OM, pH	Boawn, L. C. and Rasmussen, P. E. 1971. Crop Response to Excessive Zinc Fertilization of Alkaline Soil. <i>Agron. J.</i> 63, 874 876
ERE	Boawn, L. C., Viets, F. G., Jr., Crawford, C. L., and Nelson, J. L. 1960. Effect of Nitrogen Carrier, Nitrogen Rate, Zinc Rate, and Soil pH on Zinc Uptake by Sorghum, Potatoes, and Sugar Beets. <i>Soil Sci.</i> 90, 329 337
ERE	Boawn, L. C., Viets, F., Jr., and Crawford, C. L. 1957. Plant Utilization of Zinc from Various Types of Zinc Compounds and Fertilizer Materials. <i>Soil Sci.</i> 83, 219 227
OM, pH	Boawn, L. C. 1971. Zinc Accumulation Characteristics of Some Leafy Vegetables. <i>Soil Sci. Plant Anal.</i> 2[1], 31 36
OM, pH	Boekhold, A. E. and Van der Zee, S. 1994. Field Scale Variability of Cadmium and Zinc in Soil and Barley 50147. <i>Environ. Monit. Assess.</i> 29[1], 1 15
No Dur	Bohn, A. 1979. Trace Metals in Fucoid Algae and Purple Sea Urchins near a High Arctic Lead/Zinc Ore Deposit. <i>Mar. Pollut. Bull.</i> 10[11], 325 327
Mix	Boisson, J., Ruttens, A., and Vangronsveld, J. 1999. Evaluation of Hydroxyapatite as a Metal Immobilizing Soil Additive for the Remediation of Polluted Soils. Part I. Influence of Hydroxyapatite on Metal Exchangeability in Soil, Plant Growth and Plant Metal Accumulation 50160. <i>Environ. Pollut.</i> 104[2], 225 233
No Dur	Boon, D. Y. and Soltanpour, P. N. 1992. Lead, Cadmium and Zinc Contamination of Aspen Garden Soils and Vegetation 50180. <i>J. Environ. Qual.</i> 21[1], 82 86
OM, pH	Borkert, C. M. and Cox, F. R. 1999. Effects of Acidity at High Soil Zinc, Copper and Manganese

	on Peanut, Rice and Soybean. <i>Commun. Soil Sci. Plant Anal.</i> 30[9/10], 1371 1384
OM, pH	Borkert, C. M., Cox, F. R., and Tucker, M. R. 1998. Zinc and Copper Toxicity in Peanut, Soybean, Rice and Corn in Soil Mixtures. <i>Commun. Soil Sci. Plant Anal.</i> 29[19/20], 2991 3005
No Dur	Boruvka, L., Kozak, J., and Kristoufkova, S. 1997. Distribution of Cadmium, Lead, and Zinc in Plants Grown on Heavily Polluted Soils. <i>Rostl. Vyroba</i> 43[6], 249 256
No Conc	Boswell, F. C., Parker, M. B., and Gaines, T. P. 1989. Soil zinc and pH effects on zinc concentrations of corn plants. <i>Commun. Soil Sci. Plant Anal.</i> 20[15/16], 1575 1600
Media	Bowen, J. E. 1972. Manganese Silicon Interaction and Its Effect on Growth of Sudan Grass. <i>Plant Soil</i> 37, 577 588
ERE	Boyle, J. F. and Smith, C. B. 1985. Growth and Leaf Elemental Composition of Snapbeans as Affected by Applied Zinc and Interfacing Fertilizers. <i>Commun. Soil Sci. Plant Anal.</i> 16[5], 501 507
Mix	Bradshaw, A. D. 1952. Populations of <i>Agrostis tenuis</i> Resistant to Lead and Zinc Poisoning 38151. <i>Nature (London)</i> 169, 1098 1110
Media	Brenchley, W. E. 1914. On the Action of Certain Compounds of Zinc, Arsenic, and Boron on the Growth of Plants. <i>Ann. Bot.</i> 28, 283 301
Media	Brenmer, I. and Knight, A. H. 1970. The Complexes of Zinc, Copper, and Manganese Present in Ryegrass. <i>Br. J. Nutr.</i> 24, 279 289
ERE	Brennan, R. F. 1992. The Effect of Zinc Fertilizer on Take All and the Grain Yield of Wheat Grown on Zinc Deficient Soils of the Esperance Region, Western Australia. <i>Fert. Res.</i> 31, 215 219
No Control	Brennan, R. F. 1992. The Effectiveness of Zinc Fertilizers as Measured by DTPA Soil Extractable Zinc, Dry Matter Production and Zinc Uptake by Subterranean Clover in Relation to Soil Properties of a Range of Australian Soils. <i>Aust. J. Soil Res.</i> 30[1], 45 53
OM, pH	Brown, A. L., Krantz, B. A., and Martin, P. E. 1962. Plant Uptake and Fate of Soil Applied Zinc. <i>Soil Sci. Soc. Am. Proc.</i> 26[2], 167 170
ERE	Brown, A. L., Krantz, B. A., and Martin, P. E. 1964. The Residual Effect of Zinc Applied to Soils. <i>Soil Sci. Soc. Am. Proc.</i> 28, 236 238
OM, pH	Brown, G. 1995. The Effects of Lead and Zinc on the Distribution of Plant Species at Former Mining Areas of Western Europe. <i>Flora (Jena)</i> 190[3], 243 249
OM, pH	Brown, J. C. and McDaniel, M. E. 1978. Factors Associated with Differential Response of Oat Cultivars to Iron Stress. <i>Crop Sci.</i> 18, 551 556
ERE	Brown, J. C. and Jones, W. E. 1975. Heavy Metal Toxicity in Plants: 1. A Crisis in Embryo. <i>Commun. Soil Sci. Plant Anal.</i> 6, 421 438
No Control	Brown, M. T. and Wilkins, D. A. 1986. The Effects of Zinc on Germination, Survival and Growth of <i>Betula</i> Seed. <i>Environ. Pollut. Ser. A</i> 41[1], 53 61
Mix	Brown, S. L., Chaney, R. L., Angle, J. S., and Baker, A. J. M. 1994. Phytoremediation Potential of <i>Thlaspi caerulescens</i> and <i>Bladder Campion</i> for Zinc and Cadmium Contaminated Soil 50326. <i>J.</i>

Environ. Qual. 23[6], 1151 1157

Mix	Brown, S. L., Chaney, R. L., Angle, J. S., and Baker, A. J. M. 1995. Zinc and Cadmium Uptake by Hyperaccumulator <i>Thlaspi caerulescens</i> and Metal Tolerant <i>Silene vulgaris</i> Grown on Sludge Amended Soils. Environ. Sci. Technol. 29[6], 1581 1585
Media	Brown, S. L., Chaney, R. L., Angle, J. S., and Baker, A. J. M. 1995. Zinc and cadmium uptake by hyperaccumulator <i>thlaspi caerulescens</i> grown in nutrient solution. Soil Sci. Soc. Am. J. 59[1], 125 133
Mix	Bruce, L. J., McCracken, D. I., Foster, G. N., and Aitken, M. N. 1997. The Effects Of Cadmium And Zinc Rich Sewage Sludge On Epigeic Collembola Populations. Pedobiologia 41[1 3], 167 172
Media	Brunner, I. and Frey, B. 2000. Detection and Localization of Aluminum and Heavy Metals in Ectomycorrhizal Norway Spruce Seedlings. Environ. Pollut. 108[2], 121 128
OM, pH	Buchauer, M. J. 1973. Contamination of Soil and Vegetation near a Zinc Smelter by Zinc, Cadmium, Copper, and Lead. Environ. Sci. Technol. 7[2], 131 135
OM, pH	Bucher, A. S. and Schenk, M. K. 1997. Characterization of Phytoavailable Zinc in Compost Peat Substrates Comparison of Methods. Z. Pflanzenernahr.Bodenkd. 160[6], 595 601
Media	Burleson, C. A. and Page, N. R. 1967. Phosphorus and Zinc Interactions in Flax. Soil Sci. Soc. Am. Proc. 31, 510 513
Mix	Cabral, F., Vasconcelos, E., and Cordovil, C. 1998. Effects of Solid Phase from Pig Slurry on Iron, Copper, Zinc, and Manganese Content of Soil and Wheat Plants 38228. J. Plant Nutr. 21[9], 1955 1966
Media	Cakmak, I., Sari, N., Marschner, H., Kalayci, M., Yilmaz, A., Eker, S., and Gulut, K. Y. 1996. Dry matter production and distribution of zinc in bread and durum wheat genotypes differing in zinc efficiency. Plant Soil 180[2], 173 181
No Dose	Cakmak, I., Torun, B., Erenoglu, B., Ozturk, L., Marschner, H., Kalayci, M., Ekiz, H., and Yilmaz, A. 1998. Morphological and Physiological Differences in the Response of Cereals to Zinc Deficiency. Euphytica 100[1 3], 349 357
Media	Cakmak, Ismail and Marschner, Horst. 1988. Zinc dependent changes in ESR signals, NADPH oxidase and plasma membrane permeability in cotton roots. Physiol. Plant. 73[1], 182 186
Rev	Camp, A. F. 1945. Zinc as a Nutrient in Plant Growth. Soil Sci. 60, 157 164
Media	Carroll, M. D. and Loneragan, J. F. 1968. Response of Plant Species to Concentrations of Zinc in Solution. Aust. J. Agric. Res. 19, 859 868
Rev	Carroll, M. D. and Loneragan, J. F. 1969. Response of Plant Species to Concentrations of Zinc in Solution. II. Rates of Zinc Absorption and Their Relation to Growth. Aust. J. Agric. Res. 20, 457 463
OM, pH	Carter, A. 1983. Cadmium, Copper, and Zinc in Soil Animals and Their Food in a Red Clover System. Can. J. Zool. 61, 2751 2757
No Dose	Cataldo, D. A. and Wildung, R. E. 1978. Soil and Plant Factors Influencing the Accumulation of Heavy Metals by Plants. Environ. Health Perspect. 27, 149 159

FL	Celardin, F. and Landry, J. C. 1988. Bioindicators of Pollution Earthworms and Heavy Metals in Soil. Arch. Sci. (Geneva) 41[2], 225 228
Nut Def	Chahal, D. S. and Randhawa, N. S. 1977. Dynamics of Zinc Absorption by Wheat. Indian J. Agric. Sci. 47[10], 489 492
No Dur	Chambers, J. C. and Sidle, R. C. 1991. Fate of Heavy Metals in an Abandoned Lead Zinc Tailings Pond I. Vegetation 50595. J. Environ. Qual. 20[4], 745 751
Media	Chandler, W. H., Hoagland, D. R., and Hibbard, P. L. 1932. Little Leaf or Rosette of Fruit Trees II: Effect of Zinc and Other Treatments. Proc. Am. Soc. Hortic. Sci. 29, 255 263
Rev	Chandler, W. H. 1937. Zinc as a Nutrient for Plants. Bot. Gaz. 98[4], 625 646
No Dose	Chaney, R. L., Green, C. E., Filcheva, E., and Brown, S. L. 1994. Effect of Iron, Manganese and Zinc Enriched Boisolids Compost on Uptake of Cd by Lettuce from Cadmium Contaminated Soils 50615. In: R.H.Dowdy, et al.(Eds.), Sewage Sludge: Land Utilization and the Environment, ASA CSSA SSSA, Madison, WI , 205 207
Media	Chaney, R. L. 1970. Effect of Nickel on Iron Metabolism by Soybean. Diss. Abstr. Int. 31, 1692 1693
OM, pH	Chaney, R. L., White, M. C., and Simon, P. W. 1975. Plant Uptake of Heavy Metals from Sewage Sludge Applied to Land 50610. In: Proc.2nd Natl.Conf.Munic.Sludge Manage., Information Transfer, Rockville, MD , 169 178
Mix	Chaney, R. L., Lee, M. H., and Murray, J. J. 1989. Response of Yellow Nutsedge, Barley, Lettuce, Soybean, Little Bluestem, Canada Bluegrass, and Cultivars of Tall Fescue, Red Fescue, Kentucky Bluegrass, and Perennial Ryegrass to Excessive Sewage Sludge Applied Soil Zinc in an Acidic Soil. Final Rep.to Army Corps of Eng., Environ.Lab., Waterways Exp.Sta., Vicksburg, MS , 44 p.
Rev	Chaney, R. L. 1993. Zinc Phytotoxicity. Dev. Plant Soil Sci. 55, 135 150
Media	Chaney, W. R. and Strickland, R. C. 1984. Relative toxicity of heavy metals to red pine pinus resinosa pollen germination and germ tube elongation. J. Environ. Qual. 13[3], 391 394
Rev	Chang, A. C., Granato, T. C., and Page, A. L. 1992. A Methodology for Establishing Phytotoxicity Criteria for Chromium, Copper, Nickel, and Zinc in Agricultural Land Application of Municipal Sewage Sludges. J. Environ. Qual. 21[4], 521 536
Media	Chaoui, A., Ferjani, E., and Ghorbal, M. H. 1995. Zinc Phytotoxicity and Induction of Stress Proteins in Bean (Phaseolus vulgaris L.) (Phytotoxicite du Zinc et Induction de Proteines de Stress Chez le Haricot (Phaseolus vulgaris L.). C.R.Soc.Biol. 189[4], 667 678
Rev	Chapman, H. D. 1966. Zinc. In: H.D.Chapman (Ed.), Diagnostic Criteria for Plants and Soils, University of California, Berkeley, CA , 495 499
Species	Chaudri, A. M., Knight, B. P., Barbosa Jefferson, V. L., Preston, S., Paton, G. I., Killham, K., Coad, N., Nicholson, F. A., Chambers, B. J., and McGrath, S. P. 1999. Determination of Acute Zn Toxicity in Pore Water from Soils Previously Treated with Sewage Sludge Using Bioluminescence Assays. Environ.Sci.Technol. 33[11], 1880 1885
OM, pH	Chaudri, A. M., McGrath, S. P., and Giller, K. E. 1992. Survival of the Indigenous Population of Rhizobium leguminosarum Biovar trifolii in Soil Spiked with Cd, Zn, Cu and Ni Salts. Soil Biol.

Biochem. 24[7], 625 632

No Dur	Chernykh, N. A. 1991. Alteration of the Concentrations of Certain Elements in Plants by Heavy Metals in the Soil. Sov. Soil Sci. 23[6], 45 53 (ENG TRANSL)
Media	Cheung, Y. H., Wong, M. H., and Tam, N. F. Y. 1989. Root and Shoot Elongation as an Assessment of Heavy Metal Toxicity and 'Zn Equivalent Value' of Edible Crops. Hydrobiologia 188/189, 377 383
Media	Chiu, C. Y. and Chou, C. H. 1991. The distribution and influence of heavy metals in mangrove forests of the tamshui estuary in taiwan. Soil Sci Plant Nutr 37[4], 659 669
ERE	Chlopecka, A. 1993. Forms of Trace Metals from Inorganic Sources in Soils and Amounts Found in Spring Barley. Water Air Soil Pollut. 69[1 2], 127 134
OM, pH	Chlopecka, A. and Adriano, D. C. 1997. Zinc Uptake by Plants on Amended Polluted Soils. Soil Sci.Plant Nutr. 43[Special Issue SI], 1031 1036
Mix	Chlopecka, A. and Adriano, D. C. 1996. Mimicked in situ stabilization of metals in a cropped soil: bioavailability and chemical form of zinc. Environ. Sci. Technol. 3294 3303.
Media	Chongpraditnun, Praphasri, Mori, Satoshi, and Chino, Mitsuo. 1992. Excess copper induces a cytosolic copper zinc superoxide dismutase in soybean root. Plant Cell Physiol. 33[3], 239 244
OM, pH	Choudhary, M., Bailey, L. D., and Grant, C. A. 1994. Effect of Zinc on Cadmium Concentration in the Tissue of Durum Wheat. Can. J. Plant Sci. 74[3], 549 552
OM, pH	Choudhary, M., Bailey, L. D., Grant, C. A., and Leisle, D. 1995. Effect of Zn on the Concentration of Cd and Zn in Plant Tissue of Two Durum Wheat Lines. Can. J. Plant Sci. 75[2], 445 448
ERE	Christie, P. and Beattie, J. A. M. 1989. Grassland Soil Microbial Biomass and Accumulation of Potentially Toxic Metals from Long term Slurry Application. J. Appl. Ecol. 26[2], 597 612
ERE	Chude, V. O. and Obigbesan, G. O. 1983. Effect of Zinc Application on the Dry Matter Yield Uptake and Distribution of Zinc and Other Micronutrients in Cocoa (Theobroma cacao. L.). Commun. Soil Sci. Plant Anal. 14[10], 989 1004
Mix	Chukwuma, C. 1993. Comparison of the Accumulation of Cadmium, Lead and Zinc in Cultivated and Wild Plant Species in the Derelict Enyigba Lead Ainc Mine. Toxicol. Environ. Chem. 38[3/4], 167 173
Media	Chung, R. S., Lee, B. L., and Lin, H. C. 1993. Manganese Toxicity Alleviation by Silicon, Magnesium, Iron or Zinc in Soybean Plant. J. Chin. Agric. Chem. Soc. 31[3], 412 419
Media	Clark, R. B., Pier, P. A., Knudsen, D., and Maranville, J. W. 1981. Effect of Trace Element Deficiencies and Excesses on Mineral Nutrients in Sorghum. J. Plant Nutr. 3[1 4], 357 374
OM, pH	Clements, H. F. 1974. Soil Toxicities as Causes of Sugarcane Leaf Freckle, Macadamia Leaf Chlorosis (Keaau) and Maui Sugarcane Growth Failure. Hawaii Agric Exp Stn Tech Bull 88, 52
Rev	Cleven, R. F. M. J., Janus, J. A., Annema, J. A., and Slooff, W. 1993. Integrated Criteria Document Zinc. RIVM Rep.No.710401028, Natl.Inst.of Public Health and the Environment, Bilthoven, The Netherlands , 180 p.

Media	Coles, K. E., Fisher, P. J., Macnair, M. R., and Lappin Scott, H. M. 1998. Bioremediation of Contaminated Soils Do Plant Associated Fungi Enhance Metal Uptake by Hyperaccumulating Plants? Abstr.of the Gen.Meet.of the Am.Soc.for Microbiol. 407
Rev	Collins, J. C. 1981. Zinc. In: N.W.Lepp (Ed.), Effect of Heavy Metal Pollution on Plants, Volume 1: Effect of Trace Metals on Plant Function, Applied Science Publ., London , 145
Media	Colpaert, J. V. and Van, Assche J. A. 1992. Zinc Toxicity in Ectomycorrhizal pinus sylvestris. Plant Soil 143[2], 201 211
OM, pH	Conner, S. D. 1920. The Effect of Zinc in Soil Tests with Zinc and Galvanized Iron Pots. J. Am. Soc. Agron. 12, 61 64
Mix	Cook, C. M., Sgardelis, S. P., Pantis, J. D., and Lanaras, T. 1994. Concentrations of Pb, Zn, and Cu in Taraxacum spp. in Relation to Urban Pollution. Bull. Environ. Contam. Toxicol. 53[2], 204 210
OM, pH	Cook, J. A. 1958. Field Trials with Foliar Sprays of Zn EDTA to Control Zinc Deficiency in California Vineyards. Proc.Am.Soc.Hortic.Sci. 72, 158 164
Media	Coughtrey, P. J. and Martin, M. H. 1979. Cadmium, Lead and Zinc Interactions and Tolerance in Two Populations of Holcus lanatus L. Grown in Solution Culture. Environ. Exp. Bot. 19, 285 290
Media	Coulaud, J. and McNeilly, T. 1992. Zinc Tolerance in Populations of Deschampsia cespitosa (Graminae) Beneath Electricity Pylons. Pl Syst Ecol 179, 175 185
Media	Cox, R. M., Thurman, D. A., and Breett, M. 1976. Some Properties of the soluble Acid Phosphatases of Roots of Zinc Tolerant and Non Tolerant clones of Anthoxanthum odoratum. New Phytol. 77, 547 552
Mix	Cunningham, J. D., Keeney, D. R., and Ryan, J. A. 1975. Phytotoxicity and Uptake of Metals Added to Soils as Inorganic Salts or in Sewage Sludge50963. J.Environ.Qual. 4[4], 460 462
Mix	Cunningham, J. D., Ryan, J. A., and Keeney, D. R. 1975. Phytotoxicity in and Metal Uptake from Soil Treated with Metal Amended Sewage Sludge 50962. J. Environ. Qual. 4[4], 455 459
Media	Czuba, M. and Ormrod, D. P. 1974. Effects of Cadmium and Zinc on Ozone Induced Phototoxicity in Cress and Lettuce. Can J Bot 52, 645 649
Media	Dabin, P., Marafante, E., Mousny, J. M., and Myttenaere, C. 1978. Absorption, Distribution and Binding of Cadmium and Zinc in Irrigated Rice Plants. Plant Soil 50, 329 341
Media	Dallinger, R. and Wieser, W. 1984. Patterns of Accumulation, Distribution and Liberation of Zn, Cu, Cd and Pb in Different Organs of the Land Snail Helix pomatia, L. Comp. Biochem. Physiol.C 79, 117 124
Mix	Dallinger, R., Berger, B., and Gruber, A. 1993. Quantitative Aspects of Zinc and Cadmium Binding in Helix pomatia: Differences Between an Essential and a Nonessential Trace Element 51005. In: R.Dallinger and P.S.Rainbow (Eds.), Ecotoxicology of Metals in Invertebrates, Chapter 16, SETAC Special Publications Series, Lewis Publishers, Boca Raton, FL , 315 332
No Control	Dang, Y. P., Dalal, R. C., Edwards, D. G., and Tiller, K. G. 1994. Kinetics of Zinc Desorption from Vertisols51009. Soil Sci. Soc. Am. J. 58[5], 1392 1399
No Control	Dang, Y. P., Dalal, R. C., Edwards, D. G., and Tiller, K. G. 1994. Zinc Buffer Capacity of Vertisols. Aust. J .Soil Res. 32[6], 1231 1242

Mix	Davies, B. E. and Roberts, L. J. 1975. Heavy Metals in Soils and Radish in a Mineralised Limestone Area of Wales, Great Britain. <i>Sci. Total Environ.</i> 4, 249 261
No Dur	Davies, B. E. 1992. Interrelationships Between Soil Properties and the Uptake of Cadmium, Copper, Lead and Zinc from Contaminated Soils by Radish <i>Raphanus sativus</i> L. 51038. <i>Water Air Soil Pollut.</i> 63[3/4], 331 342
Media	Davies, Brian E. 1993. Radish as an indicator plant for derelict land: uptake of zinc at toxic concentrations. <i>Commun.Soil Sci.Plant Anal.</i> 24[15/16], 1883 1895
Media	Davies, G. N. 1941. An Investigation of the Effect of Zinc Sulphate on Plants. <i>Ann.Appl.Biol.</i> 28[2], 81 84
Media	Davies, K. L., Davies, M. S., and Francis, D. 1995. The Effects of Zinc on Cell Viability and on Mitochondrial Structure in Contrasting Cultivars of <i>Festuca rubra</i> L. A Rapid Test for Zinc Tolerance. <i>Environ.Pollut.</i> 88[1], 109 113
OM, pH	Davis, J. G., Gaines, T. P., and Parker, M. B. 1995. Comparison of Soil Zinc Extractants for Detection of Applied Zinc and Prediction of Leaf Zinc Concentration. <i>Commun.Soil Sci.Plant Anal.</i> 26[17/18], 2969 2981
No COC	Davis, J. G., Weeks, G., and Parker, M. B. 1995. Use of Deep Tillage and Liming to Reduce Zinc Toxicity in Peanuts Grown on Flue Dust Contaminated Land. <i>Soil Technol.</i> 8[2], 85 89
OM, pH	Davis, J. G. and Parker, M. B. 1993. Zinc Toxicity Symptom Development and Partitioning of Biomass and Zinc in Peanut Plants. <i>J.Plant Nutr.</i> 16[12], 2353 2369
OM, pH	Davis, R. D. and Carlton Smith, C. H. 1984. An Investigation into the Phytotoxicity of Zinc, Copper and Nickel Using Sewage Sludge of Controlled Metal Content. <i>Environ.Pollut.Ser.B</i> 8[3], 163 185
OM, pH	Davis, R. D. and Beckett, P. H. T. 1978. Upper Critical Levels of Toxic Elements in Plants. II. Critical Levels of Copper in Young Barley, Wheat, Rape, Lettuce and Ryegrass and of Nickel and Zinc in Young Barley and Ryegrass. <i>New Phytol.</i> 80[1], 23 32
Bio Acc	Davis Carter, J. G., Parker, M. B., and Gaines, T. P. 1991. Interaction of soil zinc, calcium, and pH with zinc toxicity in peanuts. <i>Dev. Plant Soil Sci.</i> , V45, NPlant Soil Interact.Low pH, 339 347
OM, pH	De Lima Filho, O. F. and Malavolta, E. 1998. Evaluation of Extraction Procedures on Determination of Critical Soil and Foliar Levels of Boron and Zinc in Coffee Plants. <i>Commun. Soil Sci. Plant Anal.</i> 29[7/8], 825 833
Media	DeKock, P. C. 1956. Heavy Metal Toxicity and Iron Chlorosis. <i>Ann. Bot.</i> 20[77], 133 141
OM, pH	Dell, B. and Wilson, S. A. 1985. Effect of Zinc Supply on Growth of Three Species of <i>Eucalyptus</i> Seedlings and Wheat. <i>Plant Soil</i> 88, 377 384
Media	Dennis, J. L., Mutwakil, M. H. A. Z., Lowe, K. C., and De Pomerai, D. I. 1997. Effects of Metal Ions in Combination with a Non Ionic Surfactant on Stress Responses in a Transgenic Nematode. <i>Aquat. Toxicol.</i> 40[1], 37 50
Media	Denny, H. J. and Ridge, I. 1995. Fungal Slime and Its Role in the Mycorrhizal Amelioration of Zinc Toxicity to Higher Plants. <i>New Phytol.</i> 130[2], 251 157
Media	Denny, H. J. and Wilkins, D. A. 1987. Zinc Tolerance in <i>Betula</i> spp. I. Effect of External

Concentration on Zinc on Growth and Uptake. *New Phytol.* 106, 517 524

Score	De Varennes, A., Torres, M. O., Coutinho, J. F., Rocha, M. M. G. S., and Neto, M. M. P. M. 1996. Effects of Heavy Metals on the Growth and Mineral Composition of a Nickel Hyperaccumulator. <i>J. Plant Nutr.</i> 19[5], 669 676.
OM, pH	Diaz, G., Azcon Aguilar, C., and Honrubia, M. 1996. Influence of Arbuscular Mycorrhizae on Heavy Metal (Zn and Pb) Uptake and Growth of <i>Lygeum spartum</i> and <i>Anthyllis cytisoides</i> . <i>Plant Soil</i> 180[2], 241 249
OM, pH	Dixit, U. C. and Patro, N. 1994. Effect of Levels of NPK, Zinc and Plant Density on Yield Attributes and Yield of Summer Rice. <i>Environ. Ecol.</i> 12[1], 72 74
FL	Dong, Muxin and Zhang, Hui. 1992. Effects of zinc and cadmium on growth of rice and their interaction in absorption and accumulation by plants. <i>Zhiwu Shenglixue Tongxun</i> 28[2], 111 113
Media	Donker, M. H., Raedecker, M. H., and Van Straalen, N. M. 1992. Response to Zinc Contaminated Food in Two Populations of the Isopod <i>Porcellio scaber</i> . Ph.D.Thesis, M.H.Donker (Ed.), <i>Physiology of Metal Adaptation in Porcellio scaber</i> , Vrije Universiteit, Amsterdam, Netherlands, Chapter 4 , 53 74
Media	Donker, M. H., Abdel Lateif, H. M., Khalil, M. A., Bayoumi, B. M., and Van Straalen, N. M. 1998. Temperature, Physiological Time and Zinc Toxicity in the Isopod <i>Porcellio scaber</i> . <i>Environ. Toxicol. Chem.</i> 17[8], 1558 1563
Media	Donker, M. H., Raedecker, M. H., and Van Straalen, N. M. 1996. The Role of Zinc Regulation in the Zinc Tolerance Mechanism of the Terrestrial Isopod <i>Porcellio scaber</i> . <i>J Appl Ecol</i> 33, 955 964
Rev	Donkin, Steven G. 1997. Graphical determination of metal bioavailability to soil invertebrates utilizing the Langmuir sorption model 51277. <i>ASTM Spec.Tech.Publ.</i> , VSTP 1317, <i>Environmental Toxicology and Risk Assessment: Modeling and Risk Assessment</i> 6, 28 43
OM, pH	Dorn, C. R., Pierce, J. O., Chase, G. R., and Phillips, P. E. 1975. Environmental Contamination by Lead, Cadmium, Zinc, and Copper in a New Lead Producing Area 51279. <i>Environ. Res.</i> 9, 159 172
Mix	Dowdy, R. H. and Ham, G. E. 1977. Soybean Growth and Elemental Content as Influenced by Soil Amendments of Sewage Sludge and Heavy Metals: Seedling Studies. <i>Agron.J.</i> 69, 300 303
FL	Drabent, Z., Radecka, H., and Radecki, J. 1988. Effect of Fertilization on Magnesium, Manganese and Zinc Uptake by Corn Growing on Soil Polluted by Tetraethyllead (Wplyw Skazenia Gleby Czteroetylowiem na Zawartosc Mg, Mn i Zn w Kukurydzy). <i>Acta Acad.Agric.Tech.Olstenensis</i> [46], 49 58 (POL)
Media	Drobne, D. and Strus, J. 1996. Moulting Frequency of the Isopod <i>Porcellio scaber</i> as a Measure of Zinc Contaminated Food. <i>Environ.Toxicol.Chem.</i> 15, 126 130
Media	Drobne, D. and Strus, J. 1996. The Effect of Zn on the Digestive Gland Epithelium of <i>Porcellio scaber</i> (Isopoda, Crustacea). <i>Pflueg Arch Eur J Physiol</i> 431, 247 248
Media	Drobne, D. and Hopkin, S. P. 1995. The Toxicity of Zinc to Terrestrial Isopods in a 'Standard' Laboratory Test. <i>Ecotoxicol.Environ.Saf.</i> 31, 1 6
Mix	Dudka, S., Piotrowska, M., and Terelak, H. 1997. Transfer of cadmium, lead, and zinc from industrially contaminated soil to crop plants: a field study. <i>Environ.Pollut.</i> 94[2], 181 188

OM, pH	Dueck, T. A. 1986. Effects of Sulphur Dioxide, Zinc and Copper on Life History Characteristics of <i>Silene cucubalus</i> . In: T.A.Dueck, Impact of Heavy Metals and Air Pollutants on Plants, Acadmisch Proefschrift, Free University Press, Amsterdam , 133 149
OM, pH	Dunne, T. C. and Elliott, H. G. 1950. Zinc Fertilizers for Subterranean Clover at Kendenup. <i>J.Agric.W.A.</i> 27[2nd Ser.], 115 117
Media	Dutta, B. K. and Bremner, E. 1981. Trace Elements as Plant Chemotherapeutants to Control Verticillium Wilt (Spurenelemente als Pflanzenchemotherapeutika zur Bekämpfung von Verticillium Welke). <i>J.Plant Dis.Prot.(Z.Pflanzenkr.Pflanzenschutz)</i> 88[7], 405 412
FL	Duwensee, H. A. 1992. Anthocyanin Coloration in <i>Agrostis stolonifera</i> L. on Heavy Metal Containing Soils (Lead, Zinc) in the Harz (Zur Anthocyanfarbung bei <i>Agrostis stolonifera</i> L. auf Schwermetallboden (Pb, Zn) im Harz). <i>Florist.Rundbriefe</i> 26[1], 48 49 (GER)
OM, pH	Ebbs, S. D. and Kochian, L. V. 3 15 1998. Phytoextraction of zinc by oat (<i>Avena sativa</i>), barley (<i>Hordeum vulgare</i>), and Indian mustard (<i>Brassica juncea</i>). <i>Environ.Sci.Technol.</i> 32[6], 802 806
Media	Ebbs, S. D. and Kochian, L. V. 1997. Toxicity of Zinc and Copper to Brassica Species: Implications for Phytoremediation. <i>J.Environ.Qual.</i> 26[3], 776 781
Rev	Eisler, R. 1993. Zinc Hazards to Fish, Wildlife, and Invertebrates. A Synoptic Review. <i>Biol.Rep.10.Contaminated Hazard Reviews</i> , Fish and Wildlife Services, U.S.Dep.of Interior, Washington, D.C. 106
Media	El Kenawy, Z. A., Angle, J. S., Gewaily, E. M., El Wafai, N. A., Van Berkum, P., Chaney, R. L., and Ibekwe, M. A. 1997. Zinc and Cadmium Effects on the Early Stages of Nodulation in White Clover. <i>Agron.J.</i> 89[6], 875 880
OM, pH	Elgawhary, S. M., Lindsay, W. L., and Kemper, W. D. 1970. Effect of EDTA on the Self Diffusion of Zinc in Aqueous Solution and in Soil 51452. <i>Soil Sci.Soc.Am.Proc.</i> 34, 66 70
FL	Emmerling, C., Krause, K., and Schroder, D. 1997. The Use of Earthworms in Monitoring Soil Pollution by Heavy Metals (Regenwurmer als Bioindikatoren fur Schwermetallbelastungen von Boden Unter Freilandbedingungen). <i>Z.Pflanzenernaehr.Bodenkd.</i> 160[1], 33 39 (GER) (ENG ABS)
OM, pH	Engler, R. M. and Patrick, W. H. 1975. Stability of Sulfides of Manganese, Iron, Zinc, Copper, and Mercury in Flooded and Non flooded Soil. <i>Soil Sci</i> 119, 217 221
OM, pH	Entry, J. A. and Emmingham, W. H. 1996. Accumulation of Lead and Zinc in Contaminated Potting Soil by Tree Seedlings. <i>Abstr. Pap. Am. Chem. Soc. AGRO</i>
Media	Erenoglu, B., Cakmak, I., Marschner, H., Romheld, V., Eker, S., Daghan, H., Kalayci, M., and Ekiz, H. 1996. Phytosiderophore Release Does not Relate Well with Zinc Efficiency in Different Bread Wheat Genotypes. <i>J. Plant Nutr.</i> 19[12], 1569 1580
No COC	Evans, A. Jr. 1991. Influence of Low Molecular Weight Organic Acids on Zinc Distribution Within Micronutrient Pools and Zinc Uptake by Wheat. <i>J. Plant Nutr.</i> 14 12[1307 1318]
Species	Ewell, W. S., Gorsuch, J. W., Kringle, R. O., Robillard, K. A., and Spiegel, R. C. 1986. Simultaneous Evaluation of the Acute Effects of Chemicals on Seven Aquatic Species. <i>Environ. Toxicol. Chem.</i> 5[9], 831 840
Media	Fabiano, E., Gualtieri, G., Pritsch, C., Polla, G., and Arias, A. 1994. Extent of High Affinity Iron Transport Systems in Field Isolates of Rhizobia. <i>Plant Soil</i> 164[2], 177 185

Media	Failla, M. L., Benedict, C. D., and Weinberg, E. D. 1976. Accumulation and Storage of Zn ²⁺ by <i>Candida utilis</i> . J. Gen. Microbiol. 94, 23 36
Rev	Failla, M. L. and Weinberg, E. D. 1980. Zinc Transport and Metabolism in Microorganisms. In: J.O.Nriagu (Ed.), Zinc in the Environment.Part II: Health Effects, Chapter 18, JohnWiley & Sons Inc., Canada , 439 465
Media	Falchuk, K. H., Fawcett, D. W., and Vallee, B. L. 1975. Competitive Antagonism of Cadmium and Zinc in the Morphology and Cell Division of <i>Euglena gracilis</i> . J.Submicrosc.Cytol. 7, 139 152
OM, pH	Farghali, K. A. 1998. Diurnal Variations of Chlorophyll and Dry Matter Contents of <i>Senna occidentalis</i> in Response to Zinc and Soil Moisture. Biol. Plant. 40[3], 419 424
FL	Fecencko, J. and Lozek, O. 1998. Maize grain yield formation in dependence on applied zinc doses and its content in soil [Czech]. Rostlinna Vyroba 44[1], 15 18.
OM, pH	Feigin, A., Bielorai, H., Shalhevet, J., Kipnis, T., and Dag, J. 1979. The Effectiveness of Some Crops in Removing Minerals from Soils Irrigated with Sewage Effluent. Prog Water Technol 11[4/5], 151 162
No Tox	Finch, A. H. and Kinnison, A. F. 1934. Zinc Treatment of Pecan Rosette. Arizona Univ. Agric. Ext. Serv. Circ.82 , 11 p.
No Conc	Fodor, L. 1998. Effect of Heavy Metals on Wheat and Maize Crop on Brown Forest Soil. Agrochem.Talajtan 47[1 4], 197 206.
No Dose	Fontes, P. C. R., Moreira, M. A., Fontes, R. L. F., and Cardoso, A. A. 1999. Effects of Zinc Fungicides and Different Zinc Fertilizer Application Methods on Soluble and Total Zinc in Potato Plant Shoots. Comm. Soil Sci. Plant Anal. 30[13/14], 1847 1859
Media	Fontes, R. and Cox, F. 1998. Iron Deficiency and Zinc Toxicity in Soybean Grown in Nutrient Solution with Different Levels of Sulfur. J. Plant Nutr. 21[8], 1715 1722
Media	Fontes, Renildes L. F. 1992. Zinc Toxicity in Soybeans as Affected by Plant Iron and Sulfur. PhD Thesis, North Carolina State University , 150
OM, pH	Forge, T. A., Berrow, M. L., Darbyshire, J. F., and Warren, A. 1993. Protozoan Bioassays of Soil Amended with Sewage Sludge and Heavy Metals, Using the Common Soil Ciliate <i>Colpoda steinii</i> . Biol. Fertil. Soils 16, 282 286
Not Avail	Freedman, J. 1977. Environmental Zinc Contamination and Plant Toxicity. Interface 6[3], 26 27
Media	Fulton, M. C. and Asher, C. J. 1997. Zinc Treatments Applied to Cassava (<i>Manihot esculenta</i> Crantz) Setts Changes Early Growth and Zinc Status of Plants. Aust. J. Exp. Agric. 37[7], 825 830
Media	Gabbrielli, R., Mattioni, C., and Vergnano, O. 1991. Accumulation Mechanisms and Heavy Metal Tolerance of a Nickel Hyperaccumulator. J. Plant Nutr. 14[10], 1067 1080
Media	Gadgil, R. L. 1969. Tolerance of Heavy Metals and the Reclamation of Industrial Waste. J Appl Ecol 6, 247 259
OM, pH	Gall, O. E. 1936. Zinc Sulphate Studies in the Soil. Citrus Ind. 17[1], 20 21
No Conc	Gall, O. E. and Barnette, R. M. 1940. Toxic Limits of Replaceable Zinc to Corn and Cowpeas Grown of Three Florida Soils. J. Am. Soc. Agron. 32, 23 32

OM, pH	Gammon, N. Jr. 1975. Persistence of ZnS in Leon Fine Sand and Its Relative Availability to Plants. Soil Crop Sci. Soc. Fla. Proc. 34, 52 54
Media	Geiger, G., Federer, P., and Sticher, H. 1993. Reclamation of heavy metal contaminated soils: field studies and germination experiments. J. Environ. Qual. 22[1], 201 207
FL	Gerzabek, M. H. and Patzelt, W. 1988. Effect of Increasing Zinc and Peat Levels on the Zinc Uptake by Corn (<i>Zea mays</i> L.) Grown in Nutrient Solution. Mitteilgn. Dtsch. Bodenkundl. Gesellsch. 56, 147 152
FL	Gerzabek, M. H. and Schaffer, K. 1989. Nickel and Zinc Uptake by <i>Lolium perenne</i> in Pot Experiment. Bodenkultur 40[3], 195 205
No Dur	Gilfillan, E. S., Page, D. S., Vallas, D., Gonzalez, L., Pendergast, E., Foster, J. C., and Hanson, S. A. 1985. Relationship Between Glucose 6 Phosphate Dehydrogenase and Aspartate Aminotransferase Activities, Scope for Growth and Body Burden of Ag, Cd, Cu, Cr, Pb and Zn in Populations of <i>Mytilus edulis</i> from a Polluted Estuary. In: F.J.Vernberg et al.(Eds.), Belle W.Baruch Library in Mar.Sci., No.13, Marine Pollution and Physiology: Recent Advances, Meeting, Nov.1 3, 1983, Mystic, CT, Univ.of South Carolina Press, Columbia, S.C. 107 127
Species	Gimeno Garcia, E., Andreu, V., and Boluda, R. 1995. Distribution of Heavy Metals in Rice Farming Soils. Arch. Environ. Contam. Toxicol. 29[2], 476 483
Mix	Gingell, S. M., Campbell, R., and Martin, R. 1976. The Effect of Zinc, Lead, and Cadmium Pollution on the Leaf Surface Microflora. Environ. Pollut. 11[1], 25 37
Mix	Gingrich, D. J., Petering, D. H., and Shaw III, C. F. 1984. Zinc and Cadmium Metabolism in <i>Euglena gracilis</i> : Metal Distribution in Normal and Zinc Deficient Cells. Mar. Environ. Res. 14[1 4], 89 102
Mix	Gintenreiter, S., Ortel, J., and Nopp, H. J. 1993. Bioaccumulation of Cadmium, Lead, Copper, and Zinc in Successive Developmental Stages of <i>Lymantria dispar</i> L. (Lymantriidae, Lepid): A Life Cycle Study. Arch.Environ.Contam.Toxicol. 25[1], 55 61
Species	Gintenreiter, S., Ortel, J., and Nopp, H. J. 1993. Effects of Different Dietary Levels of Cadmium, Lead, Copper, and Zinc on the Vitality of the Forest Pest Insect <i>Lymantria dispar</i> L. (Lymantriidae, Lepid). Arch. Environ. Contam. Toxicol. 62 66
Nut def	Giordano, P. M. and Mortvedt, J. J. 1974. Response of Several Rice Cultivars to Zn. Agron. J. 66, 220 223
OM , pH	Giordana, P. M. 1975. Effects of Municipal Wastes on Crop Yields and Uptake of Heavy Metals. J. Environ. Qual. 4, 394 399
Mix	Giordano, P. M., Mays, D. A., and Behel, A. D., Jr. 1979. Soil Temperature Effects on the Uptake of Cadmium and Zinc by Vegetables Grown on Sludge Amended Soil. J. Environ. Qual. 8[2], 233 236
Rev	Giordano, P. M. and Mortvedt, J. J. 1980. Zinc Uptake and Accumulation by Agricultural Crops. In: J.O.Nriagu (Ed.), Zinc in the Environment, Part II Health Effects, John Wiley and Sons, NY , 401 414
Media	Giordano, P. M., Noggle, J. C., and Mortvedt, J. J. 1974. Zinc Uptake by Rice as Affected by Metabolic Inhibitors and Competing Cations. Plant Soil 41, 637 646

Nut def	Giordano, P. M. and Mortvedt, J. J. 1972. Rice Response to Zn in Flooded and Nonflooded Soil. <i>Agron. J.</i> 64, 521 524
OM, pH	Girwani, A., Babu, R. Srihari, and Chandrasekhar, R. 1990. Response of marigold (<i>Tagetes erecta</i>) to growth regulators and zinc. <i>Indian J. Agric. Sci.</i> 60[3], 220 222
No Dur	Gish, C. D. and Christensen, R. E. 1973. Cadmium, Nickel, Lead and Zinc in Earthworms from Roadside Soil. <i>Environ. Sci. Technol.</i> 7[11], 1060 1062
Media	Godbold, D. L. and Huttermann, A. 1985. Effect of Zinc, Cadmium and Mercury on Root Elongation of <i>Picea abies</i> (Karst.) Seedlings and the Significance of These Metals to Forest Die Back. <i>Environ. Pollut.</i> 38, 375 381
Media	Godbold, D. L., Tischner, R., and Huttermann, A. 1987. Effects of Heavy Metals and Aluminum on the Root Physiology of Spruce (<i>Picea abies</i> Karst.) Seedlings. In: T.C.Hutchinson and K.M.Meema (Eds.), <i>Proc.of the NATO Advanced Research Workshop on Effects of Acidic Deposition on Forests, Wetlands, and Agricultural Ecosystems</i> , Held at Toronto, Canada, May 12 17, 1985, Springer Verlag, NY , 387 400
Media	Godbold, D. L., Schlegel, H., and Hutterman, S. 1985. Heavy Metals A Possible Factor in Spruce Decline. <i>VDI Berichte</i> 560, 703 716
Media	Godbold, D. L., Horst, W. J., Marschner, H., Collins, J. C., and Thurman, D. A. 1983. Root Growth and Zn Uptake by Two Ecotypes of <i>Deschampsia caespitosa</i> as Affected by High Zn Concentrations. <i>Z Pflanzenphysiol</i> 112, 315
OM, pH	Goh, T. B., Banerjee, M. R., Tu, S., and Burton, D. L. 1997. Vesicular Arbuscular Mycorrhizae Mediated Uptake and Translocation of P and Zn by Wheat in a Calcareous Soil. <i>Can. J. Plant Sci.</i> 77[3], 339 346
OM, pH	Goodall, M. J., Volz, S. A., Johnston, J. J., Hurlbut, D. B., Mauldin, R. E., Griffin, D. L., and Petty, E. E. 1998. Determination of Zinc Phosphide Residues in Corn (<i>Zea mays</i>) Grain, Fodder, and Forage. <i>Bull Environ Contam Toxicol</i> 60[6], 877 884
FL	Gorlach, Eugeniusz and Gambus, Florian. 1988. Copper and zinc effect on potassium, sodium, magnesium, and calcium uptake by Italian ryegrass (<i>Lolium multiflorum</i> Lam.). <i>Rocz. Glebozn.</i> 39[3], 251 255
Media	Gorsuch, J. W., Kringle, R. O., and Robillard, K. A. 1990. Chemical Effects on the Germination and Early Growth of Terrestrial Plants. In: W.Wang, J.W.Gorsuch., and W.R.Lower (Eds.), <i>Plants for Toxicity Assessment</i> , ASTM STP 1091, Philadelphia, PA , 49 58
OM, pH	Goto, S., Moriyama, K., Yoneyama, T., Kobayashi, Y., Mori, S., and Chino, M. 1993. Zn and delta15N in Plants Grown on the Soil Amended with Activated Sludge of Various Zn Levels. In: N.J.Barrow (Ed.), <i>Developments in Plant and Soil Sciences, Plant Nutrition from Genetic Engineering to Field Practice</i> , Kluwer Acad.Publ., Dordrecht, Netherlands 54, 771 774
Media	Graff, S., Berkus, M., Alberti, G., and Kohler, H. R. 1997. Metal Accumulation Strategies in Saprophagous and Phytophagous Soil Invertebrates: A Quantitative Comparison. <i>Biometals</i> 10[1], 45 53
Rev	Graham, R. D. and Rengel, Z. 1993. Genotypic Variation in Zinc Uptake and Utilization by Plants. <i>Dev. Plant Soil Sci.</i> 55, 107 118
OM	Grant, C. A. and Bailey, L. D. 1997. Effects of Phosphorus and Zinc Fertiliser Management on

Cadmium Accumulation in Flaxseed. *J. Sci. Food Agric.* 73[3], 307 314

OM	Grant, C. A. and Bailey, L. D. 1998. Nitrogen, Phosphorus and Zinc Management Effects on Grain Yield and Cadmium Concentration in Two Cultivars of Durum Wheat. <i>Can. J. Plant Sci.</i> 78[1], 63 70
Mix	Gray, N. F. 1988. Ecology of Nematophagous Fungi: Effect of the Soil Nutrients Nitrogen, Phosphorus, and Potassium and Seven Major Metals on Distribution. <i>Plant Soil</i> 108[2], 286 290
Media	Gregory, R. P. G. and Bradshaw, A. D. 1965. Heavy Metal Tolerance in Populations of <i>Agrostis tenuis</i> Sibth. and Other Grasses. <i>New Phytol.</i> 64, 131 143
OM, pH	Grewal, H. S., Graham, R. D., and Rengel, Z. 1996. Genotypic Variation in Zinc Efficiency and Resistance to Crown Rot Disease (<i>Fusarium graminearum</i> Schw. Group 1) in Wheat. <i>Plant Soil</i> 186[2], 219 226
OM, pH	Grewal, H. S. and Graham, R. D. Residual Effects of Subsoil Zinc and Oilseed Rape Genotype on the Grain Yield and Distribution of Zinc in Wheat. <i>Plant Soil</i> 207[1], 29 36
OM, pH	Grewal, H. S., Graham, R. D., and Stangoulis, J. 1998. Zinc Boron Interaction Effects in Oilseed Rape. <i>J. Plant Nutr.</i> 21[10], 2231 2243
Media	Grotz, N., Fox, T., Connolly, E., Park, W., Guerinot, M. L., and Eide, D. 1998. Identification of a Family of Zinc Transporter Genes from <i>Arabidopsis</i> that Respond to Zinc Deficiency. <i>Proc Natl Acad Sci U S A</i> 95[12], 7220 7224
Media	Gstoettner, E. M. and Fisher, N. S. 1997. Accumulation of Cadmium, Chromium, and Zinc by the Moss <i>Sphagnum papillosum</i> Lindle. <i>Water Air Soil Pollut.</i> 93, 321 330
Nut def	Gupta, V. K., Singh, C. P., and Relan, P. S. 1992. Effect of Zn Enriched Organic Manures on Zn Nutrition of Wheat and Residual Effect on Soybean. <i>Bioresour. Technol.</i> 42[2], 155 157
No COC	Gupta, U. and Chipman, E. W. 1976. Influence of Iron and pH on the Yield and Iron, Manganese, Zinc and Sulfur Concentrations of Carrots Grown on Acid <i>Sphagnum</i> Peat Soil. <i>Soil Sci</i> 44, 559 566
ERE	Gupta, V. K., Gupta, A. P., and Raj, H. 1983. Micronutrient Contents and Yield of Lentil and Maize as Influenced by Direct and Residual Application of Organic Manure and Zinc. <i>Indian J. Agric. Sci.</i> 53[9], 826 830
Media	Guyen, K., Duce, J. A., and De Pomerai, D. I. 1994. Evaluation of a Stress Inducible Transgenic Nematode Strain for Rapid Aquatic Toxicity Testing. <i>Aquat. Toxicol.</i> 29, 119 137
OM, pH	Hagemeyer, J., Lohrmann, D., and Breckle, S. W. 1993. Development of Annual Xylem Rings and Shoot Growth of Young Beech (<i>Fagus sylvatica</i> L.) Grown in Soil with Various Cd and Zn Levels. <i>Water Air Soil Pollut.</i> 69[3/4], 351 361
No Control	Haghiri, F. 1974. Plant Uptake of Cadmium as Influenced by Cation Exchange Capacity, Organic Matter, Zinc and Soil Temperature. <i>J. Environ. Qual.</i> 3, 180 183
Species	Hahne, H. C. H. and Kroontje, W. 1973. Significance of pH and Chloride Concentration on Behavior of Heavy Metal Pollutants: Mercury (II), Cadmium (II), Zinc (II), and Lead (II). <i>J. Environ. Qual.</i> 2[4], 444 450

Media	Halsall, D. M. 1977. Effects of Certain Cations on the Formation and Infectivity of Phytophthora Zoospores. 2. Effects of Copper, Boron, Cobalt, Manganese, Molybdenum and Zinc Ions. Can. J. Microbiol. 23[8], 1002 1010
Media	Halvorson, A. D. and Lindsay, W. L. 1977. The Critical Zn ²⁺ Concentration for Corn and the Nonabsorption of Chelated Zinc. Soil Sci. Soc. Am. J. 41[3], 531 534
Mix	Hamon, R., Wundke, J., McLaughlin, M., and Naidu, R. 1997. Availability of Zinc and Cadmium to Different Plant Species. Aust. J. Soil Res. 35[6], 1267 1277
Media	Hampp, R., Beulich, K., and Ziegler, H. 1976. Effects of Zinc and Cadmium on Photosynthesis CO ₂ Fixation and Hill Activity of Isolated Spinach Chloroplasts. Z. Pflanzenphysiol. 77, 336 344
Mix	Han, D. H. and Lee, J. H. 1996. Effects of Liming on Uptake of Lead and Cadmium by Raphanus sativa 52412. Arch. Environ. Contam. Toxicol. 31[4], 488 493
Mix	Han, S. H., Hyun, J. O., Lee, K. J., and Cho, D. H. 1998. Accumulation of Heavy Metals (Cd, Cu, Zn, and Pb) in Five Tree Species in Relation to Contamination of Soil Near Two Closed Zinc Mining Sites. J. Kor. For. Soc. 87[3], 466 474 (KOR) (ENG ABS)
ERE	Hanafi, M. M. and Sjaola, J. 1998. Cadmium and Zinc in Acid Tropical Soils: I. Soil Physico Chemical Properties Effect on their Adsorption 38464. Commun. Soil Sci. Plant Anal. 29[11 14], 1919 1931
OM, pH	Hanafi, M. M. and Maria, G. J. 1998. Cadmium and Zinc in Acid Tropical Soils: III. Response of Cocoa Seedlings in a Greenhouse Experiment. Commun. Soil Sci. Plant Anal. 29[11/14], 1949 1960
No Tox	Handreck, K. A. 1996. Zinc Toxicity from Tire Rubber in Soilless Potting Media. Commun. Soil Sci. Plant Anal. 27[13/14], 2615 2623
Mix	Hardiman, R. T., Jacoby, B., and Banin, A. 1984. Factors Affecting the Distribution of Cadmium, Copper and Lead and Their Effect upon Yield and Zinc Content in Bush Bean (Phaseolus vulgaris L.). Plant Soil 81, 17 27
Mix, Effl	Hartenstein, R., Neuhauser, E. F., and Narahara, A. 1981. Effects of Heavy Metal and Other Elemental Additives to Activated Sludge on Growth of Eisenia foetida. J. Environ. Qual. 10[3], 372 376
Media	Hartenstein, R., Neuhauser, E. F., and Collier, J. 1980. Accumulation of Heavy Metals in the Earthworm, Eisenia foetida. J. Environ. Qual. 9[1], 23 26
OM, pH	Hartley Whitaker, J., Cairney, J. W. G., and Meharg, A. A. 2000. Toxic Effects of Cadmium and Zinc on Ectomycorrhizal Colonization of Scots Pine (Pinus sylvestris L.) from Soil Inoculum. Environ. Toxicol. Chem. 19[3], 694 699
Media	Hawf, L. R. and Schmid, W. E. 1967. Uptake and Translocation of Zinc by Intact Plants. Plant Soil 27[2], 249 260
No Dur	Haydon, G. F. and Shaw, D. E. 1991. Zinc Accumulation in Monstera deliciosa near Brisbane. Australas. Plant Pathol. 20[4], 125 129
Mix	Helal, H. M., Haque, S. A., Ramadan, A. B., and Schnug, E. 1996. Salinity Heavy Metal Interactions as Evaluated by Soil Extraction and Plant Analysis 7826. Commun. Soil Sci. Plant Anal. 27[5 8], 1355 1361

Media	Helal, H. M., Schnug, E., Eickriede, A., and Fild, M. 1995. Uptake of Zinc by <i>Brassica napus</i> as Affected by Sulphur Supply (Zinkaufnahme durch <i>Brassica napus</i> in Abhangigkeit von der Schwefelversorgung). <i>Z. Pflanzenernahr. Bodenkd.</i> 158[1], 123 124
No Dose	Herawati, N., Rivai, I. F., Koyama, H., and Suzuki, S. 1998. Zinc Levels in Rice and in Soil According to the Soil Types of Japan, Indonesia, and China. <i>Bull. Environ. Contam. Toxicol.</i> 60[3], 402 408
Media	Herstein, U. and Jager, H. J. 1986. Tolerances of Different Populations of Three Grass Species to Cadmium and Other Metals. <i>Environ. Exp. Bot.</i> 26[4], 309 319
Mix	Hetrick, B. A. D., Wilson, G. W. T., and Figge, D. A. H. 1994. The Influence of Mycorrhizal Symbiosis and Fertilizer Amendments on Establishment of Vegetation in Heavy Metal Mine Spoil. <i>Environ. Pollut.</i> 86[2], 171 179
OM, pH	Heymannn Herschberg, L. 1956. Effects of Combined Zinc and Sulfur Applications on Zinc Deficiency in Orange Trees. <i>Ktavim</i> 6, 83 89
ERE	Hilton, B. R. and Zubriski, J. C. 1985. Effects of Sulfur, Zinc, Iron, Copper, Manganese, and Boron Applications on Sunflower Yield and Plant Nutrient Concentration. <i>Commun. Soil Sci. Plant Anal.</i> 16[4], 411 425
Mix	Hinesly, T. D., Jones, R. L., Ziegler, E. L., and Tyler, J. J. 1977. Effects of Annual and Accumulative Applications of Sewage Sludge on Assimilation of zinc and Cadmium by Corn (<i>Zea mays</i> L.) 52672. <i>Environ. Sci. Technol.</i> 11[2], 182 188
Mix	Hinesly, T. D., Alexander, D. E., Ziegler, E. L., and Barrett, G. L. 1978. Zinc and Cd Accumulation by Corn Inbreds Grown on Sewage Sludge Amended Soil. <i>Agron. J.</i> 70, 425 428
Mix	Hlusek, J., Juzl, M., and Zrust, J. 1997. Potato Yields and Cadmium, Nickel, and Zinc Contents in Tubers. <i>Rostl. Vyroba</i> 43[6], 263 267
OM, pH	Hoagland, D. R., Chandler, W. H., and Hibbard, P. L. 1935. Little Leaf or Rosette of Fruit Trees. V. Effect of Zinc on the Growth of Plants of Various Types in Controlled Soil and Water Culture Experiments. <i>Proc. Am. Soc. Hortic. Sci.</i> 33, 131 141
Species	Hodgson, J. F., Lindsay, W. L., and Trierweiler, J. F. 1966. Micronutrient Cation Complexing in Soil Solution: II. Complexing of Zinc and Copper in Displaced Solution from Calcareous Soils 52705. <i>Soil Sci.</i> 30, 723 726
Mix	Hopkin, S. P. and Martin, M. H. 1984. Assimilation of Zinc, Cadmium, Lead and Copper by the Centipede, <i>Lithobius variegatus</i> (Chilopoda). <i>J Appl Ecol</i> 21, 535 546
Mix	Hopkin, S. P. and Martin, M. H. 1985. Assimilation of Zinc, Cadmium, Lead, Copper and Iron by the Spider <i>Dysdera crocata</i> , a Predator of Woodlice. <i>Bull Environ Contam Toxicol</i> 34, 183 187
Mix	Hopkin, S. P. 1990. Species Specific Differences in the Net Assimilation of Zinc, Cadmium, Lead, Copper and Iron by the Terrestrial Isopods <i>Oniscus asellus</i> and <i>Porcellio scaber</i> . <i>J. Appl. Ecol.</i> 27(2), 460 474
No Dur	Hopkin, S. P. and Martin, M. H. 1982. The Distribution of Zinc, Cadmium, Lead and Copper Within the Woodlouse <i>Oniscus asellus</i> (Crustacea, Isopoda). <i>Oecologia (Berlin)</i> 54, 227
No Dur	Hopkin, S. P. and Martin, M. H. 1982. The Distribution of Zinc, Cadmium, Lead and Copper Within the Hepatopancreas of a Woodlouse. <i>Tissue & Cell</i> 14[4], 703 715

No Dur	Hopkin, S. P., Hardisty, G., and Martin, M. H. 1986. The Woodlouse Porcellio scaber as a Biological Indicator of Zinc, Cadmium, Lead and Copper Pollution. <i>Environ. Pollut.</i> 11[4], 271 290
Media	Hopkin, S. P. and Hames, C. A. C. 1994. Zinc, Among a 'Cocktail' of Metal Pollutants, is Responsible for the Absence of the Terrestrial Isopod Porcellio scaber from the Vicinity of a Primary Smelting Works. <i>Ecotoxicology</i> 3[1], 68 78
Media	Howard, B. and Simkiss, K. 1981. Metal Binding by Helix aspersa Blood. <i>Comp. Biochem. Physiol. A</i> 70, 559 561
OM, pH	Hylander, L. 1995. Changes in Plant Nutrient Content of Barley as a Result of Lime, Phosphorus, Manganese, Copper and Zinc Supplies on Three Swedish Mineral Soils in a Pot Experiment. <i>Swed. J. Agric. Res.</i> 25[3], 93 107
Mix	Ibekwe, A. M., Angle, J. S., Chaney, R. L., and Van, Berkum P. 1997. Enumeration and N ₂ Fixation Potential of Rhizobium Leguminosarum biovar trifolii Grown in Soil with Varying pH Values and Heavy Metal Concentrations. <i>Agric. Ecosyst. Environ.</i> 61, 103 111
Media	Ibekwe, A. M., Angle, J. S., Chaney, R. L., and Van Berkum P. 1998. Zinc and Cadmium Effects on Rhizobia and White Clover Using Chelator Buffered Nutrient Solution. <i>Soil Sci. Soc. Am. J.</i> 62[1], 204 211
Media	Ibekwe, A. M., Angle, J. S., Chaney, R. L., and Van Berkum, P. 1996. Zinc and Cadmium Toxicity to Alfalfa and Its Microsymbiont. <i>J. Environ. Qual.</i> 25[5], 1032 1040
Media	Imai, I. and Siegel, S. M. 1973. A Specific Response to Toxic Cadmium Levels in Red Kidney Bean Embryos. <i>Physiol.Plant.</i> 29, 118 120
OM, pH	Indulkar, B. S. and Malewar, G. U. 1991. Response of Rice (Oryza sativa) to Different Zinc Sources and Their Residual Effect on Succeeding Chickpea (Cicer arietinum). <i>Indian J. Agron.</i> 36[SUPPL], 5 9
OM, pH	Indulkar, B. S. and Malewar, G. U. 1994. Response of Sorghum (Sorghum bicolor) to Different Zinc Sources and Their Residual Effect on Succeeding Wheat (Triticum aestivum). <i>Indian J. Agron.</i> 39[3], 368 372
Media	Ireland, M. P. 1986. Effects of Wound Healing on zinc Distribution and Alkaline Phosphatase Activity of Helix aspersa (Gastropoda: Pulmonata). <i>J Mollusan Stud</i> 52, 169 173
Species	Ireland, M. P. 1982. Sites of Water, Zinc and Calcium Uptake and Distribution of These Metals After Cadmium Administration in Arion ater (Gastropoda: Pulmonata). <i>Comp. Biochem. Physiol. A</i> 73, 217 221
Media	Ishizuka, Y. and Ando, T. 1968. Interaction Between Manganese and Zinc in Growth of Rice Plants. <i>Soil Sci. Plant Nutr.</i> 14[5], 201 206
No Dose	Ismail, A. S. S. and Awad, F. 1986. Effect of Certain Ions on Growth and Uptake of Iron and Zinc by Barley Seedlings Grown on Alluvial Soil. <i>J. Plant Nutr.</i> 9[3 7], 297 306
OM, pH	Jackson, D. R., Selvidge, W. J., and Ausmus, B. S. 1978. Behavior of Heavy Metals in Forest Microcosms: II. Effects on Nutrient Cycling Processes. <i>Water Air Soil Pollut.</i> 10, 13 18
Rev	Janus, J. A., Van Beelen, P., Vaal, M. A., Senhorst, H. A. J., and Van de Guchte, C. 1996. A Further Look at Zinc: A Response to the Industry Addendum to the Integrated Criteria Document

Zinc. RIVM Rep.No.601014 012/RIZA 96.038, The Netherlands , 65 p.

Rev	Janus, J. A. 1993. Integrated Criteria Document Zinc: Ecotoxicity. Appendix to Report No.710401028 Integrated Criteria Document Zinc. RIVM Report Number 710401 028 , 83 p.
Media	Jaworska, M., Gorczyca, A., Sepiol, J., and Tomasik, P. 1997. Effect of Metal Ions on the Entomopathogenic Nematode <i>Heterorhabditis bacteriophora</i> Poinar (Nematode: Heterorhabditidae) Under Laboratory Conditions. <i>Water Air Soil Pollut.</i> 93, 157 166
No Control	Jenner, H. A. and Janssen Mommen, J. P. M. 1993. Duckweed <i>Lemna minor</i> as a Tool for Testing Toxicity of Coal Residues and Polluted Sediments. <i>Arch. Environ. Contam. Toxicol.</i> 25[1], 3 11
Media	Jentschke, G., Schlegel, H., and Godbold, D. L. 1991. The Effect of Aluminium on Uptake and Distribution of Magnesium and Calcium in Roots of Mycorrhizal Norway Spruce Seedlings. <i>Physiol. Plant.</i> 82, 266 270
No Data	Jha, A. N. and Chandel, A. S. 1988. Critical concentration of zinc for soybean (<i>Glycine max</i>) grown in calcareous soil of north Indian plains. <i>Indian J. Agric. Sci.</i> 58[11], 857 858
Species	John, M. K., VanLaerhoven, C. J., and Bjerring, J. H. 1976. Effect of a Smelter Complex on the Regional Distribution of Cadmium, Lead, and Zinc in Litters and Soil Horizons 53136. <i>Arch. Environ. Contam. Toxicol.</i> 4[4], 456 468
ERE	Johnson, M. S., McNeilly, T., and Putwain, P. O. 1977. Revegetation of Metalliferous Mine Spoil Contaminated by Lead and Zinc. <i>Environ. Pollut.</i> 12[4], 261 277
ERE	Johnston, J. C. 1933. Zinc Sulfate Promising New Treatment for Mottle Leaf. <i>Calif. Citrogr.</i> 18, 107, 116 118
No Dose	Jones, R., Prohaska, K., and Burgess, M. S. 1988. Zinc and Cadmium in Corn Plants Growing near Electrical Transmission Towers. <i>Water Air Soil Pollut.</i> 37, 355 363
Media	Jones, R. G., Sutcliffe, M., and Marshall, C. 1971. Physiological and Biochemical Basis for Heavy Metal Tolerance in Clones of <i>Agrostis tenuis</i> . In: <i>Recent Advances in Plant Nutrition</i> , Gordon & Breach, NY 2, 575 581
OM, pH	Jones, R. L., Hinesly, T. D., Ziegler, E. L., and Tyler, J. J. 1975. Cadmium and Zinc Contents of Corn Leaf and Grain Produced by Sludge Amended Soil. <i>J. Environ. Qual.</i> 4[4], 509 514
No Dur	Jones, W. G. and Walker, K. F. 1979. Accumulation of Iron, Manganese, Zinc and Cadmium by the Australian Freshwater Mussel <i>Velesunio ambiguus</i> and Its Potential as a Biological Monitor. <i>Aust. J. Mar. Freshw. Res.</i> 30[6], 741 752
Media	Joosse, E. N. G., Van Capelleveen, H. E., Van Dalen, L. H., and Van Diggelen, J. 1983. Effects of Zinc, Iron and Manganese on Soil Arthropods Associated Decomposition Processes. In: T.D.Lekkas (Ed.), <i>Heavy Metals in the Environment</i> , Volume 1, CEP, Edinburgh 1, 467 470
Media	Joosse, E. N. G. and Van, Vliet L. H. H. 1984. Iron, Manganese and Zinc Inputs in Soil and Litter near a Blast Furnace Plant and the Effects of Respiration of Woodlice. <i>Pedobiologia</i> 26[4], 249 255
Media	Joosse, E. N. G., Wulffraat, K. J., and Glas, H. P. 1981. Tolerance and Acclimation to Zinc in the Isopod <i>Porcellio scaber</i> Latr. In: <i>Proc.3rd Int.Conf.Heavy Metals in the Environment</i> , CEP Consultants, Amsterdam, Edinburgh, UK , 425 428

OM, pH	Jopony, M. and Young, S. 1993. Assessment of Lead Availability in Soils Contaminated by Mine Spoil. <i>Plant Soil</i> 151[2], 273 278
ERE	Jordan, M. J. 1975. Effects of Zinc Smelter Emissions and Fire on a Chestnut Oak Woodland. <i>Ecology</i> 56[1], 78 91
Species	Juma, N. G. and Tabatabai, M. A. 1977. Effects of Trace Elements on Phosphatase Activity in Soils. <i>Soil Sci. Soc. Am. J.</i> 41, 343 346
Species	Jung, Myung Chae and Thornton, Iain. 1997. Environmental Contamination and Seasonal Variation of Metals in Soils, Plants and Waters in the Paddy Fields around a Pb Zn Mine in Korea. <i>Science of the Total Environment</i> 198[2], 105 121
Media	Jyung, W. H. and Camp, M. E. 1976. The Effect of Zinc on the Formation of Ribulose Diphosphate Carboxylase in <i>Phaseolus vulgaris</i> . <i>Physiol. Plant.</i> 36, 350 355
No Conc	Khan, H. R., Faiz, B., Islam, K. R., Rahman, S., Adachi, T., and Ahmed, I. U. 1991. Effect of gypsum and zinc on the growth and yield of rice grown under saline water stress in coastal saline soil. <i>Int. J. Trop. Agric.</i> 9[3], 182 189
Mix	Kalachikov, V. A. 1991. Role of Zinc in Decreasing the Nitrophenol Toxicity of Soils 53257. <i>Pochvovedenie</i> [1], 94 104
No Dur	Kalachikov, V. A. 1991. The Role of Zinc in Eliminating Nitrophenol Toxicity in Soils. <i>Sov. Soil Sci.</i> 23[8], 47 58 (ENG TRANSL)
OM, pH	Kalbhor, H. B., Rasal, P. H., and Patil, P. L. 1988. Effects of Zn and Mn on Nodulation and Yield of Gram. <i>J. Maharashtra Agric. Univ.</i> 13[2], 213 214
OM, pH	Kalyanaraman, S. B. and Sivagurunathan, P. 1993. Effect of Cadmium, Copper and Zinc on the Growth of Blackgram. <i>J. Plant Nutr.</i> 16[10], 2029 2042
OM, pH	Kalyanaraman, S. B. and Sivagurunathan, P. 1994. Infrared Studies on the Effect of Zinc on Blackgram. <i>J. Plant Nutr.</i> 17[5], 851 857
ERE	Kanabo, I. A. K. and Gilkes, R. J. 1992. Low Contaminant Jarosite Waste as a Fertilizer Amendment 53277. <i>J. Environ. Qual.</i> 21[4], 679 684
No Conc	Kang, Yulin, Huang, Xinjiang, and Liu, Gengling. 1992. Possible zinc phytotoxicity to corn growth. <i>Zhongguo Nongye Kexue</i> 25[1], 58 67
No Dose	Karimian, N. 1995. Effect of Nitrogen and Phosphorus on Zinc Nutrition of Corn in a Calcareous Soil. <i>J. Plant Nutr.</i> 18[10], 2261 2271
OM, pH	Karimian, N. and Yasrebi, J. 1995. Prediction of Residual Effects of Zinc Sulfate on Growth and Zinc Uptake of Corn Plants Using Three Zinc Soil Tests. <i>Commun. Soil Sci. Plant Anal.</i> 26[1/2], 277 287
No Conc	Kashyap, J., Sharma, J. C., and Gupta, V. K. 1988. Influence on Zn Levels on Dry Matter Yield, Zn and P Concentration in Parts of Cotton Genotypes at Varying Growth Stages. <i>J. Indian Soc. Soil Sci.</i> 36[2], 386 388
ERE	Kayode, G. O. 1985. Responses of Yield, Components of Yield and Nutrient Content of Maize to Soil Applied Zinc in Tropical Rainforest and Savannah Regions. <i>J. Agric. Sci.</i> 105, 135 139

OM, pH	Keisling, T. C., Lauer, D. A., Walker, M. E., and Henning, R. J. 1977. Visual, Tissue and Soil Factors Associated with Zn Toxicity of Peanuts. <i>Agron. J.</i> 69[5], 765 769
No Dur	Kelly, M. G. and Whitton, B. A. 1989. Relationship Between Accumulation and Toxicity of Zinc in <i>Stigeoclonium</i> (Chaetophorales, Chlorophyta). <i>Phycologia</i> 28[4], 512 517
FL	Kersten, E., Lucchesi, A. A., and Gutierrez, L. E. 1993. Effect of boron and zinc on soluble carbohydrate content, total amino acids and rooting of plum (<i>Prunus salicina</i> Lindl.) branch cuttings. <i>Sci. Agric.</i> 50[1], 13 18
OM, pH	Khalil, M. A., Abdel Lateif, H. M., Bayoumi, B. M., and Van Straalen, N. M. 1996. Analysis of Separate and Combined Effects of Heavy Metals on the Growth of <i>Aporrectodea caliginosa</i> (oligochaeta;annelida) using the Toxic Unit Approach. <i>Appl. Soil Ecol.</i> 4[3], 213 219
OM, pH	Khalil, Z., El Daly, F. A., and Khalil, M. S. 1989. Effect of Zinc Sulphate and Manganese Chloride on Chlorophyll Content, Carbohydrate Components and Mineral Composition of Roselle Leaves (<i>Hibiscus sabdariffa</i> L.). <i>Egypt. J. Bot.</i> 32[1 2], 31 41
Media	Khan, D. H. and Frankland, B. 1984. Cellulolytic Activity and Root Biomass Production in Some Metal Contaminated Soils. <i>Environ. Pollut. Ser. A</i> 33, 63 74
OM, pH	Khan, H. R., Mcdonald, G. K., and Rengel, Z. 1998. Assessment of the Zn status of Chickpea by Plant Analysis. <i>Plant Soil</i> 198[1], 1 9
OM, pH	Khan, H. R., Mcdonald, G. K., and Rengel, Z. 1998. Chickpea genotypes differ in their sensitivity to zn deficiency. <i>Plant Soil</i> 198[1], 11 18
No Dose	Khan, H. R., Ahmed, I. U., and Blume, H. P. 1996. Effects of Gypsum and Zn on Uptake Ratios of Na, K and Growth Yield of Rice Grown on a Coastal Saline Soil. <i>Z. Pflanzenernahr. Bodenkd.</i> 159[4], 351 356
No Dose	Khan, H. R. 1991. Effects of Gypsum, Zinc and Saline Water on the Yields of and Nutrient Uptake by Rice in a Coastal Saline Soil. <i>Int. J. Trop. Agric.</i> 9[3], 225 233
OM	Khanda, C. M. and Dixit, L. 1996. Effect of Zinc and Nitrogen Fertilization on Yield and Nutrient Uptake of Summer Rice (<i>Oryza sativa</i>). <i>Indian J. Agron.</i> 41[3], 368 372
No Dose	Kim, N. D. and Fergusson, J. E. 1994. Seasonal Variations in the Concentrations of Cadmium, Copper, Lead and Zinc in Leaves of the Horse Chestnut (<i>Aesculus hippocastanum</i> L.) 53433. <i>Environ. Pollut.</i> 86[1], 89 97
Mix	Kim, S. J., Chang, A. C., Page, A. L., and Warneke, J. E. 1988. Relative Concentrations of Cadmium and Zinc in Tissue of Selected Food Plants Grown on Sludge Treated Soils 53434. <i>J. Environ. Qual.</i> 17[4], 568 573
Mix	King, L. D. and Morris, H. D. 1972. Land Disposal of Liquid Sewage Sludge: II. The Effect of Soil pH, Manganese, Zinc, and Growth and Chemical Composition of Rye (<i>Secale cereale</i> L.) 53448. <i>J. Environ. Qual.</i> 1[4], 425 429
No Tox	Kirchgessner, M. and Roth, H. P. 1980. Biochemical Changes of Hormones and Metalloenzymes in Zinc Deficiency. In: J.O.Nriagu (Ed.), <i>Zinc in the Environment.Part II: Health Effects</i> , Chapter 4, John Wiley & Sons, Toronto, Canada , 71 103
Rev	Kiss, T. and Osipenko, O. 1994. Metal Ion Induced Permeability Changes in Cell Membranes: A Minireview 53471. <i>Cellular and Molecular Neurobiology</i> 14[6], 781 789

OM	Kloke, A. and Egels, W. 1976. Effect of Excess Fertilization with Boron, Cobalt, Copper Manganese, and Zinc on the Content of These Elements in Soil and Plants. Dokl. Zarub. Uchastnikov Mezhdunar. Kongr. Miner. Udobr. , 8th 2[4/5], 115 121
ERE	Knight, B., Zhao, F. J., McGrath, S. P., and Shen, Z. G. 1997. Zinc and Cadmium Uptake by the Hyperaccumulator <i>Thlaspi caerulescens</i> in Contaminated Soils and Its Effects on the Concentration and Chemical Speciation of Metals in Soil Solution. Plant Soil 197[1], 71 78
OM, pH	Koehler, H. and Triebkorn, R. 1998. Assessment of the Cytotoxic Impact of Heavy Metals on Soil Invertebrates Using a Protocol Integrating Qualitative and Quantitative Components. Biomarkers 3[2], 109 127
Nut def	Kochar, R. K., Arora, B. R., and Nayyar, V. K. 1990. Effect of Sulfur and Zinc Application on Maize Crop. J. Indian Soc. Soil Sci. 38[2], 339 341
OM, pH	Kohl, K. I. 1997. Do <i>Armeria maritima</i> (Mill.) Willd. Ecotypes from Metalliferous Soils and Non metalliferous Soils Differ in Growth Response Under Zn Stress? A Comparison by a New Artificial Soil Method. J. Exp. Bot. 48[317], 1959
No Dose	Kong, L. S., Gao, P., Ren, T. X., and Hong, H. J. 1991. Characteristics of Plant Communities and Element Contents in Plants at Mengentaoligai Silver Lead Zinc Mine Area in Inner Mongolia. Acta Bot. Sin. 33[7], 529 541
No COC	Korayem, A. M. and El Sisi, A. G. 1989. Iron and Zinc as Activator Elements to Oxamyl Toxicity Against the Root Knot Nematode <i>Meloidogyne incognita</i> . Pak J Nematol 7[1], 27 32
Mix	Kowalska Pylka, H., Kot, A., Wiercinski, J., Kurska, K., Walkuska, G., and Cybulski, W. 1995. Lead, Cadmium, Copper and Zinc Content in Vegetables, Gooseberry Fruits and Soils from Gardening Plots of Lublin (Zawartosc Olowiu, Kadmu, Miedzi i Cynku w Warzywach, Owocach Agrestu Oraz Glebie Ogradow Dzialkowych Lublina) 58396. Roczn.Panstw.Zakl.Hig. 46[1], 3 12 (CZE) (ENG ABS)
Media	Kramarz, P. 1999. Dynamics of Accumulation and Decontamination of Cadmium and Zinc in Carnivorous Invertebrates. 2. The Centipede <i>Lithobius mutabilis</i> Koch. Bull. Environ. Contam. Toxicol. 63[4], 538 545
Species	Kramarz, P. 1999. Dynamics of Accumulation and Decontamination of Cadmium and Zinc in Carnivorous Invertebrates. 1. The Ground Beetle, <i>Poecilus cupreus</i> L. Bull. Environ. Contam. Toxicol. 63[4], 531 537
Rev	Krantz, B. A. and Brown, A. L. 1961. Zinc Fertilization of Field and Vegetable Crops in California. Agrichem. West 4[1], 5 6
Species	Krantzberg, G. and Stokes, P. M. 1985. Benthic Macroinvertebrates Modify Copper and Zinc Partitioning in Freshwater Sediment Microcosms. Can. J. Fish. Aquat. Sci. 42[9], 1465 1473
OM	Krebs, R., Gupta, S. K., Furrer, G., and Schulin, R. 1998. Solubility and Plant Uptake of Metals with and without Liming of Sludge amended Soils. J. Environ. Qual. 27[1], 18 23
pH	Kumar, D., Chauhan, R. P. S., Singh, B. B., and Singh, V. P. 1999. Response of Rice (<i>Oryza sativa</i>) to Zinc Sulphate Incubated and Blended with Organic Materials in Sodic Soil. Indian J. Agric. Sci. 69[6], 402 405
No Conc	Kumar, M. and Das, D. K. 1999. Yield and Storage Life of Onion (<i>Allium cepa</i> L.) as Affected by Zinc and Sulfur Application. Environ. Ecol. 17[3], 580 584

No Conc	Kushwaha, H. S., Mishra, M. K., and Tomar, R. A. S. 1992. Response of rice to nitrogen, phosphorus, potassium, and zinc on farmer's field. <i>Agric. Sci. Dig.</i> 12[1], 4 6
OM, pH	Lagerwerff, J. V. and Specht, A. W. 1970. Contamination of Roadside Soil and Vegetation with Cadmium, Copper, Lead, and Zinc in Soil and Vegetation in the Proximity of a Smelter. <i>Environ. Sci. Technol.</i> 4[7], 583 586
Not Avail	Lagerwerff, J. V. and Biersdorf, G. T. 1972. Interactions of Zinc with Uptake and Translocation of Cadmium in Radish. <i>New Phytol.</i> 5, 515 522
OM, pH	Lagerwerff, J. V. 1971. Uptake of Cadmium, Lead and Zinc by Radish from Soil and Air. <i>Soil Sci.</i> 111[2], 129 133
No Dur	Laivins, M., Henina, E., Kraukle, M., and Ventins, I. 1993. The Impact of the Saulkalne Lime Processing Facilities on the Biotic Diversity of Pine Forests. <i>Latv. Zinat. Akad. Vestis B</i> 7[552], 63 69
Media	Lambein, F., Haque, R., Khan, J. K., Kebede, N., and Kuo, Y. H. 1994. From Soil to Brain: Zinc Deficiency Increases the Neurotoxicity of Lathyrus sativus and may Affect the Susceptibility for the Motorneuron Disease Neurolathyrism. <i>Toxicon</i> 32[4], 461 466
OM, pH	Lambert, D. H. 1982. Response of Sweetgum to Mycorrhizae, Phosphorus, Copper, Zinc, and Sewage Sludge. <i>Can. J. For. Res.</i> 12, 1024 1027
No Tox	Lambert, D. H., Baker, D. E., and Cole, H., Jr. 1979. The Role of Mycorrhizae in the Interactions of Phosphorus with Zinc, Copper, and Other Elements. <i>Soil Sci. Soc. Am. J.</i> 43[5], 976 980
Mix	Lan, C. Y., Shu, W. S., and Wong, M. H. 1997. Revegetation of Lead/Zinc Mine Tailings at Shaoguan, Guangdong Province, China: Phytotoxicity of the Tailings 38602. <i>Global Environ. Biotechnol.</i> 119 130
Media	Lane, I. and Puckett, K. J. 1979. Responses of the Phosphatase Activity of the Lichen <i>Cladonia rangiferina</i> to Various Environmental Factors Including Metals. <i>Can. J. Bot.</i> 57, 1534 1540
Media	Lasat, Mitch M., Baker, Alan J. M., and Kochian, Leon V. 1998. Altered Zn compartmentation in the root symplasm and stimulated Zn absorption into the leaf as mechanisms involved in Zn hyperaccumulation in <i>Thlaspi caerulescens</i> . <i>Plant Physiol.</i> 118[3], 875 883
Species	Laskowski, R. and Hopkin, S. P. 1996. Accumulation of Zn, Cu, Pb, and Cd in the Garden Snail (<i>Helix aspersa</i>): Implications for Predators. <i>Environ. Pollut.</i> 91[3], 289 297
OM, pH	Lata, K. and Veer, B. 1990. Phytotoxicity of Zn Amended Soil to <i>Spinacia</i> and <i>Coriandrum</i> . <i>Acta Bot. Indica</i> 18[2], 194 198
No Conc	Lee, C. R. and Craddock, G. R. 1969. Factors Affecting Plant Growth in High Zinc Medium: II. Influence of Soil Treatments on Growth of Soybeans on Strongly Acid Soil Containing Zinc from Peach Sprays. <i>Agron. J.</i> 61, 565 567
Media	Lee, C. R., Sturgis, T. C., and Landin, M. C. 1976. A Hydroponic Study of Heavy Metal Uptake by Selected Marsh Plant Species. U.S.Army Eng Waterways Exp Stn Tech Rep.No.D 76 5 , 63
OM, pH	Lee, C. R., Sturgis, T. C., and Landin, M. C. 1967. Soil Factors Influencing the Growth of Cotton Following Peach Orchards. <i>Agron. J.</i> 59, 237 240
ERE	Leendertse, Peter C., Scholten, Martin C. T., and Van, Der Wal Jan Tjalling. 1996. Fate and effects

	of nutrients and heavy metals in experimental salt marsh ecosystems 53893. <i>Environ.Pollut.</i> 94[1], 19 29
OM, pH	Leonard, C. D., Stewart, I., and Edwards, G. 1957. Effectiveness of Different Zinc Fertilizers on Citrus. <i>Citrus Ind.</i> 38[2], 9 10, 12 15
OM, pH	Li, J., Zhou, M., Pessarakli, M., and Stroehlein, J. L. 1991. Cotton Response to Zinc Fertilizer. <i>Commun. Soil Sci. Plant Anal.</i> 22[15/16], 1689 1699
ERE	Liang, J. R. E. Karamanos and J. W. B. Stewart. 1991. Plant Availability of Zn Fractions in Saskatchewan Soils. <i>Can. J. Soil Sci.</i> 71[4], 507 517
No Dur	Lima, N. R. W., De, Lacerda L. D., Pfeiffer, W. C., and Fiszman, M. 1986. Temporal and spatial variability in zinc chromium cadmium and iron concentrations in oyster tissues <i>crassostrea brasiliensis</i> from sepetiba bay brazil. <i>Environ. Technol. Lett.</i> 7[8], 453 460
OM, pH	Lindner, R. C. and Luce, W. A. 1944. Zinc Treatment for the Control of Rosette or Little Leaf of Fruit Trees. <i>Proc. Washington State Hortic.Assoc.</i> 40, 154 160
ERE	Lingle, J. C. and Holmberg, D. M. 1957. The Response of Sweet Corn to Foliar and Soil Zinc Applications on a Zinc Deficient Soil. <i>Proc.Am.Soc.Hortic.Sci.</i> 70, 308 315
FL	Lipskaya, G. A. 1970. Accumulation of Chlorophyll in Sugar Beet Chloroplasts Under the Influence of Cobalt Applied Separately and Together with Boron, Manganese, Copper, Zinc and Molybdenum. <i>Agrokimiya</i> 2, 105 110 (RUS)
No Dur	Little, P. and Martin, M. H. 1972. A Survey of Zinc, Lead, and Cadmium in Soil and Natural Vegetation Around a Smelting Complex. <i>Environ. Pollut.</i> 3, 241 243
Nut Def	Liu, A. and Tang, C. 1999. Responses of Two Genotypes of <i>Lupinus albus</i> L. to Zinc Application on an Alkaline Soil. <i>J. Plant Nutr.</i> 22[3], 467 477
FL	Liu, Qing, Xu, Songlin, and Zhang, Bangcheng. 1991. Effects of zinc on the yield and quality of tobacco. <i>Turang (Nanjing)</i> 23[1], 35 36,49
FL	Liu, Wenlong, Wu, jingui, Lu, Xiaolong, and Xu, Yueding. 1995. Zinc Tolerance of Rice. <i>Guangdong Weiliang Yuansu Kexue (CHI)</i> 2[5], 6 11
FL	Liu, Wenzhang and Sun, Dianlan. 1990. Effect of Benzyladenine on Zinc Toxicity in Plants. <i>Hebei Shifan Daxue Xuebao, Ziran Kexueban</i> [1], 52 56
FL	Liu, Wenzhang and Sun, Dianlan. 1992. Effect of Zinc on the Growth of Cucumbers and Its Physiology. <i>Hebei Shifan Daxue Xuebao, Ziran Kexueban</i> 1, 81 84
Media	Loneragan, J. F., Kirk, G. J., and Webb, M. J. 1987. Translocation and Function of Zinc in Roots. <i>J. Plant Nutr.</i> 10[9 16], 1247 1254
Rev	Longnecker, N. E. and Robson (Ed.), A. D. 1993. Distribution and Transport of Zinc in Plants. <i>Dev. Plant Soil Sci.</i> 55, 79 91
Mix	Lorenz, S. E., Hamon, R. E., McGrath, S. P., Holm, P. E., and Christensen, T. H. 1994. Applications of Fertilizer Cations Affect Cadmium and Zinc Concentrations in Soil Solutions and Uptake by Plants. <i>Eur. J. Soil Sci.</i> 45[2], 159 165
Mix	Lounamaa, K. J. 1965. Studies on the Content of Iron, Manganese and Zinc in Macrolichens. <i>Ann.</i>

Media	Lu, W. P. and Kirkham, M. B. 1991. Genotypic Tolerance to Metals as Indicated by Ethylene Production. <i>Water Air Soil Pollut.</i> 57/58, 605 616
OM, pH	Lu, Z. G., Grewal, H. S., and Graham, R. D. 1998. Dry Matter Production and Uptake of Zinc and Phosphorus in Two Oilseed Rape Genotypes Under Differential Rates of Zinc and Phosphorus Supply. <i>J. Plant Nutr.</i> 21[1], 25 38
Media	Lui, D., Jiang, W., Wang, W., and Zhai, L. 1995. Evaluation of Metal Ion Toxicity on Root Tip Cells by the Allium Test. <i>Isr. J. Plant Sci.</i> 43, 125 133
No Conc	Luo, Y. and Rimmer, D. L. 1995. Zinc Copper Interaction Affecting Plant Growth on a Metal Contaminated Soil. <i>Environ. Pollut.</i> 88[1], 79 83
No Dur	Luoma, S. N., Cain, D., and Johansson, C. 1985. Temporal Fluctuations of Silver Copper and Zinc in the Bivalve <i>Macoma balthica</i> at Five Stations in South San Francisco Bay. <i>Hydrobiologia</i> 129[1], 109 120
No Tox	Luwe, Michael W. F., Nilsson, L. O., Huttel, R. F., and Johansson, U. T Eds. 1995. Distribution of Nutrients and Phytotoxic Metal Ions in the Soil and in Two Forest Floor Plant Species of a Beech (<i>Fagus sylvatica</i> L.) Stand. <i>Dev. Plant Soil Sci.</i> 168 169, 195 202
OM, pH	Lyszczyk, S. and Ruskowska, M. 1992. Effect of Zinc Excess on Carbonic Anhydrase Activity of Crops. <i>Acta Physiol. Plant.</i> 14[1], 35 39
FL	Lyszczyk, Stanislaw and Ruskowska, Maria. 1991. Different response of some plant species to excess of zinc. <i>Rocz. Glebozn.</i> 42[3 4], 215 221
Mix	Ma, W., Edelman, T., Van Beersum, I., and Jans, T. 1983. Uptake of Cadmium, Zinc, Lead, and Copper by Earthworms Near a Zinc Smelting Complex: Influence of Soil pH and Organic Matter. <i>Bull. Environ. Contam. Toxicol.</i> 30[4], 424 427
OM, pH	MacDonald, G. E., Peck, N. H., and Barnard, J. 1990. Snap Bean Plant Responses to Zinc Sulfate and Manganese Sulfate Fertilization on Tile drained Calcareous glacial till Soils. <i>J. Am. Soc. Hortic. Sci.</i> 115[4], 540 546
OM, pH	MacFarlane, G. R. and Burchett, M. D. 1999. Zinc Distribution and Excretion in the Leaves of the Grey Mangrove, <i>Avicennia marina</i> (Forsk.) Vierh. <i>Environ. Exp. Bot.</i> 41[2], 167 175
Media	Madan, V. K., Yadav, J. P. S., Taneja, A. D., and Kudesia, V. P. 1991. Fungicidal and nematicidal activity of pyrimidyl and thiazolyl substituted thioureas and their complexes of some bivalent metal. <i>Crop Res.</i> 4[1], 141 145
No Tox	Mahler, R. J. and Ryan, J. A. 1988. Cadmium Sulfate Application to Sludge Amended Soils: II. Relationship Between Treatment and Plant Available Cadmium, Zinc, and Manganese. <i>Commun. Soil Sci. Plant Anal.</i> 19[15], 1747 1770
ERE	Mandal, B., Das Pattanayak P.S., Samanta, A., and Chatterjee, A. K. 1996. Effect of Potassium Application on the Transformation of Zinc Fractions in Soil and on the Zinc Nutrition of Wetland Rice. <i>Z. Pflanzenernahr. Bodenkd.</i> 159[5], 413 417
No Dose	Mandal, B., Chatterjee, J., Hazra, G. C., and Mandal, L. N. 1992. Effect of Preflooding on Transformation of Applied Zinc and Its Uptake by Rice in Lateritic Soils. <i>Soil Sci.</i> 153[3], 250 257

OM, pH	Mandal, P. K. and Sarkar, K. P. 1994. Response of Jute Crop (<i>Corchorus capsularis</i> L.) to Chelated Zinc. <i>Environ. Ecol.</i> 12[4], 785 787
Species	Marigomez, J. A., Angulo, E., and Saez, V. 1986. Feeding and Growth Responses to Copper, Zinc, Mercury and Lead in the Terrestrial Gastropod <i>Arion ater</i> (Linne). <i>J Mollusc Stud</i> 52, 68 78
No Dose	Marina, M. and Enzo, O. 1983. Variability of Zinc and Manganese Concentrations in Relation to Sex and Season in the Bivalve <i>Donax trunculus</i> . <i>Mar. Pollut. Bull.</i> 14[9], 342 346
No Dur	Marino, F., Ligerio, A., and Diaz, C. 1996. Heavy Metals in Earthworms and Soils Around to a Thermic Power Station at as Pontes (La Coruna, NW Spain) 54354. <i>Boletin De La Real Sociedad Espanola De Historia Natural Seccion Biologica</i> 92[1 4], 65 73
No Dur	Marino, F., Ligerio, A., and Diaz Cosin, D. J. 1994. Heavy Metals in Several Earthworm Species Living in Serpentine Soils54353. <i>Nova Acta Cient. Compostel. (Biol.)</i> 5, 245 250
Mix	Marinussen, M. P. J. C., Van der Zee, S. E. A. T., De Haan, F. A. M., Bouwman, L. M., and Hefting, M. M. 1997. Heavy Metal (Copper, Lead, and Zinc) Accumulation and Excretion by the Earthworm, <i>Dendrobaena veneta</i> . <i>J. Environ. Qual.</i> 26[1], 278 284
No Tox	Marr, K., Fyles, H., and Hendershot, W. 1999. Trace Metals in Montreal Urban Soils and the Leaves of <i>Taraxacum officinale</i> . <i>Can. J. Soil Sci.</i> 79[2], 385 387
Rev	Marschner, H. 1993. Zinc Uptake from Soils. <i>Dev. Plant Soil Sci.</i> 55, 59 77
Media	Martensson, A. 1992. Assessing Anthropogenic Impact on Nitrogen Fixing Legumes. In: J.P.E.Anderson, et al.(Eds.), <i>Proc.of the Int.Symp.on Environmental Aspects of Pesticide Microbiology</i> , Aug.17 21, 1992, Sigtuna, Sweden , 121 126
Media	Mathys, W. 1973. Comparative Investigations of the Uptake of Zinc by Resistant and and Sensitive Populations of <i>Agrostis tenuis</i> Sibth. <i>Flora</i> 162, 492 499
OM, pH	Mathys, W. 1975. Enzymes of Heavy Metal Resistant and Non Resistant Populations of <i>Silene cucubalus</i> and Their Interaction with some Heavy Metals In Vitro and In Vivo. <i>Physiol. Plant</i> 33, 161 165
Media	Mathys, W. 1977. The Role of Malate, Oxalate, and Mustard Oil Glucosides in the Evolution of Zinc Resistance in Herbage Plants. <i>Physiol.Plant</i> 40, 130 136
Rev	Mathys, W. 1980. Zinc Tolerance by Plants. In: J.O.Nriagu (Ed.), <i>Zinc in the Environment.Part II: Health Effects</i> , Chapter 17, John Wiley & Sons, Toronto, Canada , 415 437
OM, pH	McFarland, M. L., Ueckert, D. N., Hons, F. M., and Hartmann, S. 1992. Selective Placement Burial of Drilling Fluids: II. Effects on Buffalograss and Fourwing Saltbush. <i>J. Environ. Qual.</i> 21[1], 140 144
Media	McGrath, J. F. and Robson, A. D. 1984. The Influence of Zinc Supply to Seedlings of <i>Pinus radiata</i> D. Don on the Internal Transport of Recently Absorbed Zinc. <i>Aust. J. Plant Physiol.</i> 11, 165 178
No Control	McGrath, S. P., Shen, Z. G., and Zhao, F. J. 1997. Heavy metal uptake and chemical changes in the rhizosphere of <i>Thlaspi caerulescens</i> and <i>Thlaspi ochroleucum</i> grown in contaminated soils. <i>Plant Soil</i> 188[1], 153 159
Mix	McKenna, I. M., Chaney, R. L., and Williams, F. M. 1993. The Effects of Cadmium and Zinc Interactions on the Accumulation and Tissue Distribution of Zinc and Cadmium in Lettuce and

	Spinach. Environ. Pollut. 79[2], 113 120
OM, pH	McKenzie, R. M. 1978. The Effect of Two Manganese Dioxides on the Uptake of Lead, Cobalt, Nickel, Copper and Zinc by Subterranean Clover. Aust. J. Soil Res. 16[2], 209 214
No Conc	McLaughlin, M. J., Maier, N. A., Freeman, K., Tiller, K. G., Williams, C. M. J., and Smart, M. K. 1995. Effect of Potassic and Phosphatic Fertilizer Type, Fertilizer Cd Concentration and Zinc Rate on Cadmium Uptake by Potatoes. Fert. Res. 40[1], 63 70
No Control	Mclay, L. D. and Robson, A. D. 1992. The Effect of Chlorsulfuron and Diclofop Methyl on the Uptake and Utilization of Zinc by Wheat. Aust. J. Agric. Res. 43[1], 59 66
ERE	McNaughton, S. J., Folsom, T. C., Lee, T., Park, F., Price, C., Roeder, D., Schmitz, J., and Stockwell, C. 1974. Heavy Metal Tolerance in Typha latifolia Without the Evolution of Tolerant Races. Ecology 55[5], 1163 1165
Media	Medici, J. C. and Taylor, M. W. 1967. Interrelationships Among Copper, Zinc and Cadmium in the Diet of the Confused Flour Beetle. J. Nutr. 93, 307 309
Score	Mehta, S. C., Poonia, S. R., and Panwar, B. S. 1994. Effect of Farmyard Manure, Gypsum and Zinc on the Performance of Maize in Sodic Soil. Crop Res. 8[3], 480 485.
ERE	Melton, J. R., Ellis, B. G., and Doll, E. V. 1970. Zinc, Phosphorus, and Lime Interactions with Yield and Zinc Uptake by Phaseolus vulgaris. Soil Sci. Soc. Am .Proc. 34[1], 91 93
Mix	Merrington, G., Winder, L., and Green, I. 1997. The Uptake of Cadmium and Zinc by the Bird Cherry Oat Aphid Rhopalosiphum padi (Homoptera: Aphididae) Feeding on Wheat Grown on Sewage Sludge Amended Agricultural Soil. Environ. Pollut. 96[1], 111 114
Media	Migula, P., Kafel, A., Kedzioriski, M., and Makonieczny, M. 1989. Combined and Separate Effects of Cadmium, Lead and Zinc on Growth and Feeding in the House Cricket (Acheta domesticus). Biologia (Bratisl.) 44[10], 911 921
OM, pH	Mikula, W. and Indeka, L. 1997. Heavy Metals in Allotment Gardens Close to an Oil Refinery in Plock. Water Air Soil Pollut. 96[1/4], 61 71
No Tox	Milbocker, D. C. 1974. Zinc Toxicity to Plants Grown in Media Containing Poly Rubber. Hortscience 9[6], 545 546
No Dose	Miles, L. J. and Parker, G. R. 1979. Heavy Metal Interaction for Andropogon scoparius and Rudbeckia hirta Grown on Soil from Urban and Rural Sites with Heavy Metals Additions. J. Environ. Qual. 8[4], 443 449
Rev	Miller, W. J. and Neathery, M. W. 1980. Manifestations of Zinc Abnormalities in Animals. In: J.O.Nriagu (Ed.), Zinc in the Environment.Part II: Health Effects, Chapter 3, John Wiley & Sons Inc., Canada , 61 70
Media	Millikan, C. R. 1948. Effect of Molybdenum on the Severity of Toxicity Symptoms in Flax Induced by an Excess of Either Manganese, Zinc, Copper, Nickel or Cobalt in the Nutrient Solution. J. Aust. Inst. Agric. Sci. 5, 180 186
Nut	Millikan, C. R. 1949. Effects of Flax of a Toxic Concentration of Boron, Iron, Molybenum, Aluminum, Copper, Zinc, Cobalt, or Nickel in the Nutrient Solution 54720. R Soc Victoria Proc 61, 25 42

Mix	Miner, G. S., Gutierrez, R., and King, L. D. 1997. Soil factors affecting plant concentrations of cadmium, copper, and zinc on sludge amended soils. <i>J. Environ. Qual.</i> 26[4], 989 994
OM, pH	Misra, A. 1992. Effect of Zinc Stress in Japanese Mint as Related to Growth, Photosynthesis, Chlorophyll Contents and Secondary Plant Products the Monoterpenes. <i>Photosynthetica</i> 26[2], 225 234
Effl	Mitchell, G. A., Jr. 1977. Relative Phytotoxicity, Uptake and Interactive Effects of Cd, Cu, Ni and Zn to Plants Grown on Soils Amended with Metal Enriched Sewage Sludge. PhD Thesis.Univ.of Calif.Riverside, CA 38[4], 95
ERE	Mitchell, C. D. and Fretz, T. A. 1977. Cadmium and Zinc Toxicity in White Pine, Red Maple, and Norway Spruce. <i>J. Am. Soc. Hortic. Sci.</i> 102[1], 81 84
Mix	Mitchell, G. A., Bingham, F. T., and Page, A. L. 1978. Yield and Metal Composition of Lettuce and Wheat Grown on Soils Amended with Sewage Sludge Enriched with Cadmium, Copper, Nickel and Zinc. <i>J. Environ. Qual.</i> 7[2], 165 171
OM, pH	Mitsui, S., Watanabe, I., Honma, M., and Honda, S. 1964. The Effect of Pesticides on Denitrification in Paddy Soil. <i>Soil Sci Plant Nutr</i> 10, 15 23
Mix	Moore, P. G., Rainbow, P. S., and Hayes, E. 1991. The Beachhopper <i>Orchestia gammarellus</i> (Crustacea: Amphipoda) as a Biomonitor for Copper and Zinc: North Sea Trials. <i>Sci Total Environ</i> 106, 221 238
Score	Moraghan, J. T. 1996. Zinc Concentration of Navy Bean Seed as Affected by Rate and Placement of Three Zinc Sources. <i>J.Plant Nutr.</i> 19[10/11], 1413 1422.
ERE	Moraghan, T., Sims, A., and Smith, L. 1999. Zinc in Wheat Grain as Affected by Nitrogen Fertilization and Available Soil Zinc. <i>J. Plant Nutr.</i> 22[4/5], 709 716
No Dur	Morgan, A. J. and Morris, B. 1982. The Accumulation and Intracellular Compartmentation of Cadmium, Lead, Zinc and Calcium in 2 Earthworm Species (<i>Dendrobaena rubida</i> and <i>Lumbricus rubellus</i>) Living in Highly Contaminated Soil. <i>Histochemistry</i> 75[2], 269 286
Mix	Morgan, J. E. and Morgan, A. J. 1988. Earthworms as Biological Monitors of Cadmium, Copper, Lead, and Zinc in Metalliferous Soils. <i>Environ. Pollut.</i> 54[2], 123 138
Mix	Morgan, J. E. and Morgan, A. J. 1993. Seasonal Changes In The Tissue Metal (Cadmium, Zinc, And Lead) Concentrations In Two Ecophysiologically Dissimilar Earthworm Species: Pollution Monitoring Implications 54833. <i>Environ. Pollut.</i> 82[1], 1 7
No Dur	Morgan, J. E. and Morgan, A. J. 1990. The Distribution of Cadmium, Copper, Lead, Zinc and Calcium in the Tissues of the Earthworm <i>Lumbricus rubellus</i> Sampled from One Uncontaminated and Four Polluted Soils. <i>Oecologia</i> 84[4], 559 566
No Dur	Morgan, J. E. and Morgan, A. J. 1989. Zinc Sequestration by Earthworm Annelida oligochaeta Chloragocytes an In Vivo Investigation Using Fully Quantitative Electron Probe X Ray Micro Analysis. <i>Histochemistry</i> 90[5], 405 411
No Tox	Mowry, H. and Camp, A. F. 1934. A Preliminary Report on Zinc Sulfate as a Corrective for Bronzing of Tung Trees. <i>Fla. Univ. Agric. Exp. Sta. Bull.</i> No.273 , 3 13
Media	Mukhi, A. K. and Shukla, U. C. 1991. Effect of S and Zn on Yield and Their Uptake in Rice in Submerged Soil Conditions. <i>J. Indian Soc. Soil Sci.</i> 39[4], 730 734

Nut def	Muralidharudu, Y. 1991. Studies on availability of zinc applied through chelated forms to rice. J. Indian Soc. Soil Sci. 39[1], 114 117
OM, pH	Muramoto, S., Nishizaki, H., and Aoyama, I. 1991. Changes in Concentration of Cadmium, Zinc and Iron in Glutinous and Non Glutinous Rice for Cadmium Sulfide with or Without Calcium Carbonate. Ber. Ohara Inst. Landwirtschaft. Biol. Okayama Univ. 20, 11 18
OM, pH	Murugesan, K. 1995. Influence of Zinc on the Growth and Yield of Groundnut and Its Effect on Microbial Population. J. Ecotoxicol. Environ .Monit. 5[1], 15 18
FL	Nakabayashi, Kazushige and Takahashi, Kinzi. 1989. Effect of nutrient concentration and zinc concentration on cucumber growth and yields in rockwool culture. Nippon Dojo Hiriyogaku Zasshi 60[4], 366 370
FL	Nakani, D. V. and Korsak, M. N. 1976. Effects of Chromium, Cadmium, and Zinc on the Rate of Photosynthesis in Short Term Experiments. Biol. Nauki (Mosc.) 19, 84 86
No Conc	Narwal, R. P. M. Singh J. P. Singh and D. J. Dahiya. 1993. Cadmium Zinc Interaction in Maize Grown on Sewer Water Irrigated Soil. Arid Soil Res. Rehabil. 7, 125 131
ERE	Narwal, R. P. and Singh, M. 1993. Effect of Cadmium and Zinc Application on Quality of Maize. Indian J. Plant Physiol. 36[3], 170 173
Mix	Narwal, R. P. and Singh, B. R. 1998. Effect of Organic Materials on Partitioning, Extractability and Plant Uptake of Metals in an Alum Shale Soil. Water Air Soil Pollut. 103[1/4], 405 421
Mix	Nash, T. H. 1975. Influence of Effluents from a Zinc Factory on Lichens 55024. Ecol. Monogr. 45[2], 183 198
No Control	Nayak, A. K. and Gupta, M. L. 1995. Phosphorus, Zinc and Organic Matter Interaction in Relation to Uptake, Tissue Concentration and Absorption Rate of Phosphorus in Wheat. J. Indian Soc. Soil Sci. 43[4], 633 636
OM, pH	Nayak, R., Chauhan, R. P. S., and Singh, G. 1997. Effect of Nitrogen and Zinc on Wheat (Triticum aestivum) Yield and Nutrients Uptake Under Partially Reclaimed Sodic Soil. Indian J.Agron. 42[2], 293 296
Mix	Naylor, L. M., Barmasse, M., and Loehr, R. C. 1987. Uptake of Cadmium and Zinc by Corn on Sludge Treated Soils. Bio.Cycle , 37 41
FL	Neite, H., Wittig, R., and Kuttler (Ed.), W. 1989. Lead and Zinc Contents in Soil and Plants of Beech Forests from North Rhine westphalia (Blei und Zinkgehalte in Boden und Pflanzen einiger Buchenwalder Nordrhein Westfalens). Verh.Ges.Oekol. 18, 425 429
pH, OM	Neuhauser, E. F., Malecki, M. R., and Loehr, R. C. 1984. Growth and Reproduction of the Earthworm Eisenia fetida After Exposure to Sublethal Concentrations of Metals. Pedobiologia 27, 89 97
Media	Neuhauser, E. F., Malecki, M. R., and Loehr, R. C. 1983. Methods Using Earthworms for the Evaluation of Potentially toxic Materials in Soils. In: R.A.Conway and W.P.Gulledge (Eds.), Hazardous and Industrial Solid Waste Testing, Volume 2, ASTM STP 805, Philadelphia, PA , 313 320
Media	Norvell, W. A. and Welch, R. M. 1993. Growth and Nutrient Uptake by Barley (Hordeum vulgare L. cv Herta): Studies Using an N (2 Hydroxyethyl)Ethylenedinitrilotriacetic Acid Buffered

	Nutrient Solution Technique. I. Zinc Ion Requirements. <i>Plant Physiol.</i> 101, 619 625
Mix	Nuorteva, P., Witkowski, Z., and Nuorteva, S. L. 1987. Chronic Damage by Tortrix Viridana l. Lepidoptera Tortricidae Related to the Content of Iron, Aluminum, Zinc, Cadmium and Mercury in Oak Leaves in Niepolomice Forest, Poland. <i>Ann. Entomol. Fenn.</i> 53[1], 36 38
pH	Nyarai Horvath, F., Szalai, T., Kadar, I., and Csatho, P. 1997. Germination Characteristics of Pea Seeds Originating from a Field Trial Treated with Different Levels of Harmful Elements. <i>Acta Agron.Hung.</i> 45[2], 147 154
OM, pH	Nylund, R. E. 1952. The Response of Onions to Soil and Foliar Applications of Manganese and to Soil Applications of Other Trace Elements. <i>Proc. Am. Soc. Hortic. Sci.</i> 60, 283 285
Media	Ohki, K. 1977. Critical Zinc Levels Related to Early Growth and Development of Determinate Soybeans. <i>Agron. J.</i> 69, 969 974
Media	Ohki, K. 1976. Effect of Zinc Nutrition on Photosynthesis and Carbonic Anhydrase Activity in Cotton. <i>Physiol. Plant.</i> 38, 300 304
Media	Ohki, K. 1978. Zinc Concentration in Soybean as Related to Growth, Photosynthesis, and Carbonic Anhydrase Activity. <i>Crop Sci.</i> 18, 79 82
Media	Okamoto, K., Suzuki, M., Fukanim, M., Toda, S., and Fuwa, K. 1977. Heavy Metal Tolerance of Penicillium Ochro Chloron II. Uptake of Heavy Metals by Copper Tolerant Fungus Penicillium Ochro Chloron. <i>Agric. Biol. Chem.</i> 41, 17 22
ERE	Oliver, D. P., Wihelm, N. S., McFarlane, J. D., Tiller, K. G., and Cozens, G. D. 1997. Effect of Soil and Foliar Applications of Zinc on Cadmium Concentration in Wheat Grain. <i>Aust .J. Exp. Agric.</i> 37[6], 677 681
ERE	Oliver, D. P., Hannam, R., Tiller, K. G., Wilhelm, N. S., Merry, R. H., and Cozens, G. D. 1994. Heavy Metals in the Environment. The Effects of Zinc Fertilization on Cadmium Concentration in Wheat Grain. <i>J. Environ. Qual.</i> 23[4], 705 711
ERE	Orphanos, P. I. 1975. Spray Application of Zinc to Young Apple Trees. <i>Hortic. Res.</i> 15, 23 30
OM, pH	Osborne, L. D. and Robson, A. D. 1992. Duration of Zinc Uptake Inhibition by Chlorsulfuron in Wheat. <i>Aust .J. Agric. Res.</i> 43[5], 1169 1174
No Control	Oste, L. A., Schroder, T. J., Bakker, S., Oppenheimer, M., and Lexmond, Th. 1998. In Situ Immobilization of Heavy Metals in Contaminated Soils: Effects on Plants and Earthworms55314. <i>Contam.Soil '98, Proc.6th Int.FZK/TNO Conf.</i> 2, 1201 1202
OM, pH	Otte, M. L., Rozema, J., Koster, L., Haarsma, M. S., and Broekman, R. A. 1989. Iron plaque on roots of Aster tripolium L.: interaction with zinc uptake 55324. <i>New Phytol.</i> 111[2], 309 317
Mix	Ozores Hampton, M., Hanlon, E., Bryan, H., and Schaffer, B. 1997. Cadmium, Copper, Lead, Nickel and Zinc Concentrations in Tomato and Squash Grown in MSW Compost Amended Calcareous Soil. <i>Compost Sci. Util.</i> 5[4], 40 45
Media	Paivoke, A. 1983. Long Term Effects of Zinc on the Growth and Development, Chlorophyll Content and Nitrogen Fixation of the Garden Pea. <i>Ann. Bot. Fenn.</i> 20[2], 205 213
Media	Paivoke, A. 1983. The Short Term Effects of Zinc on the Growth, Anatomy and Acid Phosphatase of Pea Seedlings. <i>Ann. Bot. Fenn.</i> 20[2], 197 203

ERE	Panda, R. and Sahu, S. K. 1999. Respiratory and Excretory Activity of <i>Drawida willsi</i> (<i>Oligochaeta</i>) in Zinc Applied Soil. <i>Environ. Ecol.</i> 17[2], 383 387
OM, pH	Paoletti, M. G., Sommaggio, D., Petruzzelli, G., Pezzarossa, B., and Barbafieri, M. 1995. Soil Invertebrates As Monitoring Tools For Agricultural Sustainability. <i>Polskie Pismo Entomologiczne</i> 64[1 4], 113 122
Media	Parker, D. R. 1993. Novel Nutrient Solutions for Zinc Nutrition Research: Buffering Free Zinc ²⁺ with Synthetic Chelators and P with Hydroxyapatite. <i>Plant Nutr.</i> 54, 677 680
Media	Parker, D. R. 1997. Responses of Six Crop Species to Solution Zinc 2+ Activities Buffered with HEDTA. <i>Soil Sci. Soc. Am. J.</i> 61[1], 167 176
ERE	Parker, M. B., Gaines, T. P., Walker, M. E., Plank, C. O., and Davis Carter, J. G. 1990. Soil Zinc and pH Effects on Leaf Zinc and the Interaction of Leaf Calcium and Zinc on Zinc Toxicity of Peanuts. <i>Commun. Soil Sci. Plant Anal.</i> 21[19/20], 2319 2332
Media	Patel, P. M., Wallace, A., and Mueller, R. T. 1976. Some Effects of Copper, Cobalt, Cadmium, Zinc, Nickel and Chromium on Growth and Mineral Element Concentration in <i>Chrysanthemum</i> . <i>J. Am. Soc. Hortic. Sci.</i> 101[5], 553 556
Media	Patra, J., Lenka, M., and Panda, B. B. 1994. Tolerance and Co Tolerance of the Grass <i>Chloris barbata</i> sw. to Mercury, Cadmium and Zinc. <i>New Phytol.</i> 128[1], 165 171
FL	Pavlikova, D., Tlustos, P., Szakova, J., and Balik, J. 1997. The Effect of Application of Potassium Humate on the Content of Cadmium, Zinc and Arsenic in Plants. <i>Rostl. Vyroba</i> 43[10], 481 486
Media	Pawert, M., Triebkorn, R., Graff, S., Berkus, M., Schulz, J., and Koehler, H. 1996. Cellular Alterations in Collembolan Midgut Cells as a Marker of Heavy Metal Exposure: Ultrastructure and Intracellular Metal Distribution. <i>Sci. Total Environ.</i> 181[3], 187 200
ERE	Payne, G. G., Martens, D. C., Winarko, C., and Perera, N. F. 1988. Form and Availability of Copper and Zinc Following Long Term Copper Sulfate and Zinc Sulfate Applications. <i>J. Environ. Qual.</i> 17[4], 707 711
Media	Pearson, J. N., Rengel, Z., and Graham, R. D. 1999. Regulation of Zinc and Manganese Transport into Developing Wheat Grains Having Different Zinc and Manganese Concentrations 55484. <i>J. Plant Nutr.</i> 22[7], 1141 1152
ERE	Peles, J. D., Brewer, S. R., and Barrett, G. W. 1996. Metal Uptake by Agricultural Plant Species Grown in Sludge amended Soil Following Ecosystem Restoration Practices. <i>Bull. Environ. Contam. Toxicol.</i> 57[6], 917 923
Mix	Pepper, I. L., Bezdicek, D. F., Baker, A. S., and Sims, J. M. 1983. Silage Corn Uptake of Sludge Applied Zinc and Cadmium as Affected by Soil pH. <i>J. Environ. Qual.</i> 12[2], 270 275
Rev	Petering, H. G. 1978. Some Observations on the Interaction of Zinc, Copper, and Iron Metabolism in Lead and Cadmium Toxicity. <i>Environ. Health Perspect.</i> 25, 141 145
Media	Peterson, P. J. 1969. The Distribution of Zinc 65 in <i>Agrostis tenuis</i> Sibth. and <i>A. stolonifera</i> L. Tissues. <i>J. Exp. Bot.</i> 20[65], 863 875
No Dur	Pierzynski, G. M. and Schwab, A. P. 1993. Bioavailability of Zinc, Cadmium, and Lead in a Metal Contaminated Alluvial Soil. <i>J. Environ. Qual.</i> 22[2], 247 254

ERE	Piha, M. I., Vallack, H. W., Reeler, B. M., and Michael, N. 1995. A Low Input Approach to Vegetation Establishment on Mine and Coal Ash Wastes in Semi arid Regions. I. Tin Mine Tailings in Zimbabwe. <i>J. Appl. Ecol.</i> 372 381
Mix	Pilgrim, W. 1995. Lead, Cadmium, Arsenic, and Zinc in the Ecosystem Surrounding the Belledune Lead Smelter. Gov. Rep. Announce. Index [24]
FL	Piotrowska, Maria, Dudka, Stanislaw, and Wiacek, Krystyna. 1992. Effect of Different Doses of Trace Metals on Yields and Concentrations of These Elements in Corn (<i>Zea mays</i> L.). Part I. Cadmium and Zinc. <i>Arch. Ochr. Srodowiska</i> [2], 135 143 (RUS)
No Control	Pizl, V. and Sterzynska, M. 1991. The Influence of Urbanization on the Earthworm Infection by Monocystid Gregarines. <i>Fragm Faun (Warsaw)</i> 35[9 14], 203 212
OM, pH	Polson, D. E. and Adams, M. W. 1970. Differential Reponse of Navy Beans (<i>Phaseolus vulgaris</i> L.) to Zinc. I. Differential Growth and Elemental Composition at Excessive Zn Levels. <i>Agron. J.</i> 62, 557 560
Media	Posthuma, L. 1990. Genetic Differentiation Between Populations of <i>Orchesella cincta</i> (Collembola) from Heavy Metal Contaminated Sites. <i>J Appl Ecol</i> 27, 609 622
Mix	Posthuma, L., Boonman, H., Mogo, F. C., and Baerselman, R. 1994. Heavy Metal Toxicity in <i>Eisenia andrei</i> Exposed in Soils from a Gradient Around a Zinc Smelter (Budel), and Comparison with Toxic Effects in OECD Artificial Soil 55688. RIVM Rep.No.719102 033, The Netherlands , 16
No Data	Posthuma, L. and Notenboom, J. 1996. Toxic Effects of Heavy Metals in Three Worm Species Exposed in Artificially Contaminated Soil Substrates and Contaminated Field Soils. RIVM Report No.71902048, National Inst.of Public Health and Environ., Bilthoven, Netherlands , 79
Media	Powell, M. J., Davies, M. S., and Francis, D. 1988. Effects of Zinc on Meristem Size and Proximity of Root Hairs and Xylem Elements to Root Tip in a Zinc Tolerant and a Non Tolerant Cultivar of <i>Festuca rubra</i> L. <i>Ann.Bot.</i> 61, 723 726
ERE	Pradhan, S. K., Sarkar, S. K., Gupta, B. N., Tripathi, S. N., and Samanta, B. K. 1999. Effect of Boron, Zinc and Iron on the Incidence of Wilt <i>Fusarium udum</i> Bulter f. sp. <i>crotalariae</i> (Kulkarni) Padwick and Top Shoot Borer (<i>Cydia tricenra</i> Meyr.) of Sunnhemp (<i>Crotalaria juncea</i> Linn). <i>Environ. Ecol.</i> 17[1], 176 179
Nut Def	Prasad, B. J. Sarangthem and K. C. Choudhary. 1995. Transformation and Availability of Applied Zinc to Maize in Calcareous Soil. <i>J .Indian Soc .Soil Sci.</i> 43[1], 84 89
Mix	Prasad, Jagdish and Ram, H. 1997. Effect of Zinc and Copper and Rhizobium Inoculation on Manganese Uptake in Mungbean 55725. <i>Indian J. Agric. Chem.</i> 30[2&3], 109 110
ERE	Premi, P. R. and Cornfield, A. H. 1969. Effects of Addition of Copper, Manganese, Zinc and Chromium Compounds on Ammonification and Nitrification During Incubation of Soil. <i>Plant Soil</i> 31[2], 345 352
Species	Premi, P. R. and Cornfield, A. H. 1970. Effects of Copper, Zinc and Chromium on Immobilization and Subsequent Re Mobilization of Nitrogen During Incubation of Soil Treated with Sucrose 58471. <i>Geoderma</i> 3, 233 237
Media	Puckett, K. J., Nieboer, E., Gorzynski, M. J., and Richardson, D. H. S. 1973. The Uptake of Metal Ions by Lichens: A Modified Ion Exchange Process. <i>New Phytol.</i> 72, 329 342

OM, pH	Rabitsch, W. B. 1995. Metal Accumulation in Arthropods near a Lead/Zinc Smelter in Arnoldstein, Austria. II. Formicidae 55795. Environ. Pollut. 90[2], 239 247
No Dur	Rabitsch, W. B. 1995. Metal Accumulation in Arthropods Near a Lead/Zinc Smelter in Arnoldstein, Austria. I 55796. Environ. Pollut. 90[2], 221 237
No Dur	Rabitsch, W. B. 1995. Metal Accumulation in Arthropods near a Lead/Zinc Smelter in Arnoldstein, Austria. III. Arachnida. Environ. Pollut. 90[2], 249 257
ERE	Raj, H. and Gupta, V. K. 1986. Influence of Organic Manures and Zinc on Wheat Yield and Zn Concentration in Wheat. Agric. Wastes 16, 255 263
No Dose	Rajan, A. R. 1994. Zinc Uptake and Utilisation in Wetland Rice as Influenced by Zinc Sources. J. Nucl. Agric. Biol. 23[1], 61 63
OM, pH	Rajput, A. L. 1997. Effect of Nitrogen and Zinc Split Application on Wheat (<i>Triticum aestivum</i>) and Their Residual Effect on Rice (<i>Oryza sativa</i>). Indian J. Agron. 42[1], 22 25
OM, pH	Rajput, A. L., Singh, D. P., and Singh, S. P. 1995. Effect of Soil and Foliar Application of Nitrogen and Zinc with Farmyard Manure on Late Sown Wheat (<i>Triticum aestivum</i>). Indian J. Agron. 40[4], 598 600
Mix	Ramachandran, V. and D'souza, T. J. 1998. Plant uptake of cadmium, zinc, and manganese in soils amended with sewage sludge and city compost 55821. Bull. Environ. Contam. Toxicol. 61[3], 347 354
Media	Ramanujam, M. P. and Leena, G. D. 1992. Response of two peanut cultivars to pretreatment of seeds with zinc and molybdenum. Geobios (Jodhpur) 19[2 3], 121 123
No Control	Randhawa, H. S. and Singh, S. P. 1995. Zinc Fractions in Soils and Their Availability to Maize. J. Indian Soc. Soil Sci. 43[2], 293 294
OM, pH	Rashid, A., Rafique, E., Bughio, N., and Yasin, M. 1997. Micronutrient Deficiencies in Rainfed Calcareous Soils of Pakistan. IV. Zinc Nutrition of Sorghum. Commun. Soil Sci. Plant Anal. 28[6/8], 455 467
Media	Rateaver, B. 1990. The Zinc Link: Seaweed for Tree Nutrition. California Grower 14[10], 31, 33
OM, pH	Rattan, R. K. and Shukla, L. M. 1991. Influence of different zinc carriers on the utilization of micronutrients by rice. J. Indian Soc. Soil Sci. 39[4], 808 810
Media	Rausser, W. E. 1978. Early Effects of Phytotoxic Burdens of Cadmium, Cobalt, Nickel and Zinc in White Beans. Can. J. Bot. 56, 1744 1749
Media	Rausser, W. E. and Dumbroff, E. B. 1981. Effects of Excess Cobalt, Nickel and Zinc on the Water Relations of <i>Phaseolus vulgaris</i> . Environ. Exp. Bot. 21[2], 249 255
No Conc	Reboredo, F. 1994. Interaction Between Copper and Zinc and Their Uptake by <i>Halimione portulacoides</i> (L.) Aellen. Bull. Environ. Contam. Toxicol. 52[4], 598 605.
Media	Reinecke, A. J. and Reinecke, S. A. 1996. The Influence of Heavy Metals on the Growth and Reproduction of the Compost Worm <i>Eisenia fetida</i> (Oligochaeta). Pedobiologia 40[5], 439 448
Media	Reinecke, A. J., Reinecke, S. A., and Lambrechts, H. 1997. Uptake and Toxicity of Copper and Zinc for the African Earthworm, <i>Eudrilus eugeniae</i> (Oligochaeta). Biol. Fertil. Soils 24[1], 27 31

OM, pH	Ren, F., Liu, T., Liu, H., and Hu, B. 1993. Influence of Zinc on the Growth, Distribution of Elements, and Metabolism of One Year Old American Ginseng Plants. <i>J. Plant Nutr.</i> 16[2], 393 405
OM, pH	Rengel, Z. and Graham, R. D. 1995. Importance of Seed Zn Content for Wheat Growth on Zn Deficient Soil: I. Vegetative Growth. <i>Plant Soil</i> 173[2], 259 266
OM, pH	Rengel, Z. and Graham, R. D. 1995. Importance of Seed Zn Content for Wheat Growth on Zn Deficient Soil: II. Grain Yield. <i>Plant Soil</i> 173[2], 267 274
Media	Rengel, Z. and Graham, R. D. 1995. Wheat Genotypes Differ in Zn Efficiency when Grown in Chelate Buffered Nutrient Solution: II. Nutrient Uptake. <i>Plant Soil</i> 176[2], 317 324
OM, pH	Reuter, D. J., Loneragan, J. F., Robson, A. D., and Plaskett, D. 1982. Zinc in Subterranean Clover (<i>Trifolium subterraneum</i> L. cv. Seaton Park). I. Effects of Zinc Supply on Distribution of Zinc and Dry Weight Among Plant Parts. <i>J. Agric. Res.</i> 33, 989 999
FL	Ribeiro, N. D., dos Santos, O. S., and de Menezes, N. L. 1994. Effects of zinc and boron sources on germination and vigor of maize seed. <i>Sci. Agric.</i> 51[3], 481 485
Mix	Rico, M. I., Alvarez, J. M., and Mingot, J. I. 1996. Efficiency of Zinc Ethylenediaminetetraacetate and Zinc Lignosulfonate Soluble and Coated Fertilizers for Maize in Calcareous Soil. <i>J. Agric. Food Chem.</i> 44, 3219 3223
Mix	Rida, A. and Bouche, M. B. 1997. Heavy Metal Linkages With Mineral, Organic And Living Soil Compartments 56035. <i>Soil Biol Biochem</i> 29[3 4], 649 655
Rev	Robb, J. 1981. Early Cytological Effects of Zinc Toxicity in White Bean Leaves. <i>Ann.Bot.</i> 47, 829 834
Media	Robb, J., Busch, L., and Rauser, W. E. 1980. Zinc Toxicity and Xylem Vessel Alterations in White Beans. <i>Ann.Bot.</i> 46, 43 50
No COC	Roberts, P. A. and Thomason, I. J. 1988. Screening of a Granular Chelate of Metham Zinc for Nematicidal Activity Using Citrus and Root Knot Nematodes. <i>Ann.Appl.Nematol.</i> 2, 11 14
Mix	Robinson, B. H., Leblanc, M., Petit, D., Brooks, R. R., Kirkman, J. H., and Gregg, P. E. H. 1998. The Potential of <i>Thlaspi caerulescens</i> for Phytoremediation of Contaminated Soils. <i>Plant Soil</i> 203[1], 47 56
No COC	Robson, A. D. and Snowball, K. 1989. The Effect of 2 (4 2',4' dichlorophenoxy phenoxy) methyl propanoate on the Uptake and Utilization of Zinc by Wheat. <i>Aust.J.Agric.Res.</i> 40[5], 981 990
ERE	Root, R. A., Miller, R. J., and Koeppe, D. E. 1975. Uptake of Cadmium Its Toxicity and Effect on the Iron to Zinc Ratio in Hydroponically Grown Corn. <i>J.Environ.Qual.</i> 4[4], 473 476
Media	Rosen, J. A., Pike, C. S., and golden, M. L. 1977. Zinc, Iron, and Chlorophyll Metabolism in Zinc Toxic corn. <i>Plant Physiol.</i> 59, 1085 1087
Media	Ruano, A., Poschenrieder, C., and Barcelo, J. 1988. Growth and Biomass Partitioning in Zinc Toxic Bush Bean. <i>J.Plant Nutr.</i> 11[5], 577 588
OM, pH	Sachdev, P., Deb, D. L., and Rastogi, D. K. 1988. Effect of Varying Levels of Zinc and Manganese on Drymatter Yield and Mineral Composition of Wheat Plants at Maturity. <i>J.Nucl.Agric.Biol.</i> 17[3], 137 143

No COC	Sachdev, P. and Deb, D. L. 1990. Influence of Gypsum and Farmyard Manure on Fertilizer Zinc Uptake by Wheat and Its Residual Effect on Succeeding Rice and Wheat Crops in a Sodic Soil 56197. <i>J.Nucl.Agric.Biol.</i> 19[3], 173 178
OM, pH	Sachdev, P., Sachdev, M. S., and Deb, D. L. 1998. The Uptake and Transfer of Caesium 137, Strontium 90 and Zinc 65 from Soil to Food Crops in Tropical Environment. <i>J.Nucl.Agric.Biol.</i> 27[1], 1 9
No Conc	Sadana, U. S. and Singh, B. B. 1987b. Effect of Zinc Application of Yield and Cadmium Content of Spinach (<i>Spinacea oleracea</i> L.) Grown in a Cadmium Polluted Soil. <i>Ann.Biol.</i> 3[2], 59 60
Mix	Sadusky, Maria C. and Wentsel, Randall S. 1991. Toxicity of Brass Powder to Corn and the Relationship to Soil Fractionation of Copper and Zinc. <i>Commun.Soil Sci.Plant Anal.</i> 22[17/18], 1817 1829
ERE	Sahrawat, K. L., Mulbah, C. K., Diatta, S., DeLaune, R. D., Patrick, W. H. J., Jr., Singh, B. N., and Jones, M. P. 1996. The Role of Tolerant Genotypes and Plant Nutrients in the Management of Iron Toxicity in Lowland Rice. <i>J.Agric.Sci.</i> 126[2], 143 149
ERE	Sahu, S. K., Mitra, G. N., and Pani, S. C. 1996. Effect of Zn Application on Uptake of Nutrients by Rice on an Inceptisol. <i>J.Indian Soc.Soil Sci.</i> 44[4], 795 796
ERE	Sahu, S. K., Mitra, G. N., and Pani, S. C. 1994. Effect of Zn Sources on Uptake Zn and Other Macronutrients by Rice on Vertisol. <i>J.Indian Soc.Soil Sci.</i> 42[3], 487 489
OM, pH	Salam, M. A. and Subramanian, S. 1989. Differential Effects of Plant Characters on Grain Yield Under Two Levels of Zinc Fertilization in Rice (<i>Oryza sativa</i>). <i>Indian J.Agric.Sci.</i> 59[4], 265 266
No Dose	Salardini, A. A., Sparrow, L. A., Holloway, R. J., and Barrow, N. J Ed. 1993. Effects of Potassium and Zinc Fertilizers, Gypsum and Leaching on Cadmium in the Seed of Poppies (<i>Papaver somniferum</i> L.). <i>Developments in Plant and Soil Sciences; Plant Nutrition from Genetic Engineering to Field Practice.</i> Dev. Plant Soil Sci. 795 798
No COC	Samman, Y. and Wallace, A. 1983. Possible Plant Toxicity Resulting from High Level Applications of Zinc EDTA. <i>J. Plant Nutr.</i> 6[6], 491 500
Mix	Sanchez, A. G., Moyano, A., and Munez, C. 1999. Forms of Cadmium, Lead, and Zinc in Polluted Mining Soils and Uptake by Plants (Soria province, Spain) 58487. <i>Commun. Soil Sci. Plant Anal.</i> 30[9/10], 1385 1402
Mix	Sanders, J. R., McGrath, S. P., and Adams, T. M. 1986. Zinc, Copper and Nickel Concentrations in Ryegrass Grown on Sewage Sludge Contaminated Soils of Different pH. <i>J. Sci. Food Agric.</i> 37, 961 968
Mix	Sanglimsuwan, S., Yoshida, N., Morinaga, T., and Murooka, Y. 1993. Resistance to and Uptake of Heavy Metals in Mushrooms. <i>J. Ferment. Bioeng.</i> 75[2], 112 114
OM, pH	Sanka, M. and Dolezal, M. 1992. Prediction of Plant Contamination by Cadmium and Zinc Based on Soil Extraction Method and Contents in Seedlings. <i>Int.J.Envirn.Anal.Chem.</i> 46[1/3], 87 96
ERE	Sankhyan, N. K. and C. M. Sharma. 1997. Effect of Phosphorus and Zinc Fertilization on Grain Yield and Uptake by Maize (<i>Zea mays</i>). <i>Indian J.Agric.Sci.</i> 67[2], 63 66
ERE	Santos, B. M. and Morales Payan, J. P. 1996. Tolerance of Radish (<i>Raphanus sativus</i> L.) Cultivars Cherry Belle and White Icicle to Boron, Molybdenum, and Zinc Soil Applications. <i>Hortscience</i>

31[5], 760 (ABS)

No Control	Sarkar, A. K. and Deb, D. L. 1990. Transformation of Applied Zinc fertilizer in Rice Wheat Sequence in Inceptisol. <i>J Nucl Agric Biol</i> 19[2], 101 104
OM, pH	Sarkar, S. and Aery, N. C. 1990. Effect of Zinc on Growth of Soybean. <i>Indian J.Plant Physiol.</i> 33[3], 239 241
Mix	Sarkunan, V., Misra, A. K., and Nayar, P. K. 1989. Interaction of Zinc, Copper and Nickel in Soil on Yield and Metal Content in Rice. <i>J.Environ.Sci.Health</i> 24A[5], 459 466
Score	Sarkunan, V., Misra, A. K., and Mohapatra, A. R. 1996. Effect of Cd and Zn on Yield and Cd and Zn Content in Rice. <i>J.Indian Soc.Soil Sci.</i> 44[2], 346 348.
OM, pH	Sawan, Z. M., Gregg, B. R., and Yousef, S. E. 1999. Effect of Phosphorus, Chelated Zinc and Calcium on Cotton Seed Yield, Viability and Seedling Vigour. <i>Seed Sci.Technol.</i> 27[1], 329 337
Rev	Saxena, Y. 1993. Histopathological and Biochemical Impact of Zinc Phosphide on <i>Rattus rattus Rufescens</i> . In: V.P.Agrawal, S.A.H.Abidi, and G.P.Verma (Eds.), <i>Seminar on Environmental Impact on Aquatic & Terrestrial Habitats</i> , Dec.1991, Berhampur, India , 163 170
Mix	Schafer, J., Hannker, D., Eckhardt, J. D., and Stuben, D. 1998. Uptake of Traffic Related Heavy Metals and Platinum Group Elements (PGE) by Plants. <i>Sci.Total Environ.</i> 215[1/2], 59 67
OM, pH	Schlegel, R., Cakmak, I., Torun, B., Eker, S., and Koleli, N. 1997. The Effect of Rye Genetic Information on Zinc, Copper, Manganese and Iron Concentration of Wheat Shoots in Zinc Deficient Soil. <i>Cereal Res.Communic.</i> 25[2], 177 184
Media	Schmid, W. E., Haag, H. P., and Epstein, E. 1965. Absorption of Zinc by Excised Barley Roots. <i>Physiol.Plant.</i> 18, 860
Media	Schoettli, G. and Seiler, H. G. 1970. Uptake and Localization of Radioactive Zinc in the Visceral Complex of the Land Pulmonate <i>Arion rufus</i> . <i>Experientia (Basel)</i> 26, 1212 1213
No Dur	Schuhmacher, M., Domingo, J. L., Llobet, J. M., and Corbella, J. 1994. Cadmium, Chromium, Copper, and Zinc in Rice and Rice Field Soil from Southern Catalonia, Spain. <i>Bull.Environ.Contam.Toxicol.</i> 53[1], 54 60
No Dur	Schuhmacher, M., Domingo, J. L., Llobet, J. M., and Corbella, J. 1993. Chromium, Copper, and Zinc Concentrations in Edible Vegetables Grown in Tarragona Province, Spain. <i>Bull.Environ.Contam.Toxicol.</i> 50[4], 514 521
FL	Schwalbe, H., Heinze, M., Fiedler, H. J., and Anke, Manfred. 1996. Pot Vegetation Experiment on the Zinc Nutrition of Spruce and Beech Seedlings. <i>Mengen Spurenelem., Arbeitstag., 16th</i> , 50 56
Mix	Schwartz, C., Morel, J. L., Saumier, S., Whiting, S. N., and Baker, A. J. M. 1999. Root Development of the Zinc Hyperaccumulator Plant <i>Thlaspi caerulescens</i> as Affected by Metal Origin, Content and Localization in Soil 58493. <i>Plant Soil</i> 208[1], 103 115
FL	Sengalevich, G., Kostadinova, P., Kuzmanov, N., Alandziiski, D., Statev, S., and Tassev, H. 1991. Pollution by Heavy Metals and Pesticides of the Technogenic Region Around the D. Blagoev Nonferrous Metals Complex and the Agria THK. <i>Nauchni Tr. Vissh Selskostop.Inst. Plovdiv</i> 34[1], 37 45 (BUL)
No Conc	Sharma, U. C. and Grewal, J. S. 1990. Potato response to zinc as influenced by genetic variability.

Rev	Sharma, A. K., Srivastava, P. C., and Johri, B. N. 1994. Contribution of VA Mycorrhiza to Zinc Uptake in Plants. In: J.A.Manthey, D.E.Crowley, D.G.Luster (Eds.), Biochemistry of Metal Micronutrients in the Rhizosphere, Chapter 9, Lewis Publishers, Boca Raton, FL , 111 123
OM, pH	Sharma, A. K., Srivastava, P. C., and Johri, B. N. 1999. Multiphasic Zinc Uptake System in Mycorrhizal and Nonmycorrhizal Roots of French Bean (<i>Phaseolus vulgaris</i> L.). Curr.Sci. 76[2], 228 230
ERE	Sharma, C. M. and Bhardwaj, S. K. 1998. Effect of Phosphorus and Zinc Fertilization on Yield and Nutrient Uptake in Wheat (<i>Triticum aestivum</i>) and Their Residual Effect on Soybean (<i>Glycine max</i>). Indian J.Agron. 43[3], 426 430
OM, pH	Sharma, K. C., Krantz, B. A., Brown, A. L., and Quick, J. 1960. Interactions of Zn and P in Top and Root of Corn and Tomato. Agron.J. 60, 453 456
No Control	Sharma, K. N. and Deb, D. L. 1990. Uptake of Zinc by Wheat Plants in Soils in Relation to their Diffusion Coefficients Under Varying Physical and Chemical Environment II. Effect of Soil Bulk Density. J.Nucl.Agric.Biol. 19[1], 29 33
OM, pH	Sharma, K. N. and Deb, D. L. 1991. Uptake of Zinc by Wheat Plants in Relation to Their Diffusion Coefficients Under Varying Physical and Chemical Environment IV. Effect of Organic Manures Addition. J.Nucl.Agric.Biol. 20[2], 102 107
Media	Sharma, S. S., Schat, H., Vooijs, R., and Van Heerwaarden, L. M. 1999. Combination Toxicology of Copper, Zinc, and Cadmium in Binary Mixtures: Concentration Dependent Antagonistic, Nonadditive, and Synergistic Effects on Root Growth in <i>Silene vulgaris</i> . Environ.Toxicol.Chem. 18[2], 348 355
Media	Shaw, J. 1988. Genetic Variation for Tolerance to Copper and Zinc Within and Among Populations of the Moss, <i>Funaria hygrometrica</i> Hedw. New Phytol. 109, 211 222
Media	Shen, Zhenguo, Zhang, Fenqin, and Zhang, Fusuo. 1998. Toxicity of copper and zinc in seedlings of mung bean and inducing accumulation of polyamine. J.Plant Nutr. 21[6], 1153 1162
No Control	Sheppard, S. C., Evenden, W. G., and Cornwell, T. C. 1997. Depuration and Uptake Kinetics of I, Cs, Mn, Zn and Cd By The Earthworm (<i>Lumbricus terrestris</i>) In Radiotracer Spiked Litter. Environ.Toxicol.Chem. 16[10], 2106 2112
Mix	Shetty, K. G., Hetrick, B. A. D., Figge, D. A. H., and Schwab, A. P. 1994. Effects of mycorrhizae and other soil microbes on revegetation of heavy metal contaminated mine spoil 56544. Environ.Pollut. 86[2], 181 188
Ecol	Shetty, K. G., Hetrick, B. A. D., and Schwab, A. P. 1995. Effects of Mycorrhizae Fertilizer Amendments on Zinc Tolerance of Plants. Environ. Pollut. 88[3], 307 314
Nut def	Shukla, U. C. and Raj, H. 1976. Zinc Response in Corn as Influenced by Genetic Variability. Agron.J. 68, 20 22
No Control	Shukla, S. and Yadav, D. S. 1998. Phosphorus and Zinc Management in Rice (<i>Oryza sativa</i>) Wheat (<i>Triticum aestivum</i>) Cropping System in Eastern Uttar Pradesh. Indian J.Agron. 43[3], 371 375
No Control	Shuman, L. M. and Wang, J. 1997. Effect of rice variety on zinc, cadmium, iron, and manganese content in rhizosphere and non rhizosphere soil fractions 56593. Commun.Soil Sci.Plant Anal.

28[1/2], 23 36

Mix	Shuman, Larry M. and Li, Zhenbin. 1997. Amelioration of Zinc Toxicity in Cotton Using Lime or Mushroom Compost. <i>J.Soil Contam.</i> 6[4], 425 438
In Vit	Siegel, S. M. 1977. The Cytotoxic Response of Nicotiana Protoplast to Metal Ions: A Survey of the Chemical Elements. <i>Water Air Soil Pollut.</i> 8[1 4], 293 304
Species	Simkiss, K. and Watkins, B. 1991. Differences in Zinc Uptake Between Snails (<i>Helix aspera</i> (Muller)) From Metal and Bacteria Polluted Sites. <i>Functional Ecol</i> 5, 787 794
Media	Simon, E. 1977. Cadmium Tolerance in Populations of <i>Agrostis tenuis</i> and <i>Festuca ovina</i> . <i>Nature</i> 265, 328 330
Mix	Sims, J. T. 1986. Soil pH Effects on the Distribution and Plant Availability of Manganese, Copper, and Zinc. <i>Soil Sci.Soc.Am.J.</i> 50, 367 373
ERE	Singh, R., Sharma, P. R., Singh, M., and Sharma, R. 1997. Phosphorus, Sulphur and Zinc Interactions in Barley (<i>Hordeum vulgare</i> L.). Concentration and Uptake of Sulphur and Zinc. <i>Crop Res.</i> 14[1], 45 54.
Score	Singh, B. and Antil, R. A. 1996. Effect of Zn and N levels on Dry Matter Yield and Nutrient Uptake by Wheat. <i>Ann.Biol.(Ludhiana)</i> 12[1], 165 167.
No Effect	Singh, K., Ghosal, S., and Singh, J. 1992b. Effect of Sulphur, Zinc and Iron on Chlorophyll Content, Yield, Protein Harvest and Nutrient Uptake of French Bean (<i>Phaseolus vulgaris</i> L.). <i>J.Plant Nutr.</i> 15[10], 2025 2033
No Effect	Singh, S. P. and Nayyar, V. K. 1989. Effect of cadmium and zinc on growth of corn in a coarse texture soil (Typic Ustipsammments). <i>Int.J.Environ.Stud.</i> 34[1 2], 57 63.
Nut def	Singh, M., Singh, N., and Tewatia, R. K. 1992a. Potassium and zinc interactions in pearl millet and corn grown in sandy Soils. <i>Crop Res (Hisar)</i> 5[1], 43 49
No Conc	Singh, B. P., Das, M., Prasad, R. N., and Ram, M. 1992c. Characteristics of Fe Toxic Soils and Affected Plants and Their Correction in Acid Haplaquents of Meghalaya. <i>Int. Rice Res. Newsl.</i> 17[2], 18 19
No Conc	Singh, B., Chhipa, B. R., and Lal, P. 1992d. A Study on Sodcity of Waters and Zinc Interactions in Relation to Soil Properties, Growth and Yield of Wheat Grown on Loamy Sand Soil. <i>Agrochimica</i> 36[1/2], 1 9
No Control	Singh, A. K., Thakur, S., and Singh, S. K. 1995. Response of rice to nitrogen and zinc application in a calcareous situation. <i>International Rice Research Notes</i> 20[2], 16 17
No Dose	Singh, A. L., Joshi, Y. C., Chaudhari, V., and Zala, P. V. 1990. Effect of Different Sources of Iron and Sulfur on Leaf Chlorosis, Nutrient Uptake and Yield of Groundnut. <i>Fert.Res.</i> 24[2], 85 96
OM, pH	Singh, B. R. and Steenberg, K. 1974. Plant Response to Micronutrients I. Uptake, Distribution and Translocation of Zinc in Maize and Barley Plants. <i>Plant Soil</i> 40, 637 646
OM, pH	Singh, B. R. and Steenberg, K. 1974. Plant Response to Micronutrients III. Interaction Between Manganese and Zinc in Maize Barley Plants. <i>Plant Soil</i> 40, 655 667
OM, pH	Singh, B. R. and Steinnes, E. 1976. Uptake of Trace Elements by Barley in Zinc Polluted Soils: 2.

	Lead, Cadmium, Mercury, Selenium, Arsenic, Chromium and Vanadium in Barley. <i>Soil Sci.</i> 121[1], 38 43
Species	Singh, H. and Dhooria, M. S. 1971. Comparative Efficacy of Some Insecticides Against <i>Etiella zinckenella</i> Infesting Lentil Pods. <i>Indian J.Agric.Sci.</i> 41[12], 1102 1106
OM, pH	Singh, N., Mehta, S. C., and Singh, B. 1988. Varietal Response of Wheat to Zinc. <i>Haryana J.Agron.</i> 4[2], 133 134
ERE	Singh, R., Sharma, P. R., Singh, M., Sharma, R., and Laura, R. D. 1997. Phosphorus, Sulphur and Zinc Interactions in Barley (<i>Hordium vulgare</i> L.) Yield, Phosphorus Concentration and Its Uptake. <i>Crop Res.(Hisar)</i> 13[3], 571 577
Mix	Singh, R. S., Singh, R. P., Rai, R. K., and Agrawal, H. P. 1994. Relationship Between Soil Test Methods and Uptake of Copper and Zinc by Grasses on Polluted Soils 56671. <i>Commun.Soil Sci.Plant Anal.</i> 25[9/10], 1313 1320
No Control	Singh, S. P. and Nayyar, V. K. 1995. Critical Limit of Zinc for Cotton on a Typic Ustochrept. <i>J.Indian Soc.Soil Sci.</i> 43[3], 479 481
ERE	Singh, V., Kumar, V., and Karwasra, S. P. S. 1995. Interaction of S and Zn on Dry Matter Yield, Concentration and Uptake of S in Green Gram (<i>Vigna radiata</i> L.). <i>Crop Res.</i> 9[1], 32 41
Mix	Sjogren, M., Augustsson, A., and Rundgren, S. 1995. Dispersal and Fragmentation of the Enchytraeid <i>Cognettia Sphagnetorum</i> in Metal Polluted Soil. <i>Pedobiologia</i> 39[3], 207 218
OM, pH	Sjogren, M. 1992. From Heavy Metals Affect Soil Fauna To Choosing Variables And Organisms For A Test System. Anderson, J.P.E., et al.(Eds.), <i>Proc.Int.Symp.on Environmental Aspects of Pesticide Microbiology</i> , Aug.17 21, 1992, Sigtuna, Sweden, Dep.of Microbiol., Swedish Univ.of Agric.Sci. 242 247
Media	Slade, S. J. 1993. The Effect of Silver and Other Metal Ions on the In Vivo Growth of Root Rotting <i>Phytophthora</i> and Other Fungal Species. <i>Ann.Appl.Biol.</i> 122[2], 233 251
No COC	Smiley, R. W. and Craven, M. M. 1978. Fungicides in Kentucky Bluegrass Turf: Effects on Thatch and pH. <i>Agron.J.</i> 70, 1013 1019
OM, pH	Smit, C. E., Van Beelen, P., and Van Gestel, C. A. M. 1997. Development of Zinc Bioavailability and Toxicity for the Springtail <i>Folsomia candida</i> in an Experimentally Contaminated Field Plot. <i>Environ.Pollut.</i> 98[1], 73 80
OM, pH	Smit, C. E. and Van Gestel, C. A. M. 1995. Influence of Temperature and Humidity Fluctuations on the Sensitivity of <i>Folsomia candida</i> for Zinc 56732. In: W.J.Van den Brink, R.Bosman, and F.Arendt (Eds.), <i>Contaminated Soil '95</i> , Kluwer, Dordrecht, Netherlands , 645 646
Species	Smith, C. J., Hopmans, P., and Cook, F. J. 1996. Accumulation of Cr, Pb, Cu, Ni, Zn and Cd in Soil Following Irrigation with Treated Urban Effluent in Australia. <i>Environ.Pollut.</i> 94[3], 317 323
No Control	Smith, P. F. 1956. Effects of High Levels of Copper, Zinc and Manganese on Tree Growth and Fruiting of Valencia Orange in Sand Culture. <i>Proc.Am.Soc.Hortic.Sci.</i> 67, 202 209
Media	Smith, P. F. and Specht, A. W. 1953. Heavy Metal Nutrition and Iron Chlorosis of Citrus Seedlings. <i>Plant Physiol.</i> 28, 371 382
Media	Smith, P. F. and Specht, A. W. 1953. Mineral Composition of Valencia Orange Seedlings Grown in

	Solution with Varying Amounts of Copper, Zinc, Manganese, and Iron. <i>Proc.Fla.State Hortic.Soc.</i> 66, 85 89
No Dose	Smith, R. L. and Shoukry, K. S. M. 1968. Changes in the Zinc Distribution Within Three Soils and Zinc Uptake by Field Beans Caused by Decomposing Organic Matter. In: <i>Isotopes and Radiation in Soil Organic Matter Studies</i> , IAEA, Vienna, Australia , 397 410
OM, pH	Smith, W. H. and Pooley, A. S. 1989. Red Spruce Rhizosphere Dynamics: Spatial Distribution of Aluminum and Zinc in the Near Root Soil Zone. <i>For.Sci.</i> 35[4], 1114 1124
OM, pH	Snyder, E. and Harmon, F. N. 1954. Some Responses of Vinifera Grapes to Zinc Sulphate. <i>Proc.Am.Soc.Hortic.Sci.</i> 63, 91 94
No COC	Soliman, M. F., Kostandi, S. F., and Van Beusichem, M. L. 1992. Influence of Sulfur and Nitrogen Fertilizer on the Uptake of Iron, Manganese and Zinc by Corn Plants Grown in Calcareous Soil. <i>Commun.Soil Sci.Plant Anal.</i> 23[11/12], 1289 1300
ERE	Spear, G. T. and Christians, N. E. 1991. Creeping Bentgrass Response to Zinc in Modified Soil. <i>Commun.Soil Sci.Plant Anal.</i> 2[19/20], 2005 2016
OM, pH	Spurgeon, D. J. and Hopkin, S. P. 1999. Tolerance to Zinc in Populations of the Earthworm <i>Lumbricus rubellus</i> from Uncontaminated and Metal Contaminated Ecosystems. <i>Arch.Environ.Contam.Toxicol.</i> 37[3], 332 337
ERE	Srivastava, P. C., Gangwar, M. S., and Singh, V. P. 1999. Adsorption Desorption of Zinc in Mollisols and Their Relationship with Uptake of Fertilizer Applied Zinc by Rice. <i>Commun.Soil Sci.Plant Anal.</i> 30[3/4], 471 481
No Control	Staker, E. V. 1942. Progress Report on the Control of Zinc Toxicity in Peat Soils. <i>Soil Sci.Soc.Am.Proc.</i> 7, 387 392
ERE	Staker, E. V. and Cummings, R. W. 1941. The Influence of Zinc on the Productivity of Certain New York Peat Soils. <i>Soil Sci.Soc.Am.Proc.</i> 6, 207 214
Mix	Stefanov, K., Seizova, K., Yanishlieva, N., Marinova, E., and Popov, S. 1995. Accumulation of Lead, Zinc and Cadmium in Plant Seeds Growing in Metalliferous Habitats in Bulgaria. <i>Food Chemistry</i> 54[3], 311 313
Media	Steinberg, R. A. 1918. A Study of Some Factors Influencing the Stimulative Action of Zinc Sulphate on the Growth of <i>Aspergillus niger</i> . I. The Effect of the Presence of Zinc in the Cultural Flasks. <i>Mem.Torrey Bot.Club</i> 17, 287 293
Media	Steinberg, R. A. 1936. Effects of Barium Salts upon <i>Aspergillus niger</i> and Their Bearing upon the Sulphur and Zinc Metabolism of the Fungus in an Optimum Solution. <i>Bot.Gaz.</i> 97, 666 671
FL	Stepanok, V. V. and Golenetskii, S. P. 1990. Effect of zinc compounds on crop yield and on zinc accumulation by plants. <i>Agrokhimiya</i> [3], 85 91
Mix	Strojan, C. L. 1978. The Impact of Zinc Smelter Emissions on Forest Litter Arthropods. <i>Oikos</i> 31[1], 41 46
Not Avail	Strojan, Carl L. 1975. The Ecological Impact of Zinc Smelter Pollution on Forest Soil Communities. Ph.D.Thesis, Rutgers University, The States University of New Jersey (UMI# 7517476) , 108

Mix	Subrahmanyam, K., Nair, A. K., and Singh, D. V. 1991. Evaluation of diammonium and polyphosphates as carriers of iron and zinc in japanese mint ratoon mungbean cropping sequence. J. Indian Soc. Soil Sci. 39[3], 477 481
OM, pH	Sudia, T. W. and Green, D. G. 1972. The Translocation of Zn65 and Cs134 Between Seed Generations in Soybean (Glycine max (L.) Merr.). Plant Soil 37, 695 697
Media	Swiader, J. M. 1985. Iron and Zinc Absorption Characteristics and Copper Inhibitions in Cucurbitaceae. J.Plant Nutr. 8[10], 921 931
No Conc	Swietlik, D. and Laduke, J. V. 1991. Productivity, Growth and Leaf Mineral Composition of Orange and Grapefruit Trees Foliar sprayed with Zinc and Manganese. J. Plant Nutr. 14[2], 129 142
No Dur	Takijima, Y., Katsumi, F., and Tabezawa, K. 1973. Cadmium Contamination of Soils and Rice Plants Caused by Zinc Mining. II. Soil Conditions of Contaminted Paddy Fields which Influence Heavy Metal Contents in Rice. Soil Sci.Plant Nutr. 19, 173 182
Mix	Takijima, Y. and Katsumi, F. 1973. Cadmium Contamination of Soils and Rice Plants Cuased by Zinc Mining. IV. Use of Soil Amendment Materials for the Control of Cd Uptake of Plants. Soil Sci.Plant Nutr. 19[4], 235 244
ERE	Takijima, Y., Katsumi, F., and Koizumi, S. 1973. Cadmium Contamination of Soils and Rice Plants Caused by Zinc Mining. III. Effects of Water Management and Applied Organic Manures on the Control of Cd Uptake by Plants. Soil Sci.Plant Nutr. 19[3], 183 193
OM, pH	Takkar, P. N. and Mann, M. S. 1978. Toxic Levels of Soil and Plant Zinc for Maize and Wheat. Plant Soil 49, 667 669
Species	Talukdar, F. A., Jahan, M. S., and Ahmed, S. 1991. Effect of nitrogen and zinc on rice green leafhoppers Nephrotettix spp and prey predator relationship between leafhoppers and their predators. Pak J Sci Ind Res 34[11], 453 455
FL	Tasev, Hr, Georgieva, V., and Sengalevich, G. 1997. Effect of single and combined soil pollution with lead, zinc and cadmium on the productivity and their content in some cultivated plants. II. Zinc. Pochvozn., Agrokhim.Ekol., V32, N1, P20 28
FL	Tasev, Hr, Georgieva, V., and Sengalevich, G. 1997. Effect of single and combined soil pollution with lead, zinc and cadmium on the productivity and their content in some cultivated plants. I. Lead. Pochvozn., Agrokhim.Ekol., V32, N1, P3 11
Media	Temesagdie, Panie and Takano, Taikichi. 1992. Effects of treated seeds with boric acid, GA3, potassium nitrate and zinc sulfate on seedling growth of sweet corn and yard long bean. Kasetsart J.: Nat.Sci. 26[5], 34 40
OM, pH	Terman, G. L., Giordano, P. M., and Christensen, N. W. 1975. Corn Hybrid Yield Effects on Phosphorus, Manganese and Zinc Absorption. Agron. J. 67, 182 185
OM, pH	Thompson, A. H. and Batjer, L. P. 1950. Effect of Various Soil Treatments for Correcting Arsenic Injury of Peach Trees. Soil Sci. 69, 281 290
No Tox	Thompson, J. P. 1996. Correction of Dual Phosphorus and Zinc Deficiencies of Linseed (Linum usitatissimum L.) with Cultures of Vesicular Arbuscular Mycorrhizal Fungi. Soil Biol.Biochem. 28[7], 941 951

Media	Tiffin, L. O. 1967. Translation of Manganese, Iron, Cobalt and Zinc in Tomato. <i>Plant Physiol.</i> 42, 1427 1432
No Dose	Tiller, K. G., Honeysett, J. L., and De Vries, M. P. C. 1972. Soil Zinc and Its Uptake by Plants. II. Soil Chemistry in Relation to Prediction of Availability. <i>Aust.J.Soil Res.</i> 10, 165 182
Mix	Tlustos, P., Balik, J., Pavlikova, D., and Szakova, J. 1997. The uptake of cadmium, zinc, arsenic and lead by chosen crops. <i>Rostl.Vyroba</i> 43[10], 487 494
Mix	Tolle, D. A., Arthur, M. F., Chesson, J., and Van Voris, P. 1985. Comparison of Pots Versus Microcosms for Predicting Agroecosystem Effects due to Waste Amendment. <i>Environ.Toxicol.Chem.</i> 4[4], 501 509
OM, pH	Tomar, N. K. and Sharma, A. K. 1997. Effect of Preincubated Phosphates and Pyrite with Manure on the Availability of Zinc to Wheat on Sodic Soil. <i>Crop Res.(Hisar)</i> 13[3], 583 588
No COC	Totawat, K. L. and Chauhan, S. C. 1992. Effect of soil treatments and plant cultivars on crop production in zinc polluted fields. <i>Int.J.Trop.Agric.</i> 10[3], 180 185
ERE	Triebskorn, R. and Kohler, H. R. 1996. The Impact of Heavy Metals on the Grey Garden Slug, <i>Deroceras reticulatum</i> (Muller): Metal Storage, Cellular Effects and Semi quantitative Evaluation of Metal Toxicity. <i>Environ.Pollut.</i> 93[3], 327 343
No COC	Tsakelidou, K., Karagiannidis, N., and Bladenopoulou, S. 1999. Effects of calcium carbonate and organic matter on soil aluminum, manganese, iron, zinc and copper and their concentration in corn plants in greek acid soils. <i>Agrochimica</i> 43[2], 89 100
Media	Tso, T. C., Sorokin, T. P., and Engelhaupt, M. E. 1973. Effects of Some Rare Elements on Nicotine Content of the Tobacco Plant. <i>Plant Physiol.</i> 51, 805 806
Mix	Turnau, K. 1998. Heavy Metal Content and Localization in Mycorrhizal <i>Euphorbia cyparissias</i> from Zinc Wastes in Southern Poland 58533. <i>Acta Soc.Bot.Pol./Pol.J.Bot.</i> 67[1], 105 113
No Dur	Turnau, K. 1989. The Influence of Industrial Dusts on the Mycorrhizal Status of Plants in Pino Quercetum Forest. <i>Agric.Ecosyst.Environ.</i> 28, 529 533
Media	Turner, M. A. 1973. Effect of Cadmium Treatment on Cadmium and Zinc Uptake by Selected Vegetable Species. <i>J.Environ.Qual.</i> 2[1], 118 119
Media	Turner, R. G. and Marshall, C. 1971. The Accumulation of ⁶⁵ Zn by Root Homogenates of Zinc Tolerant and Non Tolerant Clones of <i>Agrostis tenuis</i> Sibth. <i>New Phytol.</i> 70, 539 545
Media	Turner, R. G. and Marshall, C. 1972. The Accumulation of Zinc by Subcellular Fractions of Roots of <i>Agrostis tenuis</i> Sibth. in Relation to Zinc Tolerance. <i>New Phytol.</i> 71, 671 676
Media	Turner, R. G. and Gregory, R. P. G. 1967. The Use of Radioisotopes to Investigate Heavy Metal Tolerance in Plants. In: <i>Isotopes in Plant Nutrition and Physiology</i> , Austria: I.A.E.A. 493 508
OM, pH	Udaiyan, K., Greep, S., Muthukumar, T., and Chitra, A. 1999. Effect of Fumigation and Pesticide Drenches on VAM Status and Growth in Cereals. <i>J.Environ.Biol.</i> 20[2], 167 175
Media	Utriainen, M. A., Karenlampi, L. V., Karenlampi, S. O., and Schat, H. 1997. Differential Tolerance to Copper and Zinc of Micropropagated Birches Tested in Hydroponics. <i>New Phytol.</i> 137, 543 549
Mix	Valdares, J. M. A. S., Gal, M., Mingelgrin, U., and Page, A. L. 1983. Some Heavy Metals in Soils

	Treated with Sewage Sludge, Their Effects on Yield, and Their Uptake by Plants. <i>J.Environ.Qual.</i> 12[1], 49 57
Media	Van Assche, F. and Clijsters, H. 1988. Induction of Enzyme Capacity in Plants as a Result of Heavy Metal Toxicity: Dose Response Relation in <i>Phaseolus vulgaris</i> L. Treated with Zinc and Cadmium. <i>Environ.Pollut.</i> 52[2], 103 115
Media	Van Beelen, P. and Fleurren Kemila, A. K. 1999. A Comparison Between Toxicity Tests Using Single Species and a Microbial Process. <i>Chemosphere</i> 38[14], 3277 3290
Media	Van Capelleveen, E. H. E. 1985. The Ecotoxicity of Zinc and Cadmium for Terrestrial Isopods. In: T.D.Lekkas (Ed.), <i>Heavy Metals in the Environment</i> , CEP Consultants Ltd., Edinburgh, U.K. 245 247
Mix	an Hook, R. I. 1974. Cadmium, Lead, and Zinc Distribution Between Earthworms and Soils: Potentials for Biological Accumulation. <i>Bull Environ Contam Toxicol</i> 12[4], 509 512
OM, pH	Van Rhee, J. A. 1975. Copper Contamination Effects on Earthworms by Disposal of Pig Waste in Pastures. <i>Prog Soil Zool</i> 1975, 451 457
Mix	Van, Der Watt, Sumner, M. E., and Cabrera, M. L. 1994. Bioavailability of Copper, Manganese, and Zinc in Poultry Litter. <i>J.Environ.Qual.</i> 43 49
ERE	Vanden Heuvel, R. M., Sawyer, J. E., Schmitt, M. A., Hoeft, R. G., and Brinkman, G. S. 1989. Corn Response to Zinc on Illinois Soils. <i>J.Fert.Issues</i> 6[3], 68 76
OM, pH	Vangronsveld, J., Van, Assche F., and Clijsters, H. 1995. Reclamation of a Bare Industrial Area Contaminated by Non ferrous Metals: In Situ Metal Immobilization and Revegetation. <i>Environ.Pollut.</i> 87[1], 51 59
No Dose	Varavipour, M., Hasan, R., and Singh, D. 1999. Effect of Applied Phosphorus, Sulphur and Zinc on Yield and Uptake Parameters of Wheat (<i>Triticum aestivum</i>) and Soybean (<i>Glycine max</i>) Grown on a Loamy Sand. <i>Indian J.Agric.Sci.</i> 69[1], 1 4
OM, pH	Veavington, F. 1975. Heavy Metal Contamination of Vegetables and Soil in Domestic Gardens Around a Smelting Complex. <i>Environ.Pollut.</i> 9[3], 211 217
Media	Veer, B. 1989. Effects of Nickel and Zinc on Seedling Growth and Hydrolytic Enzymes in <i>Phaseolus aureus</i> cv. R 851. <i>Geobios (Jodhpur)</i> 16[6], 245 248
OM, pH	Veijalainen, H. 1998. The Applicability of Peat and Needle Analysis in Heavy Metal Deposition Surveys. <i>Water Air Soil Pollut.</i> 107[1 4], 367 391
Media	Veltrup, W. 1978. Characteristics of Zinc Uptake by Barley Roots. <i>Physiol.Plant.</i> 42, 190 194
Media	Venkateswerlu, G. and Sastry, K. S. 1973. Interrelationships in Trace Element Metabolism in Metal Toxicities in a Cobalt Resistant Strain of <i>Neurospora crassa</i> . <i>Biochem.J.</i> 132[4], 673 680
OM, pH	Vesper, S. J. and Weidensaul, T. C. 1978. Effects of Cadmium, Nickel, Copper and Zinc on Nitrogen Fixation by Soybeans. <i>Water Air Soil Pollut.</i> 9, 413 422
OM, pH	Viets, F. G. J., Boawn, L. C., and Crawford, C. L. 1957. The Effect of Nitrogen and Types of Nitrogen Carrier on Plant Uptake of Indigenous and Applied Zinc. <i>Soil Sci.Soc.Am.Proc.</i> 21, 197 201

Mix	Vlamiš, J., Williams, D. E., Corey, J. E., Page, A. L., and Ganje, T. J. 1985. Zinc and Cadmium Uptake by Barley in Field Plots Fertilized Seven Years with Urban and Suburban Sludge. <i>Soil Sci.</i> 139[1], 81 87
Media	Volschenk, C. G., Hunter, J. J., and Watts, J. E. 1996. The effect of different zinc levels on the growth of grapevines. <i>J.Plant Nutr.</i> 19[6], 827 837
Media	Von Rosen, G. 1964. Mutations Induced by the Action of Metal Ions in <i>Pisum</i> . II. Further Investigations on the Mutagenic Action of Metal Ions and Comparison with the Activity of Ionizing Radiation. <i>Hereditas</i> 51, 89 134
Media	Wainwright, S. J. and Beckett, P. J. 1975. Kinetic Studies on the Binding of Zinc by the Lichen <i>Usnea florida</i> (L.) Web. <i>New Phytol.</i> 75[1], 91 98
Media	Wainwright, S. J. and Woolhouse, H. W. 1977. Some Physiological Aspects of Copper and Zinc Tolerance in <i>Agrostis tenuis</i> Sibth: Cell Elongation and Membrane Damage. <i>J.Exp.Bot.</i> 28[105], 1029 1036
ERE	Walker, W. M., Miller, J. E., and Hassett, J. J. 1977. Effect of Lead and Cadmium upon the Boron, Copper, Manganese, and Zinc Concentration of Young Corn Plants. <i>Comm.Soil Sci.Plant Anal.</i> 8[1], 57 66
Media	Wallace, A. 1982. Additive, Protective and Synergistic Effects of Plants with Excess Trace Elements. <i>Soil Sci.</i> 133[5], 319 323
Media	Wallace, A. and Berry, W. L. 1989. Dose Response Curves for Zinc, Cadmium, and Nickel in Combinations of One, Two, or Three. <i>Soil Sci.</i> 147[6], 401 410
No Dose	Wallace, A., Mueller, R. T., and Alexander, C. V. 1976. High Levels of Four Heavy Metals on the Iron Status of Plants. <i>Comm.Soil Sci.Plant Anal.</i> 7[1], 43 46
OM, pH	Wallace, A., Alexander, G. V., and Chaudgry, F. M. 1977. Phytotoxicity and Some Interactions of the Essential Trace Metals Iron, Manganese, Molybdenum, Zinc, Copper, and Boron. <i>Commun.Soil Sci.Plant Anal.</i> 8[9], 741 750
Media	Wallace, Arthur and Abou Zamzam, A. M. 1989. Calcium Zinc Interactions and Growth of Bush Beans in Solution Culture. <i>Soil Sci.</i> 147[6], 442 443
OM, pH	Walley, K. A., Khan, M. S. I., and Bradshaw, A. D. 1974. The Potential for Evolution of Heavy Metal Tolerance in Plants. I. Copper and Zinc Tolerance in <i>Agrostis tenuis</i> . <i>Heredity</i> 32[3], 309 319
No Conc	.Walsh, L. M., Steevens, D. R., Seibel, H. D., and Weis, G. G. 1972. Effect of High Rates of Zinc on Several Crops on an Irrigated Plainfield Sand. <i>Commun.Soil Sci.Plant Anal.</i> 3[3], 187 195.
OM; pH	Wang, Haixiao, Wu, Junlan, Zhang, Tiejin, Wu, Qixiang, Chen, Yang, Bian, Junsheng, and Shan, Fang. 1990. Interaction Between Phosphorus and Zinc and Their Influence on Growth of Corn Seedlings on Calcareous Soil. <i>Turang Xuebao</i> 27[3], 241 249
Media	Wang, W. 1994. Rice Seed Toxicity Tests for Organic and Inorganic Substances. <i>Environ.Monit.Assess.</i> 29, 101 107
Media	Wang, W. 1987. Root Elongation Method for Toxicity Testing of Organic and Inorganic Pollutants. <i>Environ.Toxicol.Chem.</i> 6[5], 409 414
FL	Wang, Y. P. and Chao, C. C. 1992. Effects of Vesicular Arbuscular Mycorrhizae and Heavy Metals

on the Growth of Soybean and Phosphate and Heavy Metal Uptake by Soybean in Major Soil Groups of Taiwan. *J.Agric.Assoc.China New Ser.* [157], 6 20 (CHI) (ENG ABS)

Mix	Wang, Z., Zhang, Y., Hu, J., Zheng, Y., Hu, Z., Guo, Y., Lai, Q., Yan, H., and Deng, J. 1994. Effect of Heavy Metals in Soil on Earthworms (<i>Opisthopora</i>). <i>Huanjing Kexue Xuebao</i> 14[2], 236 243
No Dur	Watmough, S. A. and Dickinson, N. M. 1995. Dispersal and Mobility of Heavy Metals in Relation to Tree Survival in an Aerially Contaminated Woodland Soil. <i>Environ.Pollut.</i> 90[2], 135 142
OM, pH	Wear, J. I. 1956. Effect of Soil pH and Calcium on Uptake of Zinc by Plants. <i>Soil Sci.</i> 81, 311 315
Media	Webb, Michael J. and Loneragan, Jack F. 1988. Effect of zinc deficiency on growth, phosphorus concentration, and phosphorus toxicity of wheat plants. <i>Soil Sci.Soc.Am.J.</i> , V52, N6, P1676 80 52[6], 1676 1680
No Dur	Webber, J. 1972. Effects of Toxic Metals in Sewage on Crops. <i>Water Pollut.Control</i> 71, 404 413
Media	Welch, R. M., Hart, J. J., Norvell, W. A., Sullivan, L. A., and Kochian, L. V. 1999. Effects of Nutrient Solution Zinc Activity on Net Uptake, Translocation and Root Export of Cadmium and Zinc by Separated Sections of Intact Durum Wheat (<i>Triticum turgidum</i> L. var durum) Seedling Roots. <i>Plant Soil</i> 208[2], 243 250
No Dose	Wellings, N. P., Wearing, A. H., and Thompson, J. P. Vesicular arbuscular mycorrhizae can improve phosphorus and zinc nutrition and growth of pigeonpea in a vertisol. <i>Aust.J.Agric.Res.</i> 42[5], 835 846
Rev	Weltje, L. 1998. Mixture Toxicity and Tissue Interactions of Cd, Cu, Pb and Zn in Earthworms (<i>Oligochaeta</i>) in Laboratory and Field Soils: A Critical Evaluation of Data. <i>Chemosphere</i> 36[12], 2643 2660
Media	Wettlaufer, S. H., Osmeloski, J., and Weinstein, L. H. 1991. Response of Polyamines to Heavy Metal Stress in Oat Seedlings. <i>Environ.Toxicol.Chem.</i> 10[8], 1083 1088
Media	Wheal, M. and Rengel, Z. 1997. Chlorsulfuron Reduces Rates of Zinc Uptake by Wheat Seedlings from Solution Culture. <i>Plant Soil</i> 188[2], 309 317
No COC	Wheal, M. S., Rengel, Z., and Graham, R. D. 1998. Chlorsulfuron Reduces Extension of Wheat Root Tips in Low Zinc Solution Culture. <i>Ann.Bot.</i> 81[3], 385 389
Publ As	Wheeler, D. M., Power, I. L., and Edmeades, D. C. 1993. Effect of Various Metal Ions on Growth of Two Wheat Lines Known to Differ in Aluminium Tolerance. In: Barrow, N.J.(Ed.), <i>Developments in Plant and Soil Sciences, Plant Nutrition from Genetic Engineering to Field Practice</i> , 723 726
Media	Wheeler, D. M., Power, I. L., and Edmeades, D. C. 1993. Effect of Various Metal Ions on Growth of Two Wheat Lines Known to Differ in Aluminum Tolerance. <i>Plant Soil</i> 155/156, 489 492
OM, pH	White, M. C., Chaney, R. L., and Decker, A. M. 1979. Differential Cultivar Tolerance in Soybean to Phytotoxic Levels of Soil Zn. II. Range of Zn Additions and the Uptake and Translocation of Zn, Mn, Fe and P. <i>Agronomy</i> 71, 126 131
No Dur	White, M. C., Chaney, R. L., and Decker, A. M. 1974. Differential Varietal Tolerance in Soybean to Toxic Levels of Zinc in Sassafras Sandy Loam. <i>Agron.Abstr.</i> 1974, 144 145

Not Avail	White, M. C. 1976. Differential Varietal Tolerance in Soybean (<i>Glycine max</i> L.) to Phytotoxic Levels of Zinc in a Sassafras Sandy Loam. M.S.Thesis, Univ Maryland, College Park, MD , 196
Mix	White, M. C. and Chaney, R. L. 1980. Zinc, Cadmium and Manganese Uptake by Soybean from Two Zinc and Cadmium Amended Coastal Plain Soils. <i>Soil Sci.Am.J.</i> 44, 308 313
Score	White, M. C., Chaney, R. L., and Decker, A. M. 1979a. Role of Roots and Shoots of Soybean in Tolerance to Excess Soil Zinc. <i>Crop Sci.</i> 19, 126 128
FL	Wieler, A. 1938. The Action of Lead and Zinc Compounds on the Growth and Development of Plant Cultures (Ueber die Einwirkung von Blei und Zinkverbindungen auf Wachstum und Entwicklung von Kulturpflanzen). <i>Mitt.Forstwirtschaft.Forstwiss.</i> 9, 175 191 (GER)
Mix	Wilke, B. M. 1991. Effects of Single and Successive Additions of Cadmium, Nickel and Zinc on Carbon Dioxide Evolution and Dehydrogenase Activity in a Sandy Luvisol 57987. <i>Biol.Fertil.Soils</i> 11[1], 34 37
Mix	Wilkins, C. 1997. The Uptake of Copper, Arsenic and Zinc by <i>Miscanthus</i> Environmental Implications for Use as an Energy Crop. <i>Biomass and Energy Crops</i> , April 7 8, 1997, Royal Agricultural College, Cirencester , 335 340
Species	William, M. 1985. Analysis of the Effects of Zinc Pollution on the Macroinvertebrate Populations of the Afon Crafnant North Wales UK. <i>Environ.Geochem.Health</i> 7[3], 98 109
No Dose	Williams, C. H. and David, D. J. 1976. The Accumulation in Soil of Cadmium Residues from Phosphate Fertilizers and Their Effect on the Cadmium Content of Plants. <i>Soil Sci.</i> 121, 861 893
Rev	Williams, J. H. 1977. Effect of Soil pH on the Toxicity of Zinc and Nickel to Vegetable Crops. In: Ref.Book No.326, <i>Inorganic Pollution and Agriculture</i> , Ministry of Agriculture, Fisheries and Food (MAFF), Lowestoft, Suffolk, UK , 211 221
Mix	Williamson, P. 1980. Variables Affecting Body Burden of Lead, Zinc, and Cadmium in a Roadside Population of the Snail, <i>Cepaea hortensis</i> Muller. <i>Oecologia</i> 44, 213 220
Species	Willoughby, R. A. and Thawley, D. G. 1975. Lead, Cadmium, Zinc, Calcium and Vitamin D Interactions in Animals. In: <i>Proc.Int.Conf.on Heavy Metals in the Environment</i> , Oct.27 31, 1975, Toronto, Canada , 143 154
Media	Willuhn, J., Schmitt Wrede, H. P., Otto, A., and Wunderlich, F. 1996. Cadmium Detoxification in the Earthworm <i>Enchytraeus</i> : Specific Expression of a Putative Aldehyde Dehydrogenase. <i>Biochem.Biophys.Res.Comm.</i> 226[1], 128 134
Media	Wong, M. H. and Bradshaw, A. D. 1982. A Comparison of the Toxicity of Heavy Metals, Using Root Elongation of Rye Grass, <i>Lolium perenne</i> . <i>New Phytol.</i> 91, 255 261
OM, pH	Wood, J. G. and Sibly, P. M. 1950. The Distribution of Zinc in Oat Plants. <i>Aust.J.Sci.Res.</i> 3B, 14 27
Media	Wu, Zhenqiu and Wu, Yuexuan. 1990. Effects of Copper and Zinc on Growth and Superoxide Dismutase Activity of Rice Seedlings. <i>Zhiwu Shengli Xuebao</i> 16[2], 139 146
FL	Xi, Yuying, Guo, Dongsheng, Cheng, Jie, and Song, Yuxian. 1994. Effect of Calcium and Zinc on the Contents of Cadmium and Lead in Corn Seedling. <i>Shanxi Daxue Xuebao, Ziran Kexueban</i> 17[1], 101 103

Mix	Xian, X. 1989. Effect of Chemical Forms of Cadmium, Zinc, and Lead in Polluted Soils on Their Uptake by Cabbage Plants 9078. <i>Plant Soil</i> 113, 257 264
Mix	Xian, X. 1989. Response of Kidney Bean to Concentration and Chemical Form of Cadmium, Zinc, and Lead in Polluted Soils 58157. <i>Environ. Pollut.</i> 57[2], 127 137
Media	Xu, Z., Bowers, N., and Pratt, J. R. 1997. Variation in Morphology, Ecology, and Toxicological Responses of <i>Colpoda inflata</i> (Stokes) Collected from Five Biogeographic Realms. <i>Eur. J. Protistol.</i> 33, 136 144
OM, pH	Zawadzka, T., Mazur, H., Starska, K., Wojciechowska Mazurek, M., Cwiek, K., Brulinska Ostrowska, E., Uminska, R., and Bichniewicz, A. 1990. Content of Metals in Vegetables from Various Regions of Poland in the Years 1986 1988. II. Content of Zinc and Copper. <i>Rocz Panstw Zakl Hig</i> 41[3 4], 132 143
OM, pH	Zhang, F., Romheld, V., and Marschner, H. 1991. Release of Zinc Mobilizing Root Exudates in Different Plant Species as Affected by Zinc Nutritional Status. <i>J. Plant Nutr.</i> 14[7], 675 686
Media	Zhang, Yi, Gu, Weilian, Dai, Junying, and Su, Zhengshu. 1991. Effects of chemicals on superoxide dismutase activity of maize under chilling stress in the middle and late period of growth. <i>Zhiwu Shenglixue Tongxun</i> 27[2], 105 107
FL	Zhmurko, N. G. and Kudryavtseva, N. M. 1996. Effect on Crop Yields of Ammophos Enriched with Zinc Containing Wastes. <i>Agrokhimiya</i> 5[3], 50 53
No Dose	Zupan, M., Hudnik, V., Lobnik, F., and Kadunc, V. 1997. Accumulation of Lead, Cadmium and Zinc from Contaminated Soil in Various Plants and Evaluation of Soil Remediation with Indicator Plant (<i>Plantago lanceolata</i> L.). <i>Colloq. Inst. Natl. Rech. Agron., Contaminated Soils</i> , 85, 325 335

7.4 References Used in Deriving Wildlife TRVs

Agarwal, D. K., Eustis, S., Lamb, J. C. IV, Jameson, C. W., and Kluwe, W. M. 1986. influence of dietary zinc and di(2-ethylhexyl)phthalate-induced testicular atrophy and zinc depletion in adult rats. *Toxicol. Appl. Pharmacol.* (1986) 84(1): 12-24. Ref No. 21084.

Alaoui, L. McClain J. C. and Essatara M. B. 1985. some aspects of biotin and zinc interactions: effects on growth and feed efficiency in the rat. *Nutr. Res. Suppl.* I: 203-208. Ref No. 36854.

Amemiya, Kenjie, Keen, Carl L., and Hurley, Lucille S. 1986. 6-mercaptopurine-induced alterations in mineral metabolism and teratogenesis in the rat. *Teratology* 34(3): 321-34. Ref No. 21069.

Ammerman, C. B. Florida Univ. Gainesville FL USA Dept. of Animal Science, Henry, P. R., and Littell, R. C. 1997. effect of high dietary zinc concentration and length of zinc feeding on feed intake and tissue zinc concentration in sheep. *Animal Feed Science and Technology.* V. 66(1-4) P. 237-245. Ref No. 40409.

Anderson, M. B., K., Lepak, V. Farinas and W. J. George. 1983. Protective action of zinc against cobalt-induced testicular damage in the mouse. *Reprod. Toxicol.* 7(1): 49-54. . Ref No. 139.

Ansari, M. S., Miller, W. J., Neathery, M. W., Lassiter, J. W., Gentry, R. P., and Kincaid, R. L. 1976. zinc metabolism and homeostasis in rats fed a wide range of high dietary zinc levels. *Proc Soc Exp Biol Med.* 152(2): 192-4. Ref No. 14662.

Attia, A. N., Awadalla, S. A., Esmail, E. Y., and Hady, M. M. 1987. role of some microelements in nutrition of

water buffalo and its relation to production. 2. effect of zinc supplementation. *Assiut Veterinary Medical Journal* 18(35): 91-100.. Ref No. 36002.

Aughey, E, Grant, L, Furman, BL, and Dryden, WF. 1977. the effects of oral zinc supplementation in the mouse. *J. Comp. Pathol.* 87: 1. Ref No. 14524.

Aulerich, R. J., Bursian, S. J., Poppenga, R. H., Braselton, W. E. , and Mullaney, T. P. 1991. toleration of high concentrations of dietary zinc by mink. *Journal Of Veterinary Diagnostic Investigation.* 3(3): 232-237. Ref No. 46274.

Bafundo, K. W., Baker, D. H., and Fitzgerald, P. R. 1984. lead toxicity in the chick as affected by excess copper and zinc and by eimeria acervulina infection. *Poult. Sci.* 63(8): 1594-1603. Ref No. 2517.

Bafundo, Kenneth W., Baker, David H., and Fitzgerald, Paul R. 1984. the iron-zinc interrelationship in the chick as influenced by eimeria acervulina infection. *J. Nutr. (1984)* 114(7): 1306-12 . Ref No. 6273.

Baker, David H. and Halpin, Kevin M. 1988. zinc antagonizing effects of fish meal, wheat bran and a corn-soybean meal mixture when added to phytate- and fiber-free casein-dextrose diet. *Nutr. Res. (N. Y.)* 8(2): 213-18 . Ref No. 5917.

Banis, R. J., Pond, W. G., Walker Jr., E. F., and O'Connor, J. R. 1969. dietary cadmium, iron, and zinc interactions in the growing rat. *Proc. Soc. Exp. Biol. Med.* 130(3): 802-806. Ref No. 3733.

Barone, Anthony, Ebesh, Osama, Harper, Rita G., and Wapnir, Raul A. 1998. placental copper transport in rats : effects of elevated dietary zinc on fetal copper, iron and metallothionein. *J. Nutr.* 128(6): 1037-1041 . Ref No. 21042.

Bartov, I. 1995. the use of diets containing high levels of zinc for controlling early growth in female broiler chicks. *Poult. Sci.* 75(4): 547-50 . Ref No. 5373.

Bartov, I., Wax, E., and Bornstein, S. 1994. attempts to achieve low-weight broiler breeder hens by severe growth depression during various periods up to 6 weeks of age and food allocation below the recommendations thereafter. *British Poultry Science* 35(4): 573-84. Ref No. 7956.

Bentley, P. J. and Grubb, B. R. 1991. experimental dietary hyperzincemia tissue disposition of excess zinc in rabbits. *Trace Elem. Med. (1991)* 8(4): 202-7 . Ref No. 40436.

Berg, L. R. and Martinson, R. D. 1972. effect of diet composition of the toxicity of zinc for the chick. *Poultry Sci.* 51(5): 1690-4. Ref No. 93.

Berry, W. D. and Brake, J. 1985. comparison of parameters associated with molt induced by fasting, zinc, and low dietary sodium in caged layers. *Poult. Sci.* 64(11): 2027-36 . Ref No. 6144.

Berry, W. D. and Brake, J. 1991. induced molt increases eggshell quality and calbindin-d28k content of eggshell gland and duodenum of aging hens. *Poultry Science* 70(3): 655-657. Ref No. 7089.

Berry, W. D., Gildersleeve, R. P., and Brake, J. 1987. characterization of different hematological responses during molts induced by zinc or fasting. *Poultry Science* 66(11): 1841-5. Ref No. 8181.

Blalock, Teresa L. and Hill, C. H. 1988. studies on the role of iron in zinc toxicity in chicks. *Biol. Trace Elem. Res. (1988):* 17, 17-29. Ref No. 5868.

Bonner, F. W., King, L. J., and Parke, D. V. 1980. cadmium-induced reduction of bone alkaline phosphatase and its prevention by zinc. *Chem Biol Interact.* 29(3): 369-372. Ref No. 668.

- Brandt, A. 1983. effect of dietary copper and zinc on the haematology of male pastel mink kits: a pilot investigation [iron, fe, blood plasma analysis, 300 ppm copper per kg wet feed highly toxic to mink]. *Scientifur*. 7(2): 61-65. Ref No. 2033.
- Brink, MF, Becker, DE, terrill, SW, and Jensen, AH. 1959. zinc toxicity in the weanling pig. *J. Anim. Sci.* 18: 836. Ref No. 14525.
- Brzoska, M. M., Moniuszko-Jakoniuk, J., Jurczuk, M., Galazyn-Sidorczuk, M., and Rogalska, J. 2001. the effect of zinc supply on cadmium-induced changes in the tibia of rats. *Food and Chemical Toxicology*. 39(7): 729-737. Ref No. 36302.
- Bui, Linh M., Taubeneck, Marie W., Commisso, Joel F., Uriu-Hare, Janet Y., Faber, Willem D., and Keen, Carl L. 1998. altered zinc metabolism contributes to the developmental toxicity of 2-ethylhexanoic acid, 2-ethylhexanol and valproic acid. *Toxicology (1998)* 126(1): 9-21. Ref No. 21045.
- Bunn, Clara R. and Matrone, Gennard. 1966. in vivo interactions of cadmium, copper, zinc, and iron in the mouse and rat. *J. Nutr.* 90(4): 395-399. Ref No. 10493.
- Caster, W. O. and Doster, J. M. 1979. effect of the dietary zinc/ratio on plasma cholesterol level. *Nutrition Reports International* 19(6): 773-775. Ref No. 43230.
- Cerklewski, H. L. 1979. influence of dietary zinc on lead toxicity during gestation and lactation in the female rat. *J NUTR*; 109 (10). 1979. 1703-1709. Ref No. 37008.
- Cerklewski, F. L. and R. M. Forbes, R. M. 1976. Influence of dietary zinc on lead toxicity in the rat. *J. Nutr.* 106(5): 689. Ref No. 2627.
- Chu, Richard C. and Cox, Dennis H. 1970. excessive dietary zinc during lactation and nutritive value and mineral composition of rat 's milk. *Nutr. Rep. Int. (1970)* 2(4): 179-84. Ref No. 42767.
- Chu, Richard C. and Cox, Dennis H. 1972. zinc, iron, copper, calcium, cytochrome oxidase, and phospholipid in rats of lactating mothers fed excess zinc. *Nutr. Rep. Int. (1972)* 6(1): 61-6. Ref No. 42680.
- Coppen, D. E. and Davies, N. T. 1987. studies on the effects of dietary zinc dose on zinc-65 absorption in vivo and on the effects of zinc status on zinc-65 absorption and body loss in young rats. *Br. J. Nutr.* 57(1): 35-44. Ref No. 21071.
- Cox, Dennis H., Schlicker, Sandra A., and Chu, Richard C. 1969. excess dietary zinc for the maternal rat, and zinc, iron, copper, calcium, and magnesium content and enzyme activity in maternal and fetal tissues. *J. Nutr.* (1969) 98(4): 459-66. Ref No. 42838.
- Cox, DH and Hale, OM. 1962. liver iron depletion without copper loss in swine fed excess zinc. *J. Nutr.* 77: 225. Ref No. 14526.
- Davies, NT, Soliman, HS, Corrigan, W, and Flett, A. 1977. the susceptibility of suckling lambs to zinc toxicity. *Br. J. Nutr.* 38: 153. Ref No. 14527.
- Dean, Carlton E., Hargis, Billy M., and Hargis, Pamela S. 1991. effects of zinc toxicity on thyroid function and histology in broiler chicks. *Toxicol. Lett. (1991)* 57(3): 309-18. Ref No. 5681.
- Dewar, W. A., Wight, P. A. L., Pearson, R. A., and Gentle, M. J. 1983. toxic effects of high-concentrations of zinc-oxide in the diet of the chick and laying hen. *British Poultry Science* 24(3): 397&. Ref No. 37018.
- Dhawan, D A. Goel and C. S. Gautam. 1992. effects of zinc intake on liver enzymes in carbon tetrachloride-induced liver toxicity. *Med. Sci. Res.* 20(2): 55-56. Ref No. 48541.

Eisemann, J. H., Pond, W. G., and Thonney, M. L. 1979. effect of dietary zinc and copper on performance and tissue mineral cholesterol concentrations in swine. *Journal of Animal Science* 48(5): 1123-1128. Ref No. 43242.

Elliott, R. J. and Walker, N. 1968. effect of dietary zinc on the growth rate and on the zinc and pigment contents of blood and muscle in the pig. *IR J AGR RES.* 7 (1). 1968 131-133. Ref No. 38623.

Elsenhans, B., Beck, R., Strugala, G., Forth, W., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. oral doses of bismuth, dietary zinc supply and trace-metal levels in the rat. <document title>trace elements in man and animals - tema 8:proceedings of the eighth international symposium on trace elements in man and animals. 928-932. Ref No. 34167.

Evenson, D. P., Emerick, R. J., Jost, L. K., Kayongo-Male, H., and Stewart, S. R. 1993. zinc-silicon interactions influencing sperm chromatin integrity and testicular cell development in the rat as measured by flow cytometry. *J Anim Sci.* 71(4): 955-62. Ref No. 14660.

Ferguson, H. W. and Leaver, A. G. 1972. effects of diets high in zinc at different levels of calcium and vitamin d on the rat humerus and incisor. *Calcif. Tissue Res. (1972)* 8(4): 265-75. Ref No. 42635.

FOOD, A. N. D. DRUG RESEARCH LABS. I. 1974. teratologic evaluation of compound fda 71-49, zinc sulfate, in rabbits. *NTIS PB REPORT (PB-267 191):15 PP,1974* Ref No. 42292.

FOOD, A. N. D. DRUG RESEARCH LABS. I. 1973. teratologic evaluation of fda 71-49 (zinc sulfate). *NTIS PB REPORT (PB-221 805):41 PP,1973.* Ref No. 42889.

Gasaway, W. C. and Buss, I. O. 1972. zinc toxicity in the mallard duck. *Journal of Wildlife Management.* 36(No.4): 1107-1117. Ref No. 9261.

Gautam, R. K., Khan, R., and Tejeshwarilal. 2001. effect of the heavy metals on calcium and the activity of iron in the albino rats. *Journal of Ecotoxicology & Environmental Monitoring [j. Ecotoxicol. Environ. Monitoring]. Vol. 11, No. 3-4, Pp. 177-180. Jul-Oct 2001.* Ref No. 36346.

Gaynor, P. J., Montgomery, M. J., and Holmes, C. R. 1988. effect of zinc chloride on zinc sulfate treatment of protein supplement on milk production. *Journal of Dairy Science.* 71 (8). 1988. 2175-2180. Ref No. 47892.

Gibson, S. W., Stevenson, Mary H., and Jackson, N. 1986. comparison of the effects of feeding diets supplemented with zinc oxide or zinc acetate on the performance and tissue mineral content of mature female fowls. *Br. Poult. Sci. (1986)* 27(3): 391-402. Ref No. 6048.

Hamilton, R. P., Fox, M. R. S., Fry, B. E. Jr., Jones, A. O. L., and Jacobs, R. M. 1979. zinc interference with copper, iron and manganese in young japanese quail. *J. Food Sci.* 44(3): 738-41. Ref No. 6655.

Hamilton, R. P., Fox, M. R. S., Tao, S. H., and Fry, B. E. Jr. 1981. zinc-induced anemia in young japanese quail ameliorated by supplemental copper and iron. *Nutr. Res. (N. Y.)* 1(6): 589-99. Ref No. 6403.

Harland, B. F., Fox, M. R. Spivey, and Fry, Bert E. Jr. 1965. protection against zinc deficiency by prior excess dietary zinc in young japanese quail. *J. Nutr.* 105(12): 1509-18. Ref No. 6887.

Henry, P. R., Ammerman, C. B., and Miles, R. D. 1987. effect of dietary zinc on tissue mineral concentration as a measure of zinc bioavailability in chicks. *Nutr. Rep. Int.* 35(1): 15-23 Ref No. 6039.

Hill, C. H. 1990. effect of dietary copper on vanadate toxicity in chicks. *Biol. Trace Elem. Res. (1990)* : Volume Date 1989, 23, 17-23. Ref No. 5734.

Hill, C. H. 1989. effect of salmonella gallinarum infection on zinc metabolism in chicks. *Poult. Sci.* 68(2): 297-305. Ref No. 5841.

- Hill, C. H. 1974. influence of high levels of minerals on the susceptibility of chicks to salmonella gallinarum. *J Nutr.* 104(10): 1221-1226. Ref No. 92.
- Hill, C. H. 1974. reversal of selenium toxicity in chicks by mercury copper and cadmium. *J NUTR.* 104(5): 593-598. Ref No. 1369.
- Hill, G. M. and Miller, E. R. 1983. effect of dietary zinc levels on the growth and development of the gilt. *Journal Of Animal Science* 57(1): 106-113. Ref No. 45270.
- Hill, G. M., Miller, E. R., and Ku, P. K. 1983. effect of dietary zinc levels on mineral concentration in milk. *Journal of Animal Science* 57(1): 123-129. Ref No. 45142.
- Hill, G. M., Miller, E. R., and Stowe, H. D. 1983. effect of dietary zinc levels on health and productivity of gilts and sows through two parities. *Journal of Animal Science* 57(1): 114-122. Ref No. 45143.
- Hill, G. M., Miller, E. R., Whetter, P. A., and Ullrey, D. E. 1983. concentration of minerals in tissues of pigs from dams fed different evels of dietary zinc. *Journal of Animal Science* 57(1): 130-138. Ref No. 35659.
- Hirsch, Kenneth S. and Hurley, Lucille S. 1978. relationship of dietary zinc to 6-mercaptopurine teratogenesis and dna metabolism in the rat. *Teratology* 17(3): 303-13. Ref No. 21139.
- Hsu, FS, Krook, L, Pond, WG, and Duncan, JR. 1975. interactions of dietary calcium with toxic levels of lead and zinc in pigs. *J. Nutr.* 105: 112. Ref No. 14376.
- Huerta, M. R. L. Kincaid J. D. Cronrath J. Busboom A. B. Johnson and C. K. Swenson. 2002. *Interaction of Dietary Zinc and Growth Implants on Weight Gain, Carcass Traits and Zinc in Tissues of Growing Beef Steers and Heifers* *Animal Feed Science and Technology.* 95: 15-32. Ref No. 25973.
- Jackson, N., Gibson, S. W., and Stevenson, M. H. 1986. effects of short- and long-term feeding of zinc oxide-supplemented diets on the mature, female domestic fowl with special reference to tissue mineral content. *Br. J. Nutr.* 55(2): 333-49. Ref No. 6133.
- Jaw, Sarah and Jeffery, Elizabeth H. 1988. the effect of dietary zinc status on biliary metal excretion of rats. *J. Nutr.* 118(11): 1385-90. Ref No. 36967.
- Jensen, L. S. and Maurice, D. V. 1980. dietary chromium and interior egg quality. *Poultry Science.* 59 (2). 1980. 341-346. Ref No. 9749.
- Kadiiska, M., Stoytchev, T., and Serbinova, E. 1985. on the mechanism of the enzyme-inducing action of some heavy metal salts. *Archives of Toxicology.* 56(3): 167-9. Ref No. 19290.
- Kalamah, M. A., El-Fiky, A. A., and Zeweil, H. S. 1995. effect of different molting programs on productive and some physiological parameters in norfa and fayoumi hens. *Egyptian Journal of Animal Production* 32(2): 253-268. Ref No. 6735.
- Karouani, R. Essatara M. B. McClain C. J. and Ettalibi M. 1985. some aspects of zinc and phytate interactions: their effects on growth and phytase activity in the gut of rodents. *Nutr.Res. Suppl.*I: 238-243. Ref No. 36897.
- Katouli, M., Melin, L., Jensen-Waern, M., Wallgren, P., and Mollby, R. 1999. the effect of zinc oxide supplementation on the stability of theintestinal flora with special reference to composition of coliforms inweaned pigs. *Journal of Applied Microbiology* 87(4): 564-573. Ref No. 38511.
- Katya-Katya, M., Ensminger, A., Mejean, L., and Debry, G. 1984. the effect of zinc supplementation on plasma cholesterol levels. *Nutrition Research* 4(4): 633-638. Ref No. 45042.

- Kaya, S. H. D. Umucalilar S. Haliloglu and H. Ipek. 2001. effect of dietary vitamin a and zinc on egg yield and some blood parameters of laying hens. *Turkish Journal of Vet. Anim. Sci.* 25: 763-769 . Ref No. 48543.
- Ketcheson, M. R., Barron, G. P., and Cox, D. H. 1969. relationship of maternal dietary zinc during gestation and lactation to development and zinc, iron and copper content of the postnatal rat. *Journal of Nutrition* 98(3): 303-11. Ref No. 37837.
- Khera, K. S. and Shah, B. G. 1979. failure of zinc acetate to reduce ethylenethiourea-induced fetal anomalies in rats. *Toxicol. Appl. Pharmacol.* (1979) 48(2): 229-35 . Ref No. 21134.
- Kincaid, R. L., Miller, W. J., Jensen, L. S., Hampton, D. L., Neathery, M. W., and Gentry, R. P. 1976. effect of high amounts of dietary zinc and age upon tissue zinc in young chicks. *Poult. Sci.* (1976) 55(5): 1954-7 . Ref No. 6840.
- Kumar, S. 1976. effect of zinc supplementation on rats during pregnancy. *Nutrition Reports International* 13(1): 33-36. Ref No. 43587.
- L'Abbe, Mary R. and Fischer, Peter W. F. 1984. the effects of dietary zinc on the activity of copper-requiring metalloenzymes in the rat. *J. Nutr.* (1984) 114(5): 823-8 . Ref No. 36982.
- L'Abbe, Mary R. and Fischer, Peter W. F. 1984. the effects of high dietary zinc and copper deficiency on the activity of copper-requiring metalloenzymes in the growing rat. *J. Nutr.* (1984) 114(5): 813-22 . Ref No. 36983.
- Leeson, S. and Summers, J. D. 1982. effect of high dietary levels of supplemental zinc manganese copper or iron on broiler performance to 3 weeks of age and accumulation of these minerals in tissue and excreta. *Nutr Rep Int.* 25(3): 591-599. Ref No. 2196.
- Lefevre, M., Heng, H., and Rucker, R. B. 1982. dietary cadmium, zinc and copper: effects on chick lung morphology and elastin cross-linking. *J Nutr.* 112(7): 1344-52. Ref No. 392.
- Llewellyn, G. C., Floyd, E. A., Hoke, G. D., Weekley, L. B., and Kimbrough, T. D. 1985. influence of dietary aflatoxin, zinc, and copper on bone size, organ weight, and body weight in hamsters and rats. *Bull Environ Contam Toxicol.* 35(2): 149-56. Ref No. 2203.
- Lu, J. X., Combs, G. F. Jr, and Fleet, J. C. 1990. time-course studies of pancreatic exocrine damage induced by excess dietary zinc in the chick. *Journal of Nutrition* 120(4): 389-97. Ref No. 8008.
- Lu, Junxuan and Combs, Gerald F. Jr. 1988. effect of excess dietary zinc on pancreatic exocrine function in the chick. *J. Nutr.* (1988) 118(6): 681-9 . Ref No. 5903.
- Lu, Junxuan and Combs, Gerald F. Jr. 1988. excess dietary zinc decreases tissue .alpha.-tocopherol in chicks. *J. Nutr.* 118(11): 1349-59 . Ref No. 5866.
- Maita, K., Hirano, M., Mitsumori, K., Takahashi, K., and Shirasu, Y. 1981. subacute toxicity studies with zinc sulfate in mice and Rats. *J Pestic Sci (Nihon Noyaku Gakkaishi)*; 6 (3). 327-336. Ref No. 43680.
- Mandour, A. and Korshom, M. 1992. lipids and lipoprotein patterns in broiler chickens supplemented with high dietary zinc. *Egypt. J. Biochem.* (1992) 10(2): 404-11. Ref No. 5530.
- Mehring, AL Jr., Brumbaugh, JH, and Titus, HW. 1956. a comparison of the growth of chicks fed diets containing different quantities of zinc. *Poult. Sci.* 35: 956. Ref No. 14531.
- Mengo, M., Lopez, C., D'ocon, C., Frasset, I., and De Armino V A. 1991. studies on different zinc acetate doses and their relationships with some biochemical parameters. *Medical Science Research.* 19 (6). 1991. 171-172. Ref No. 21240.

- Miller, W. J., Amos, H. E., Gentry, R. P., Blackmon, D. M., Durrance, R. M., Crowe, C. T., Fielding, A. S., and Neathery, M. W. 1989. long-term feeding of high zinc sulfate diets to lactating and gestating dairy cows. *J Dairy Sci.* 72(6): 1499-508. Ref No. 14685.
- Miller, WJ, Blackmon, DM, Gentry, RP, and Pate, FM. 1970. effects of high but nontoxic levels of zinc in practical diets on 65zn and zinc metabolism in holstein calves. *J. Nutr.* 100: 893. Ref No. 14533.
- Miller, WJ, Clifton, CM, Fowler, PR, and Perkins, HF. 1965. influence of high levels of dietary zinc on zinc in milk, performance and biochemistry of lactating cows. *J. Dairy Sci.* 48: 450. Ref No. 14532.
- Mohanna, C. and Nys, Y. 1999. effect of dietary zinc content and sources on the growth, body zinc deposition and retention, zinc excretion and immune response in chickens. *Br. Poult. Sci.* 40(1): 108-114. Ref No. 5090.
- Mutafova-Yambolieva, V., Staneva-Stoytcheva, D., Lasova, L., and Radomirov, R. 1993. effects of subchronic exposure of rats to lead or zinc on .alpha.-adrenoceptor-mediated contractile responses in isolated vas deferens. *Acta Physiol. Pharmacol. Bulg. (1993)* 19(4): 111-19. Ref No. 39780.
- Nakamura, K., Nishiyama, S., Takata, T., Suzuki, E., Sugiura, Y., Kobayashi, T., and Chao, B. Y. 1983. effects of zinc on cadmium-induced alterations in hepatic functions and blood glucose of rats. *Environ Res.* 30(1): 175-81. Ref No. 638.
- Newman, H. M. R. S. H. Yang and K. R. Magnusson. 2002. effects of developmental exposure to lead, manganese and zinc mixtures on spatial learning and expression of nmda receptor subunit mrna in fischer 344 rats. *Toxicology Letters.* 126(2): 107-119. Ref No. 48540.
- O'Neil-Cutting, M. A., Bomford, A., and Munro, H. N. 1981. effect of excess dietary zinc on tissue storage of iron in rats. *J Nutr.* 111(11): 1969-79. Ref No. 14656.
- Ogiso, T., Moriyama, K., Sasaki, S., Ishimura, Y., and Minato, A. 1974. inhibitory effect of high dietary zinc on copper absorption in rats. *Chemical & Pharmaceutical Bulletin* 22(1): 55-60. Ref No. 42961.
- Oh, S. H., Nakaue, H., Deagen, J. T., Whanger, P. D., and Arscott, G. H. 1979. accumulation and depletion of zinc in chick tissue metallothioneins. *J. Nutr.* 109(10): 1720-9. Ref No. 6627.
- Ott, EA, Smith, WH, Harrington, RB, and Beeson, WM. 1966. zinc toxicity in ruminants. i. effect of high levels of dietary zinc on gains, feed consumption and feed efficiency in lambs. *J. Anim. Sci.* 25: 414. Ref No. 14535.
- Ott, EA, Smith, WH, Harrington, RB, Parker, HE, and Beeson, WM. 1966. zinc toxicity in ruminants. iv. physiological changes in tissues of beef cattle. *J. Anim. Sci.* 25: 432. Ref No. 14536.
- Ott, EA, Smith, WH, Harrington, RB, Stob, M, Parker, HE, and Beeson, WM. 1966. zinc toxicity in ruminants. iii. physiological changes in tissues and alterations in rumen metabolism in lambs. *J. Anim. Sci.* 25: 424. Ref No. 14537.
- Pal, N. and Pal, B. 1987. zinc feeding and conception in the rats. *Int J Vitam Nutr Res.* 57(4): 437-40. Ref No. 14664.
- Palafox, A. L. and Ho-A, Elodie. 1980. effect of zinc toxicity in laying white leghorn pullets and hens. *Poult. Sci.* (1980) 59(9): 2024-8. Ref No. 6545.
- Perry, H. Mitchell Jr., Erlanger, Margaret W., Perry, Elizabeth F., and Blotcky, Allan J. 1980. inhibition of cadmium-induced hypertension in rats. *Sci. Total Environ. (1980)* 14(2): 153-66. Ref No. 21131.

- Pettersen, A. J., R.A. Andersen, and K. E. Zachariassen. 2002. Effects of dietary intake of trace metals on tissue contents of sodium and calcium in mice (*Mus musculus*). *Comparative biochemistry and physiology. Toxicology & pharmacology* : cbp, 2002 may, 132(1):53-60. Ref No. 36374.
- Pimentel, Julio L., Cook, Mark E., and Greger, J. L. 1992. anemia induced by ingestion of excess zinc in chicks: importance of red blood cell turnover. *Journal of Nutritional Biochemistry* (1992) 3(3): 146-50 . Ref No. 5617.
- Pimentel, Julio L., Greger, J. L., Cook, Mark E., and Stahl, James L. 1992. iron metabolism in chicks fed various levels of zinc and copper. *J. Nutr. Biochem.* (1992) 3(3): 140-5. Ref No. 5619.
- Rama, R. and Planas, J. 1981. effects of dietary zinc on iron metabolism in chickens. *Biol. Trace Elem. Res.* 3(4): 287-99 . Ref No. 6435.
- Rana, S. V. S., Prakash, R., Kumar, A., and Sharma, C. B. 1985. a study of glycogen in the liver of metal-fed rats. *TOXICOL LETT* . 29(1): 1-4. Ref No. 13236.
- Reeves, P. G., Rossow, K. L., Bobilya, D. J., Reeves, P. G., Rossow, K. L., and Bobilya, D. J. 1993. zinc-induced metallothionein and copper metabolism in intestinal mucosa, liver, and kidney of rats. *Nutrition Research* 13(12): 1419-1431. Ref No. 37015.
- Reeves, Philip G. 1995. adaptation responses in rats to long-term feeding of high-zinc diets: emphasis on intestinal metallothionein. *J. Nutr. Biochem.* (1995) 6(1): 48-54 . Ref No. 39430.
- Reeves, Philip G. and Newman, Samuel M. Jr. 1997. ultrastructural changes in the intestine of rats fed high-zinc diets . *J. Trace Elem. Exp. Med.* (1997) 10(1): 37-46. Ref No. 21067.
- Roberson, RH and Schaible, PJ. 1960. the tolerance of growing chicks for high levels of different forms of zinc. *Poult. Sci.* 39: 893. Ref No. 14538.
- Rosa, I. V., Ammerman, C. B., and Henry, P. R. 1986. interrelationships of dietary copper, zinc and iron on performance and tissue mineral concentration in sheep. *Nutrition Reports International* 34(5): 893-902. Ref No. 47007.
- Sandoval, M., Henry, P. R., Ammerman, C. B., Miles, R. D., and Littell, R. C. 1997. relative bioavailability of supplemental inorganic zinc sources for chicks. *J. Anim. Sci.* 75(12): 3195-3205 . Ref No. 5247.
- Sandoval, M., Henry, P. R., Littell, R. C., Miles, R. D., Butcher, G. D., and Ammerman, C. B. 1999. effect of dietary zinc source and method of oral administration on performance and tissue trace mineral concentration of broiler chicks. *J. Anim. Sci.* 89(7): 1788-1799 . Ref No. 5067.
- Sandoval, M., Henry, P. R., Luo, X. G., Littell, R. C., Miles, R. D., and Ammerman, C. B. 1998. performance and tissue zinc and metallothionein accumulation in chicks fed a high dietary level of zinc. *Poultry Science* 77(9): 1354-63. Ref No. 7245.
- Schell, T. C. and Kornegay, E. T. 1996. zinc concentrations in tissues and performance of weanling pigs fed pharmacological levels of zinc from zno, zn-methionine, zn-lysine, or znso4. *Journal of Animal Science* 74(7): 1584-1593. Ref No. 42234.
- Schisler, D. K. and Kienholz, E. W. 1967. interactions of dietary zinc and vitamin d in laying hens. *Poultry Science* 46(4): 918-24. Ref No. 8798.
- Schlicker, S. A. and Cox, D. H. 1968. maternal dietary zinc, and development and zinc, iron, and copper content of the rat fetus. *J Nutr.* 95: 287-294. Ref No. 25.
- Scott, A. S. and Magee, A. C. 1979. CS Dep. Food Nutrition and Food Service Economics Univ. North Carolina

- Greensboro N. C. 27412 USA. 1979. permanency of biological changes in young rats fed a high zinc diet. *Nutrition Reports International* 20(4): 549-559. Ref No. 43264.
- Seidenberg, J. M., Anderson, D. G., and Becker, R. A. 1986. validation of an in vivo developmental toxicity screen in the mouse. *Teratog Carcinog Mutagen.* 6: 361-374. Ref No. 113.
- Settlemyre, C. T. and Matrone, G. 1967. in vivo interference of zinc with ferritin iron in the rat. *Journal of Nutrition* 92(2): 153-8. Ref No. 38015.
- Shankar, S., Sundaresan, P. R., and Mohla, S. 1986. effect of chronic administration of excess dietary vitamin a and zinc on lipid metabolism in rats. *International Journal For Vitamin And Nutrition Research.* 56(4): 329-337. Ref No. 46830.
- Shrader, Ruth E., Hirsch, Kenneth S., Levin, Jacqueline, and Hurley, Lucille S. 1978. attenuating effect of zinc on abnormal placental morphology in 6-mercaptopurine treated rats. *Teratology* 17(3): 315-25. Ref No. 21138.
- Sinha, A., Bedwal, R. S., and Mathur, R. S. 1989. biochemical study of female reproductive organs in swiss albino rats on a high zinc diet. *Trace Elem. Med. (1989)* 6(2): 86-92. Ref No. 21006.
- Southern, L. Lee and Baker, David H. 1983. zinc toxicity, zinc deficiency and zinc-copper interrelationship in eimeria acervulina-infected chicks. *J. Nutr.* 113(3): 688-96. Ref No. 6368.
- Stahl, J. L., Greger, J. L., and Cook, M. E. 1990. breeding-hen and progeny performance when hens are fed excessive dietary zinc. *Poult. Sci. (1990)* 69(2): 259-63. Ref No. 5764.
- Stahl, J. L., Greger, Janet L., and Cook, M. E. 1989. zinc, copper and iron utilization by chicks fed various concentrations of zinc. *Br. Poult. Sci. (1989)* 30(1): 123-34. Ref No. 5820.
- Stepinska, Malgorzata, Fabianska, Irena, and Niemiec, Jan. 1988. performance of hens in the second egg production cycle after the intermission caused by addition of zinc to the feed. *Ann. Warsaw Agric. Univ. SGGW-AR Anim. Sci. ((21)):* 71-5. Ref No. 5770.
- Stevenson, M. H., Jackson, N., and Gibson, S. W. 1987. withdrawal of zinc oxide-containing diets from mature, female domestic fowl: effects on laying performance and the weights of selected tissues. *British Poultry Science* 28(3): 437-47. Ref No. 8184.
- Subramanian P(A), Sivabalan, S., Menon Venugopal P, and Vasudevan, K. 2000. influence of chronic zinc supplementation on biochemical variables and circadian rhythms in wistar rats. *Nutrition Research.* 20(3): 413-425. Ref No. 21011.
- Tantcheva, L., Stoytchev, Tz., Mehandjieva, E., and Tivcheva, L. 1993. liver and kidney monooxygenase activity in rats subchronically treated with zn and pb salts and their combination. *Methods Find. Exp. Clin. Pharmacol. (1993)* 15(10): 715-19. Ref No. 39802.
- Thawley, D. G. Pratt S. E. and Selby L. A. 1978. antagonistic effect of zinc on increased urine-aminolevulinic acid excretion in lead-intoxicated rats. *Environ. Res.* 15(2): 218-226. Ref No. 36953.
- Tran, C. D., Butler, R. N., Howarth, G. S., Philcox, J. C., Rofe, A. M., and Coyle, P. 1999. regional distribution and localization of zinc and metallothionein in the intestine of rats fed diets differing in zinc content. *Scand. J. Gastroenterol. (1999)* 34(7): 689-695. Ref No. 21015.
- Urabe, Kimiko and Hayakawa, Fumiko. 1990. relationship between zinc and cellulose intakes in growing rats. *Int. J. Vitam. Nutr. Res. (1990)* 60(2): 159-67. Ref No. 40997.
- Van Der Schree W, Garretsen, J. W., and Van Der Berg R. 1980. effect of zinc and molybdenum supplementation of

the feed concentrate on the storage of copper in the liver of lambs. *Veterinary Quarterly*. 2 (2). 1980. 82-89. Ref No. 21171.

Van Vleet, J. F., Boon, G. D., and Ferrans, V. J. 1981. induction of lesions of selenium-vitamin e deficiency in ducklings fed silver, copper, cobalt, tellurium, cadmium, or zinc: protection by selenium or vitamin e supplements. *Am J Vet Res*. 42(7): 1206-1217. Ref No. 80.

Van Vleet, J. F., Boon, G. D., and Ferrans, V. J. 1981. induction of lesions of selenium-vitamin e deficiency in weanling swine fed silver, cobalt, tellurium, zinc, cadmium, and vanadium. *Am J Vet Res*. 42(5): 789-799. Ref No. 149.

Vohra, P and Kratzer, FH. 1968. zinc, copper and manganese toxicities in turkey poults and their alleviation by edta. *Poult. Sci*. 47: 699. Ref No. 14404.

Wapnir, Raul A. and Lee, Shih Yu. 1993. dietary regulation of copper absorption and storage in rats : effects of sodium, zinc and histidine-zinc. *J. Am. Coll. Nutr.* (1993) 12(6): 714-19 . Ref No. 39821.

Webster, W. S. 1979. cadmium-induced fetal growth retardation in mice and the effects of dietary supplements of zinc, copper, iron and selenium. *J.Nutr*. 109(9): 1646-1651. Ref No. 823.

Weigand, E. and Kirchgessner, M. 1978. homeostatic adjustments in zinc digestion to widely varying dietary zinc intake . *Nutr. Metab.* (1978) 22(2): 101-12 . Ref No. 41855.

Whanger, P. D. and Weswig, P. H. 1970. effect of some copper antagonists on induction of ceruloplasmin in the rat. *Journal of Nutrition* 100(3): 341-8. Ref No. 22300.

Wight, P. A L. and Dewar, W. A. Saunderson C. L. 1986. zinc toxicity in the fowl ultrastructural pathology and relationship to selenium lead and copper. *AVIAN PATHOL*. 15(1): 23-38. Ref No. 1624.

Willoughby, RA, Thirapatsakum, T, and McSherry, BJ. 1972. influence of rations low in calcium and phosphorus on blood and tissue lead concentrations in the horse. *Am. J. Vet. Res*. 33: 1165. Ref No. 14385.

Yamaguchi, M., Mochizuki, A., and Okada, S. 1982. stimulatory effect of zinc on bone growth in weaning rats. *Journal of Pharmacobio-Dynamics*. 5 (8). 1982. 619-626. Ref No. 37010.

Zhang, Peng, Duhamel, Gerald E., Mysore, Jagannatha V., Carlson, Michael P., and Schneider, Norman R. 1995. prophylactic effect of dietary zinc in a laboratory mouse model of swine dysentery. *Am. J. Vet. Res.* (1995) 56(3): 334-9 . Ref No. 39356.

7.5 References Rejected for Use in Derivation of Wildlife TRV

These references were reviewed and rejected for use in derivation of the Eco-SSL. The definition of the codes describing the basis for rejection is provided at the end of the reference sections.

Diss	1044657 ORDER NO: AADDX-84482
Mix	28 days subacute oral toxicity study in rats (gavage). EPA/OTS; Doc #88-900000191
Acu	3-pyridylmethylthiocarbamates. U.S. Division of U.S. Ser. No. 591,581. CODEN: USXXAM : 5 pp.
Abstract	1971.Abstacts of Technical Reports Supported by the Office of Naval Research 1970. ABS-2;

- Diss** age, nutrition, and bone metabolism: analyses of effects using a short-term in vivo bone model . 0969983 ORDER NO: AAD87-25572
- Diss** alteration in cadmium transport as a mechanism of resistance to reproductive toxicity in murine strain a/j (zinc, testicular toxicity). 01669567 ORDER NO: AAD99-06384
- Diss** alterations in functionality of lymphocyte populations induced by zinc deficiency. 811552 ORDER NO: AAD83-08922
- Rev** 1979. altered immune responses in zinc deficiency in rodents. *Nutrition Reviews* 37 (7): 234-235.
- Diss** altered zinc metabolism and its sequelae during dietary zinc deficiency and stress. 01423394 ORDER NO: AADAA-I9521360
- Not Avail** amino acid metal complexes using hydrolyzed protein as the amino acid source and methods re same. U.S. 11 pp.
- Diss** analgesia, tolerance and dependence with heroin -, laam - and hydromorphone zinc tannate preparations. 748941 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.
- Diss** the antagonistic effect of cadmium upon zinc metabolism in mice as assessed by immunocompetence. 849558 ORDER NO: AAD84-16074
- Diss** antioxidants and age-related maculopathy (vision, carotenoid). 01587062 ORDER NO: AAD97-23742
- No Tox** application of phytase in feed having low content of phytate. PCT Int. Appl. 24 pp..
- Mix** aqueous feed additive comprising lactic acid, organic acid and chelated trace elements. PCT Int. Appl. 15 pp.
- No Oral** 1997. asian economic upheaval: effects on australian commodities. *Australian Commodities* 4(4): 503-516.
- Diss** aspects of the regulation and function of metallothionein in the mouse (copper, zinc regulation, development). 836343 ORDER NO: AAD84-04942
- Diss** assessment of artificial plasma volume expansion in malnourished rats: effects on the conceptus (fetal growth). 01204155 ORDER NO: AAD92-02782
- Diss** assessment of zinc nutriture in rats and humans. 774005 ORDER NO: AAD82-06013
- Diss** bioavailabilities of copper in copper proteinate, copper lysine and cupric sulfate, and copper tolerances of holstein and jersey cattle. 01423392 ORDER NO: AADAA-I9521355
- Diss** bioavailability of zinc to rats from soy flour and chicken based diets. 824684 ORDER NO: AAD83-24066. The Bioavailability of Intrinsic and Extrinsic (⁶⁵Zn) to Rats From
- Diss** biological properties of the l. pneumophila exoprotease fraction. 0984122 ORDER NO: AAD88-03953

- Diss** brain oxidative stress following zinc deficiency and hyperoxia exposure. 01598116 ORDER NO: AADNN-20509
- Diss** buffer participation in enzyme regulation: the catalytic activity of carbonic anhydrase and its modified analogues. 1016811 ORDER NO: AAD88-10566
- Diss** the characteristics of reptilian keratins: an analysis of the molecular events associated with the evolution of the vertebrate epidermis. 690971 ORDER NO: AAD80-17033
- Diss** characterization and metabolism of alpha-2u-globulin -- a male sex-dependent protein of the rat. 838449 ORDER NO: AAD84-00485
- Diss** characterization, fate and environmental risk assessment of microbial, elemental and toxic components of fractionated broiler litter during storage and reutilization. 01295605 ORDER NO: AAD93-16361
- Diss** characterization of avian immune response genes expressed during development and cellular activation|. 01673822 ORDER NO: AAD99-09754
- Diss** characterization of dgataa/pannier and analysis of the regulation of the dgataa/pannier late embryonic expression pattern in the amnioserosa and dorsal ectoderm (drosophila). 01510450 ORDER NO: AAD96-32812
- Diss** characterization of dna-binding proteins which regulate expression of the chicken apo very low-density lipoprotein ii gene. 01394008 ORDER NO: AADNN-90263
- Diss** characterization of the adherens junction protein zyxin: its role in cell-substratum adhesion. 01280659 ORDER NO: AAD93-08491
- Diss** characterization of the biological activities of porcine interleukin-6 (antibody production). 01451573 ORDER NO: AADAA-I9541358
- Diss** characterization of transcription repression by the yin-yang 1 protein (yy1) by mutagenesis and identification and characterization of a potential yy1-interacting cellular factor. 01565879 ORDER NO: AAD97-21538
- No Oral** chemical sterilization of reproductive organs. *Fr. Demande* : 12 pp.
- Diss** chronic lead intoxication in the rhesus monkey. 793908 ORDER NO: AAD82-20890
- Diss** cloning and characterisation of a novel zinc finger protein that interacts with p75ntr (nerve growth factor, brain derived neurotrophic factor, trka). 01689892 ORDER NO: AAD99-17329
- Diss** cloning and characterization of the mouse ret finger protein (rfp), a b box zinc finger protein. 01500570 ORDER NO: AAD96-26086
- No Oral** coated veterinary implants of growth hormone. *Eur. Pat. Appl.* 11 pp.
- Diss** cobalt ion absorption kinetics and interactions with zinc and iron in the rat. 01431653 ORDER NO: AADAA-I9529542
- Diss** comparative study of vertebrate collagenases from mammalian and amphibian sources. 910784 ORDER NO: AAD86-03803
- Chem Meth** complexes [metal-amino acid] and their use as feed additives. *Fr. Demande* : 12 pp..

- Mix** 1977. concentration of total zinc in some organs in rats. *Acta Universitatis Agriculturae Brno, Facultas Agronomica* 25(3): 139-143.
- Diss** copper absorption from the small intestine of the chicken (*Gallus domesticus*) (metallothionein, estrogen). 845064 ORDER NO: AAD84-12711
- Diss** copper and lead bioavailability from vegetarian and omnivore diets. 876996 ORDER NO: AAD85-04816
- Nut def** 1983. copper deficiency and developmental emphysema. *Nutrition Reviews* 41(10): 318-20.
- Diss** copper deficiency in the rat--sex differences and the influence of dietary factors. 01095906 ORDER NO: AADDX-88033
- Nut def** 1985. copper deficiency induced by megadoses of zinc. *Nutrition Reviews* 43(5): 148-149.
- Diss** crystal structure of a zinc finger/dna complex: a framework for understanding how zinc fingers recognize dna. 01183741 ORDER NO: AAD91-32704
- Diss** cytokine binding and scavenging functions of alpha-2-macroglobulin. 01386392 ORDER NO: AADMM-88805
- Diss** development, characterization and initial analyses of cysteine-rich intestinal protein transgenic mice (thymic, lymphocytes). 01598405 ORDER NO: AAD98-00090
- Diss** development of a cloning system for gene expression in *Pasteurella multocida*. 01295811 ORDER NO: AAD93-16820
- Org Met** development of a toxicant delivery system utilizing rodent grooming behavior (pest control). 01205488 ORDER NO: AAD92-07313
- Diss** development of gaba(b) binding site distribution and pharmacology in rat brain. 01371030 ORDER NO: AAD94-23334
- Diss** developmental regulation of metals by metallothionein: genetically altered mice as a model. 01652668 ORDER NO: AADMQ-28603
- Unrel** dietary supplement for preventing or reducing shedding of hair. *PCT Int. Appl.* 17 pp..
- Org Met** dietary supplementation with essential metal picolinates. *U. S. Pat. Appl.* 14 pp. Avail. NTIS Order No. PAT-APPL-176 234..
- Diss** the distribution and binding of zinc in the rat hippocampus. 835563 ORDER NO: AAD84-03127
- Diss** divergent effects of zinc, protein and energy deficiencies on skeletal muscle mass, muscle fiber diameter and serum insulin-like growth factor-1 concentration in growing rats. 01675181 ORDER NO: AADMQ-32222
- Drug** drugs for the treatment of skin disorders and tumors containing catecholic butanes and zinc compounds. *PCT Int. Appl.* 88 pp.
- Diss** ecophysiology of the common cockle (*Cerastoderma edule* L.) in southampton water, with particular reference to pollution (england). 1092481 ORDER NO: AADDX-87466
- Diss** the effect of a zinc deficiency and alcohol intake during gestation in the rat. 0976109 ORDER

NO: AAD87-29637

- Diss** effect of cellular zinc concentration on glucocorticoid induced gene expression (steroid hormones). 01503749 ORDER NO: AAD96-29153
- Diss** effect of chronic alcoholism on the metabolism of the trace elements zinc, copper and iron in developing rats original title: efectos del alcoholismo cronico sobre el metabolismo de los oligoelementos zinc, cobre y hierro en ratas en crecimiento. 1042300 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.
- Diss** the effect of chronic maternal ethanol consumption on maternal and fetal nutritional status and on protein synthesis in the fetus (alcohol syndrome). 839365 ORDER NO: AAD84-06966
- Diss** the effect of dietary zinc deficiency of polyamines, polyphosphates and membrane skeleton proteins in the rat erythrocyte. 01225235 ORDER NO: AADNN-67919
- Diss** the effect of e. coli endotoxin in the metabolic responses of wistar rats (escherichia coli). 1018130 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.
- Diss** the effect of low dietary zinc on outcome of primary and challenge nematode infections in mice (heligmosomoides polygyrus). 01248318 ORDER NO: AADMM-66413
- Diss** the effect of ovariectomy and dietary factors on bone metabolism and calcium homeostasis in rats. 952520 ORDER NO: AAD87-09460
- Diss** the effect of peripheral deafferentation on specific axonal systems and glial elements in the main olfactory bulb of the rat. 01466062 ORDER NO: AADAA-IMM01871
- Diss** effect of selected dietary fibers on zinc availability in the rat. 865473 ORDER NO: AAD84-26960
- Diss** effect of supplemental molybdenum on estrus activity, reproduction, molybdenum / copper enzyme activity and tissue minerals in the sd rat. 1039997 ORDER NO: AAD89-00934
- Diss** the effect of the anticarcinogenic drug 6-mercaptopurine on mineral metabolism. 0983591 ORDER NO: AAD87-29922
- No COC** effect of tylosin on the growth of early weaned pigs.
- Diss** effect of zinc deficiency on cadmium-induced immunopathology. 01271084 ORDER NO: AADMM-68281
- Diss** the effect of zinc deficiency on platelet aggregation and platelet arachidonate metabolism. 794736 ORDER NO: AAD82-26178
- Diss** the effect of zinc deficiency on the growth promoting actions of growth hormone and insulin-like growth factor-i. 01464918 ORDER NO: AADAA-IMM00009
- Diss** the effect of zinc nutriture on prostaglandin synthesis and fatty acid composition in rat testes. 842169 ORDER NO: AAD84-09575
- Diss** effect of zinc on immune function in young swine and on models of susceptibility to serpulina hyodysenteriae infection. 01395106 ORDER NO: AAD95-03560
- Diss** effect of zinc on protein-energy malnutrition. 807129 ORDER NO: AAD83-07732

- Diss** the effects of a marginal deficiency of zinc in utero on growth and immune development in the mouse: a possible model for normal term low birth-weight infants. 01126264 ORDER NO: AAD13-40379
- Diss** effects of a running stress on vitamin a status in the rat (retinol-binding protein, liver, zinc, electron microscopy). 889513 ORDER NO: AAD85-13334
- Unrel** 1978. effects of alcohol and zinc deficiency on two rat zincaustralia. *Proceedings of the Nutrition Society of Australia* 3: 62.
- Diss** effects of alteration of the dietary amino acid balance on brain neurotransmitter concentrations and patterns of growth and food intake in the chick. 1059965 ORDER NO: AADD--85037
- Diss** effects of amphetamine on isolation-induced aggression original title: efectos de la anfetamina sobre la agresion inducida por aislamiento. 01154243 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.
- Diss** effects of developmental zinc deprivation on bone noncollagenous proteins and bone alkaline phosphatase activity in rat pups. 1025324 ORDER NO: AAD88-11897
- Diss** effects of di-(2 ethylhexyl)phthalate and mono-ethylhexyl phthalate on male rodent gonad. 841324 ORDER NO: AAD84-07834
- Diss** the effects of dietary copper, iron, and zinc on the toxicity of lead in male rats. 549786 ORDER NO: AAD76-02555
- Diss** effects of dietary fat levels and fat sources on growth and trace mineral deposition in young male rats. 1022036 ORDER NO: AAD88-16364
- Diss** effects of dietary zinc deficiency and malnutrition on the t-lymphocyte zinc-finger protein p56(lck) in mice. 01616250 ORDER NO: AADMQ-23380
- Diss** effects of dietary zinc manipulation on insulin action in type 2 diabetes mellitus: a study in the db/db mouse. 01675208 ORDER NO: AADMQ-32249
- Diss** the effects of edta chelation therapy on plaque calcium and mineral metabolism in atherosclerotic rabbits. 696421 ORDER NO: AAD80-21923
- Rev** 1979. effects of feeding dihomo-gamma-linolenic acid (20:3 omega 6) in man. *Nutrition Reviews* 37 (9): 286-288.
- Diss** the effects of heavy metal pollution on woodland leaf litter faunal communities. 1021498 ORDER NO: AADDX-82816
- Diss** effects of iron and zinc supplements on bioavailability of iron, copper, and zinc in young rats fed high fiber diets. 816480 ORDER NO: AAD83-15632
- Diss** the effects of low-level lead exposure on the development of the preweanling rat. 935989 ORDER NO: AAD86-23785
- Diss** the effects of maternal dietary zinc deficiency on the growth and immunocompetence of suckling a/j mice. 721745 ORDER NO: AAD13-19128
- Diss** effects of olfactory impairment on maternal behavior of female golden hamsters.

- Diss** the effects of postnatal zinc deficiency on spatial learning in rats. 01126547 ORDER NO: AAD13-40717
- Diss** the effects of prenatal and postnatal zinc deficiency on development of long-term memory in the rat. 693987 ORDER NO: AAD80-20378
- Nut def** effects of prenatal nutrition on learning and motivation in rats. | .
- Diss** the effects of radiation pasteurization on biochemical and mineral parameters in the blood and livers of weanling rats fed soy, meat and soy-meat combination diets (food irradiation). 01628491 ORDER NO: AAD98-20665
- Diss** effects of subacute magnesium deficiency and soy protein isolate on growth and reproduction in rats. 806683 ORDER NO: AAD83-06789
- Diss** effects of the antituberculous drug ethambutol on zinc balance, distribution, and turnover: short-term studies modeling chronic toxicity. 0958957 ORDER NO: AAD87-08971
- Diss** effects of varying dietary zinc intake of mouse pups during recovery from early undernutrition . 942079 ORDER NO: AAD87-01702
- Diss** the effects of zinc and copper supplementation on blood lipids and trace minerals deposition of young male rats fed either coconut oil or corn oil. 816484 ORDER NO: AAD83-15653
- Diss** the effects of zinc and copper supplementation on growth, lipid profiles, and trace mineral status in young male rats (sprague dawley rats, liver status). 905248 ORDER NO: AAD85-29421
- Diss** effects of zinc and vitamin b-6 supplementation on growth and mineral deposition of young rats fed various levels of protein. 851859 ORDER NO: AAD84-17904
- Diss** the effects of zinc deficiency on bone metabolism in the rat. 699595 ORDER NO: AAD80-25491
- Diss** effects of zinc depletion and repletion during lactation on rat dams and their offspring. 914874 ORDER NO: AAD86-08485
- Diss** effects of zinc on cellular immunity, melanoma growth and metastasis in mice. 797024 ORDER NO: AAD82-27880
- Diss** the effects of zinc on skeletal alkaline phosphatase activity and skeletal tissues. 01520491 ORDER NO: AAD96-39093
- Diss** effects of zinc phosphide treatments on hawaiian sugarcane rat populations (norway, polynesian). 829022 ORDER NO: AAD83-27878
- Diss** the effects of zinc status on hepatic poly(adp-ribose) polymerase function in response to dna damage. 01624917 ORDER NO: AADMQ-24472
- Diss** enhancement of site specific anaerobic reductive dechlorination of polychlorinated biphenyls (biodegradation) . 01673607 ORDER NO: AAD99-09398
- Mix** enhancing zinc serum and tissue levels. S. African : 18 pp.
- Abstract** 1973. environmental and livestock production (continued); international agriculture; meat science and muscle biology; non-ruminant nutrition; physiology. *Journal of Animal Science* 37: 227-

364.

- Diss** an epidemiologic study of cellulitis in broiler chickens in southern ontario (escherichia coli). 01499713 ORDER NO: AADNN-08581
- Diss** the epidemiology of toxascariasis and baylisascariasis in wild carnivores in captivity. UMI Dissertation
- Diss** erythroid development and gata-1. 01420833 ORDER NO: AADAA-IC423078
- Diss** etiology and physiology of chemical-induced tibial dyschondroplasia in broiler chickens|. 01124219 ORDER NO: AAD90-27533
- Diss** experimental copper deficiency in the golden hamster and in healthy adult. 800202 ORDER NO: AAD83-01960
- Diss** experimental copper deficiency in the golden hamster and in healthy adult men. 800202 ORDER NO: AAD83-01960
- Diss** an experimental study of alcoholism in rats: modification in the metabolism of zinc and its relation with the morphological lesions in liver and testes original title: estudio experimental del alcoholismo en ratas: alteraciones del metabolismo del zinc y su relacion con las lesiones en el higado y los testiculos. 1042323 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.
- Diss** expression of mammalian metallothionein genes in escherichia coli and in saccharomyces cerevisiae (metal-resistance). 0962006 ORDER NO: AAD87-18017
- Diss** factors affecting zinc retention in the rat. 0972319 ORDER NO: AAD87-27419
- Diss** fluoride, dentin apposition and dental caries in the rat (streptococcus sobrinus). 01496496 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.
- FL** 1983. forced moulting in layers. <document title>rapport d'activite 1981. <Corporate Author> Belgium, Government Agricultural Research Centre, Ghent : 158-159.
- Diss** gastrointestinal response to copper excess: studies on copper (and zinc). 01256055 ORDER NO: AADDX-97342
- Diss** genomic organization and expression of murine zinc finger genes. 01424221 ORDER NO: AADAA-I9523248
- Diss** a guinea pig model for low-level lead toxicity during gestation (glutamine synthetase). 01184354 ORDER NO: AAD91-34030
- Diss** habitat affinity, populations, and control of black-tailed prairie dogs on the charles m. russell national wildlife refuge (montana). 812685 ORDER NO: AAD83-13100
- Diss** half site, spacing and orientation: the dna binding specificity of nuclear receptors with zinc-fingers (retinoid). 01474818 ORDER NO: AADAA-I9611474
- Unrel** 1977. handling calving difficulties. Rural Research (97): 21-24.
- Diss** hyaline cartilage and secondary bone matrix changes at zinc deficiency original title: modificaciones producidas por la deficiencia de zinc en los componentes de la matriz del cartilago

hialino y del tejido oseo. 1042419 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.

- Diss** hyperzincuria. 01424898 ORDER NO: AADAA-I9524703|
- Diss** identification and characterization of krk-1, a novel kidney specific krab-domain containing zinc finger protein (transcription factor). 01598926 ORDER NO: AAD98-00873
- Diss** an impairment in metabolic availability of vitamin a is associated with the onset of diabetes in bb rats. 01708359 ORDER NO: AADMQ-40081
- Diss** inadequacy of phospholipid in the enterocyte: a primary biochemical defect responsible for impaired vitamin a transport in zinc deficiency. 01414075 ORDER NO: AADAA-I9517446
- Unrel** 1979. increased dental caries in young rats suckled by zinc-deficient dams. *Nutrition Reviews* 37 (7): 232-233.
- Diss** influence of chemical and environmental stresses on metal-binding proteins: species-dependent effects. 1035265 ORDER NO: AAD88-20526
- Diss** the influence of dietary trace metals upon the enzymatic, neurochemical, and neuropathological expression of aluminum neurotoxicity. 750288 ORDER NO: AAD81-15393
- Diss** the influence of dietary zinc and genetic factors on drug-induced malformations in rats and mice. 771822 ORDER NO: AAD82-05005
- Diss** the influence of environmental, nutritional, and management factors on feathering and incidence of dermatitis of broiler chickens. 699794 ORDER NO: AAD80-26067
- Diss** influence of faba bean diets with different levels of zinc on nutritional status and immune response in mice original title: influencia de la ingestion de dietas de vicia faba l. con diferentes niveles de zinc sobre el estado nutritivo y la respuesta inmune de raton. 01140851 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.
- CP** influence of inhibitors of protein synthesis on zinc metabolism.| au-n.j. 08903, usa. *Proceedings of the Society for Experimental Biology and Medicine*|
- Diss** influence of zinc on the teratogenic and mutagenic potential of ethanol in mice. 693320 ORDER NO: AAD80-18989
- Diss** influences of nutrition on immunity and resistance to murine viral hepatitis. 847132 ORDER NO: AAD84-14279
- Diss** inhibited feathering, k(i) a sex-linked dominant gene in the turkey (meleagris gallopavo), genetics and nutrition. 01492594 ORDER NO: AADAA-I9623309
- No COC** initial submission: reproductive and developmental toxicity screen of zinc o,o' di-2-ethylhexyl dithiophosphate in rats with cover letter dated 042094. EPA/OTS; Doc #88-940000235
- Diss** insulin as a regulator of protein-induced hypercalciuria. 1045886 ORDER NO: AAD89-05372
- Diss** insulin-induced muscle membrane changes in a rat model for hypokalemic periodic paralysis (inward rectifying, potassium channel, disease). 902588 ORDER NO: AAD85-29889
- Not Avail** intake of zinc sulphate in drinking water by grazing beef cattle.|.

- Diss** the interaction of dietary protein and zinc deficiencies with heligmosomoides polygyrus infection in mice. 01464914 ORDER NO: AADAA-IMM00005
- Diss** interaction of phytic acid and zinc affecting copper bioavailability in rats. 917260 ORDER NO: AAD86-07921
- Diss** interactions among silicon, copper, zinc, iron and ascorbic acid in the rat. 01482245 ORDER NO: AADAA-19613050
- Diss** interactions among zinc, copper, iron, manganese, and ascorbic acid in the japanese quail (dietary supplements, toxicity, perosis, trace elements, anemia). 887582 ORDER NO: AAD85-14498
- Diss** interactions of cadmium and zinc during pregnancy. 1046169 ORDER NO: AAD89-06090
- CP** interactions of cadmium, copper and zinc in animals chronically to low levels of dietary cadmium. .| au-. <Document Title>Trace Element Metabolism in Man and Animals - 3
- Rev** 1985. interactions of dietary iron and zinc in the chick. *Nutrition Reviews* 43(4): 121-2.
- Diss** interrelationship of high zinc and high calcium in the maternal diet on the mineral composition of brain and liver in the newborn, weanling and maternal rat. 392237 ORDER NO: AAD71-06354
- Diss** an investigation of growth, copper metabolism, and iron metabolism of rats fed high levels of zinc. 228157 ORDER NO: AAD60-03727
- Diss** investigations of zinc in taste perception, adolescent growth and zinc/fat interrelationships. 785785 ORDER NO: AAD82-17516
- No COC** ionizing-radiation detector. *Brit. UK Pat. Appl.* 4 pp.
- Diss** isolation and characterization of cdnas from mammary mrnas differently expressed in lethal milk mutation mice (zinc deficiency). 01619733 ORDER NO: AAD98-15272
- Diss** 1972.*Journal for Scientific Agricultural Research. Volume 24, Number 88, 1971*
- Diss** kainic acid-induced hyperalgesia as a model for the study of chronic pain (fibromyalgia syndrome). 01619561 ORDER NO: AAD98-15030
- Diss** kinetic studies on thermolysin. 771755 ORDER NO: AAD82-04866
- Diss** a kinetic study of zinc metabolism throughout the life cycle of the mouse. 0978962 ORDER NO: AAD87-29965
- Diss** lead poisoning in swans cygnus olor. 01268158 ORDER NO: AADDX-93538
- Diss** lipid metabolism: interaction effects of dietary pectin, phytate, and calcium with zinc and copper (hdl-cholesterol). 823743 ORDER NO: AAD83-21087
- Diss** mcm2 and mcm3, two homologous proteins with a cell cycle-dependent nuclear localization, are important for ars function in yeast. 01200167 ORDER NO: AAD92-04082
- Diss** mechanisms of the zinc protective effects against carbon-tetrachloride hepatotoxicity. 771333 ORDER NO: AAD82-03738
- Diss** mechanistic and structural studies of mouse adenosine deaminase (charge stabilization, enzyme

- kinetics). 01572263 ORDER NO: AAD97-27606
- IMM** 1985. megadose zinc intakes impair immune-responses. *Nutrition Reviews* 43(5): 141-143.
- Diss** the metabolism of metallothionein in perinatal rat liver. 1070528 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.
- Nut def** metal propionates for use as animal feed supplements. U.S. 6 pp. Cont.-in-part of U.S. Ser. No. 315,557, abandoned. CODEN: USXXAM.
- No COC** 1985. metallothionein induction by ethanol. *Nutrition Reviews*. 43(3): 92-94.
- Diss** metallothionein, zinc, and androgen interactions in the rat prostate gland. 0976025 ORDER NO: AAD87-29437
- Diss** mineral bioutilization as affected by sugars. 939551 ORDER NO: AAD86-29533
- Not Avail** mineral metabolism in relation to resistance of the body (ca, na and status in horses, calves and piglets).
- Diss** mineral metabolism of rats and humans fed inorganic tin (zinc). 838455 ORDER NO: AAD84-00491
- Nut** 1987. mobilization of tissue zinc for growth and reproduction. *Nutrition Reviews* 45(11): 346-8.
- Diss** moessbauer diffraction studies of anisotropic crystals. 1001580 ORDER NO: AAD81-23712
- Diss** molecular and genetic studies of ciliary neurotrophic factor (cntf, pzf). 01610526 ORDER NO: AAD98-09802
- Diss** molecular studies of the phenylalanine-inhibited isozyme of 3-deoxy-d-arabino-heptulosonate 7-phosphate synthase from escherichia coli (dahps(phe)).
- Diss** molybdenum requirement of rats (trace elements). 01160188 ORDER NO: AAD91-15361
- Diss** murine immune responses to herpes simplex virus-1 in relation to nutrition. 01146869 ORDER NO: AAD91-06593
- Diss** murine model. 865959 ORDER NO: AAD84-28042|
- Diss** mutations within the ery1 transcriptional unit are associated with juvenile lethality, neuromuscular tremors and germ cell defects in jdf2 mutant mice and pigmentation abnormalities in p(x) and p(m) alleles. 01695772 ORDER NO: AAD99-23343
- No Oral** nasally administrable compositions. *Eur. Pat. Appl.* 29 pp.
- Diss** neuronal plasticity in the hippocampal formation after selective hippocampal cell destruction (sympathetic ingrowth). 839838 ORDER NO: AAD84-07825
- Diss** nmr structural studies of the lim domain only proteins: cysteine rich protein and cysteine rich intestinal protein|. 01454820 ORDER NO: AADAA-I9544012
- Reg** 1972.Non-Ferrous Metals Industry. Accomplishment Plan. Broad Objectives

- Diss** nutrient availability modulating physiology and pathogenicity of legionella pneumophila (iron limitation, zinc metalloprotease, ph dependence). 01626190 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.
- Diss** nutrient interactions of lead and distribution, mobilization and adverse effects of prolonged maternal lead stores. 1040850 ORDER NO: AAD89-03553
- Nut** 1980. nutrition classics. the american journal of physiology. volume 107, 1934, pages 146-156. "zinc in the nutrition of the rat" by w.r. todd, c.a. elvehjem and e.b. hart. *Nutrition Reviews* 38(4): 151-4.
- Acu** nutritional supplementation for zinc and methionine by ingesting 1:1 zinc methionine complexes . U.S. 5 pp. Cont.-in-part 3,941,818..
- Diss** the occurrence and toxicology of heavy metals in chesapeake bay waterfowl (duck, clangula, melanitta, hyemalis, deglandi, anas, platyrhynchos, rubripes, strepera, maryland, virginia) . 856378 ORDER NO: AAD83-12307
- Diss** of young male rats fed adequate and excess protein. 01090702 ORDER NO: AAD90-05827|
- Diss** olfactory and photoperiodic mediation of reproduction in the rat (rattus norvegicus). 846785 ORDER NO: AAD84-13535
- Diss** on the morphology of grain boundary segregation: effect of grain boundary structure in aluminum-zinc alloys.
- Diss** oral dimercaptosuccinic acid and ongoing exposure to lead (chelation)|+. 01391103 ORDER NO: AAD95-02198
- Diss** the parameters that influence reproductive success in congenic strains of house mice. 1045268 ORDER NO: AAD89-00907
- Diss** the pathogenesis of chemically induced pancreatic injury pancreatic injury . 01292096 ORDER NO: AAD93-14086
- Diss** performance of broilers and layers fed crab meal and other substances for improving utilization of diets containing whey or cellulose. 929314 ORDER NO: AAD86-19225
- Diss** perinatal and postweaning effects of the interaction between maternal ethanol ingestion and low dietary zinc in the rat (caries). 844602 ORDER NO: AAD84-11475
- No Oral** pharmaceutical preparation containing vitamin b6. *Eur. Pat. Appl.* 13 pp..
- OAC** pharmaceuticals containing zinc salts and zinc chelates for the prevention of tissue damage caused by free radicals. *Eur. Pat. Appl.* 46 pp.
- Diss** physiological effects of chitosan and chitorich(tm) on rats fed at two levels of lipid and fiber. 01617028 ORDER NO: AAD13-87791
- Diss** phytate, phytase, germination and zinc bioavailability from peas (processing, electron microscopy). 904918 ORDER NO: AAD85-27116
- Diss** post-translational modifications and expression stability of gpi-anchored and secreted forms of a recombinant metalloproteinase (glycosylphosphatidylinositol). 01631287 ORDER NO: AADNQ-25122

- Diss** poultry offal as a source of energy and protein in growing-finishing swine diets (lactobacillus acidophilus, silage, viscera, zinc-65). 911526 ORDER NO: AAD86-06096
- Rev** 1983. poultry research centre report for the year ended 31st march 1982. UK, *Agricultural Research Council* : xviii + 116pp.
- Unrel** preparation of a fruit nutrient "zengguosu" which can increase fruit production. *Faming Zhuanli Shenqing Gongkai Shuomingshu* : 4 pp.
- No Org** preparation of biologic inorganic composite feed additive for animals and fowls. *Faming Zhuanli Shenqing Gongkai Shuomingshu* : 48 pp.
- Diss** prevention of cadmium induced immunopathology by zinc in mice. 1057441 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.
- Diss** prevention of silica urolithiasis (urolithiasis, sheep). 01223456 ORDER NO: AAD92-18298
- Unrel** protein-based thermoplastic chewable pet toy. *PCT Int. Appl.* 30 pp.
- Diss** proton transfer in catalysis by the carbonic anhydrases. 01690720 ORDER NO: AAD99-19557
- Diss** purification and characterization of pit viper venom components (e toxin, hemorrhagin, crotoamine, neurotoxin, rattlesnake). 926840 ORDER NO: AAD86-18067
- Diss** purification and properties of rat intestinal peptidyl dipeptidase a. 01159591 ORDER NO: AADDX-92140
- HHE** purification, inhibition and mechanistic studies of clostridium histolyticum and human neutrophil collagenases. 929270 ORDER NO: AAD86-19145
- Diss** rapid effects of dietary zinc on the epithelium of the small intestine in zinc deficient rats. 01557715 ORDER NO: AADMM-14384
- Diss** the rapid effects of dietary zinc on the structure and function of the lower gastrointestinal tract of the rat. 01512429 ORDER NO: AADMM-09652
- Diss** reactive synaptogenesis in the dentate gyrus following entorhinal cortex/fimbria fornix transections in adult rats (entorhinal cortex, fimbria fornix). 01408267 ORDER NO: AADAA-I0575709
- Nut def** 1979. reduction in hepatic phospholipid and protein-levels by zinc supplementation in rats given ethanol and a choline-deficient diet. *Pharmacologist* 21: 262.
- Diss** regulation of hepatic glutaminase. 1064628 ORDER NO: AAD89-15087
- Diss** relationship between the concentration of intracellular divalent cations and excitotoxicity (calcium, magnesium, zinc, glutamate). 01704096 ORDER NO: AAD99-28074
- Diss** relative bioavailability of different organic and inorganic zinc and copper sources in ruminants and rats (lysine, methionine). 01469980 ORDER NO: AADAA-I9606713
- FL** 1984. *Report on the Project Research 'Exposure to Environmental Radiation Due to Nuclear Facilities'. Fiscal 1978-1982.* NIRS-M-49
- Diss** reversible chelation of bouton zinc: effects on hippocampal function measured behaviorally.

1012779 ORDER NO: AAD88-11752

- Diss** the role of mouse adenosine deaminase in purine metabolism: physiological and mechanistic aspects. 01409906 ORDER NO: AADAA-I9514209
- Diss** the role of the main and vomeronasal olfactory systems in the mediation of individual recognition in spiny mice. 922167 ORDER NO: AAD86-16364
- Diss** role of the vomeronasal organ in murine priming and signalling chemocommunication systems. 738309 ORDER NO: AAD81-03936
- Diss** scientific basis for the use of cyanobacteria in bioremediation (synechococcus, heavy metals). 01463365 ORDER NO: AADAA-I9606027
- Diss** the search for a model to define the physiological interaction of zinc and epidermal growth factor in the rat esophagus. 01557776 ORDER NO: AADMM-14458
- Unrel** *SEM and Microprobe Analysis of Bone Response to Zinc-Amalgam Implants.* <NOTE> Rept. for Sep 75-Aug 77| AU- Liggett, W. R. ; Brady, J. M. ; Customers); (703)605-6000 (Other Countries); Fax at (703)321-8547; and Email at Orders@Ntis.Fedworld.Gov. NTIS Is Located at 5285 Port Royal Road, Springfield, VA, 22161, USA.
- Diss** the sensory regulation of maternal aggression in lactating norway rats (rattus norvegicus). 01408840 ORDER NO: AADAA-I9511978
- Diss** sequential changes in the buccal mucosa of zinc-deficient rats (mucosa).
- Diss** skeletal development and performance of broilers. 1080439 ORDER NO: AAD89-24144
- Diss** smooth muscle cells. 01456214 ORDER NO: AADAA-I9601699|
- Diss** solation and partial characterization of fetal hepatic metallothionein and its role during cadmium exposure in late pregnancy. 754864 ORDER NO: AAD81-18418
- Diss** some effects of excess dietary zinc on iron-porphyrin compounds in the rat. 099850 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.
- Diss** specificity of transcriptional control in drosophila development (homeodomain). 01212813 ORDER NO: AAD92-10011
- Diss** the structural and functional studies of the major nucleocapsid protein of rous sarcoma virus|. 1039675 ORDER NO: AAD88-20763
- Diss** structural determinants of catalysis and steroid binding in 3-alpha-hydroxysteroid dehydrogenase. 01572088 ORDER NO: AAD97-27294
- FL** 1976. structural studies on des-pentapeptide (b26-30)-insulin. i. the preparation and properties of des-pentapeptide-insulin. *Scientia Sinica* 19(3): 351-7.
- Diss** structure and function of the chicken gata-1 transcription factor (zinc fingers, dna binding protein)]. 01470606 ORDER NO: AADAA-I9607650
- Diss** studies of age-related testicular and reproductive endocrine toxicity of di-n-butyl phthalate in rats (testicular atrophy). 01164692 ORDER NO: AAD91-19954

- Diss** studies of select trace element nutrition upon cardiac electrical, morphometrical and ultrastructural aspects of the rat and pig. 01377915 ORDER NO: AAD94-27827
- Diss** studies of specific ions on chromatin and dna structures (cations). 01351262 ORDER NO: AAD94-11479
- Diss** studies of the effects of a range of dietary intakes of corn and olive oils and butter upon metabolic responses to endotoxin, in the wistar rat. 01496091 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.
- Diss** studies of the mechanisms of zinc uptake and homeostasis in rat intestine. 804855 ORDER NO: AAD83-05763
- Diss** studies on intestinal copper and zinc absorption in the rat (perfusion system, basolateral membrane, metallothionein). 882096 ORDER NO: AAD85-10822
- Diss** studies on the action of pectin and guar gum in growth depression of chicks. 766383 ORDER NO: AAD81-29959
- Abstract** studies on the importance of zinc for fetal development in swine.| au-. (2p.): 32A.
- Diss** studies on the regulation of the bcl-6 proto-oncogene during embryonal development and lymphoid functions. 01678187 ORDER NO: AAD99-10687
- Nut def** 1984.Studies Show Zinc Deficiency Retards Brain Development In Rats. <NOTE> NTIS Tech Note
- Diss** study of cis-acting elements and trans-acting factors involved in the differential expression of chicken u4 snrna genes (proximal palindrome binding factor). 01482688 ORDER NO: AADAA-I9613833
- Diss** a study of the human x-linked inhibitory apoptosis protein xiap and its murine homologue miap-3. 01672988 ORDER NO: AADNQ-32444
- Diss** a study of zinc concentration in hair as an indication of zinc imbalances. 755383 ORDER NO: AAD81-19631
- Diss** sugar alcohols and mineral metabolism: an experimental study of the effect of dietary sugar alcohols on the mineral, electrolyte and acid-base balance of the rat (polyol, xylitol, sorbitol). 1032557 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.
- Diss** synthesis, antineoplastic activity and mode of action of novel styryl ketones. 801525 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.
- Diss** taste dysfunction in zinc-depleted rats. 0956399 ORDER NO: AAD87-12455
- Diss** teratogenic effect of calcium edetate (ca-edta) in rats and the protective effect of zinc. 768251 ORDER NO: AAD81-29606
- Diss** test sequencing as an effective approach to isolate cdnas coding for proteins putatively involved in myocardial development. 01505742 ORDER NO: AADMM-07551
- Nut** therapeutic diet for dogs with lymphoma. PCT Int. Appl. 25 pp..
- Diss** therapeutic management of avian lead intoxication (columba livia). 01400165 ORDER NO:

AAD95-05799

- Diss** tithiobiuret toxicity in the rat (delayed onset muscle weakness, antagonium, chelating agents, refractoriness, neurotoxicity). 904749 ORDER NO: AAD85-22544
- Diss** toxic interactions among lead, zinc and cadmium with varying levels of dietary calcium and vitamin d in rats. 530477 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.
- Diss** toxicity of cadmium in pregnant rats fed a zinc-deficient diet. 512425 ORDER NO: AAD74-26758
- Diss** toxicity of cadmium to the developing lung. 775918 ORDER NO: AAD82-01418
- No Oral** 1977. toxicity of l-mimosine and its chelate forming nature with metalkumamoto, japan. *Kumamoto Medical Journal* 30(3): 101-110.
- Diss** trace element profile of b-16 murine melanoma by particle-induced x-ray emission analysis. 752168 ORDER NO: AAD81-15696
- Rev** 1973. tracing and treating mineral disorders in dairy cattle. (Book): 61pp.
- Diss** transcriptional repression and activation mediated by a new hela nuclear phosphoprotein p21/siir (oncogene). 01487561 ORDER NO: AADAA-I9618604
- Drug** treatment of ocular disease by modulation of matrix metalloproteinases and their inhibitor. *PCT Int. Appl.* 19 pp..
- Rev** tsca section 8(e) report- zinc dialkyldithiophosphates with attachment. EPA/OTS; Doc #88-8100379
- Diss** ultrastructural and functional effects of lead poisoning on adult canine myocardium: assessment of thiamin treatment (papillary muscle, zinc protoporphyrin, thiamin pyrophosphate, alad). 905404 ORDER NO: AAD86-00036
- Diss** an ultrastructural study of enameloid matrix formation and mineralization in a teleost, cichlasoma cyanoguttatum, using selected experimental systems (odontogenesis, development, ameloblast). 836225 ORDER NO: AAD84-04689
- Diss** ultrastructure of keratinizing mucosa of rats fed a zinc-low diet. 334730 ORDER NO: AAD68-16717
- Diss** uptake of stable isotopes as a method of labeling hair (copper, iron, zinc). 950219 ORDER NO: AAD87-08664
- Drug** use of a texaphyrin in photodynamic therapy of melanoma and other pigment-related lesions. *PCT Int. Appl.* 56 pp.
- Not Avail** use of .alpha.-mercapto-.beta.-arylacrylic acids for increasing the zinc content in serum and tissues. *Ger. Offen.* 17 pp.
- Unrel** 1982. *Use of Isotopes to Detect Moderate Mineral Imbalances in Farm Animals. Results of a CO-Ordinated Research Programme on the Use of Isotope Techniques for Detection of Moderate Mineral Imbalances in Farm Animals Organized by the Joint FAO/IAEA Division of Isotope and Radiation Applications of Atomic Energy for Food and Agricultural Development and Presented*

at a Research CO-Ordination Meeting Held in Nicosia, Cyprus, 6-10 October 1980. IAEA-TECDOC-267; CONF-8010327-

- Diss** vascular, nutritional and systemic aspects of zinc physiology: interactions with prostaglandins, essential fatty acids and the pineal. 692894 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.
- Unrel** veterinary treatment of animals having demodectic mange. U.S. 3 pp..
- Nut def** vitamin a metabolism during the repletion of zinc deficient rats. au-.
- Drug** wound healing composition containing vitamin c, a zinc salt and a sulfur amino acid. U.S. 10 pp. Cont.-in-part of U.S. Ser. No. 619,004, abandoned..
- Nut def** zinc - an essential element for hair growth. au-. <Document Title>Trace Element Metabolism in Man and Animals - 3.|
- Rev** 1983. zinc and benign postnatal seizures. *Nutrition Reviews* 41(7): 211-213.
- Unrel** 1986. zinc and fetal alcohol syndrome - another dimension. *Nutrition Reviews* 44(11): 359-360.
- Diss** zinc and prostaglandin interrelationship in metabolism. 758093 ORDER NO: AAD81-22541
- Nut def** 1969. zinc and reproduction. *Nutrition Reviews* 27(1): 16-8.
- HHE** zinc bioavailability from legumes in non-human primates (macaca fascicularis). 882142 ORDER NO: AAD85-10881
- Drug** zinc complex of polyether antibiotic and its use. *Ger. Offen.* 83 pp..
- Rev** 1978. zinc deficiency and bone metabolism in rats. *Nutrition Reviews* 36(5): 152-3.
- Diss** zinc deficiency changes oral fine structure and permeability to carbon-14 molecules of rabbit periodontium. 759745 ORDER NO: AAD81-21687
- Diss** zinc deficiency: effect on insulin metabolism and hepatic insulin binding in pregnant rats and fetuses| original title: deficiencia nutricional de zinc. efecto sobre la insulina y su interaccion con el receptor hepatico en ratas gestantes y en sus fetos. 01140996 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.
- Nut def** 1976. zinc deficiency in pregnant, fetal and young rats. *Nutrition Reviews* 34(3): 84-6.
- Diss** zinc deficiency in the pregnant rat affects maternal and fetal metabolism of polyunsaturated fatty acids. 01408183 ORDER NO: AADAA-INN92825
- Nut def** 1984. zinc-deficiency retards brain-development in rats. *Journal Of The American Dietetic Association* 84(4): 457.
- Prim** 1985. zinc deprivation of pregnant monkeys. *Nutrition Reviews* 43(11): 353-6.
- In Vit** 1969. zinc in relation to dna and rna synthesis in regenerating rat liver. *Nutrition Reviews* 27(7): 211-3.
- Diss** zinc in soybeans. chemical nature and bioavailability. 0996067 ORDER NO: AAD88-14495

- Abstract** 1975. zinc in the drinking water. *New Zealand Agriculturist* 21(1): 5.
- FL** zinc kinetics and metabolism in rats fed diets with or without phytic acid. <. *Document Title>Trace Element Metabolism in Man and Animals* - 3.
- FL** zinc metabolism in pigs. xiii. effect of biotin on the development of zinc deficiency. <. *Document Title>Arsberetning 1977. Institut For animals; Sus Scrofa; Ungulates*
- Diss** zinc-methionine and avian cellular immunity (turkey). 01418639 ORDER NO: AADAA-I9518343
- HHE** [zinc oxide-eugenol as dental material (1)]. <original> zinkoxid-eugenol als zahnarztlicher werkstoff (teil 1)| au- than other dental materials. as they alleviate pain and are bacteriostatic and antiseptic, they are well tolerated by patients. the cements are good insulators and possess better sealing properties than zinc phosphate cements. because of their poor mechanic properties, the conventional zinc oxide-eugenol cements are mainly used as temporary fixing contents and filling materials, for gingival dressings and together with filling materials as impression materials. recently, reinforced zinc oxide-eugenol cements and cements containing ethoxy benzoic acid (eba) have been developed. these new cements have considerably better mechanic properties and are therefore used for cement bases, indirect capping, long-term temporary fillings and in selected cases as definite fixing cements.
- HHE** Aamodt, R. L., Rumble, W. F., and Henkin, R. I. 1983. zinc-absorption in humans - effects of age, sex, and food. *Acs Symposium Series* 210: 61-82.
- FL** Abashidze, U. E. and Volkov, D. T. 1974. effect of various ration levels of zinc and magnesium on calcium-dependent atpase activity in hen liver. *Byull. Vses. Nauchno-Issled. Inst. Fiziol. Biokhim. Pitan. S-Kh. Zhivotn.* 8(2): 32-4.
- FL** Abashidze, U. E. and Volkov, D. T. 1977. effect of zinc and magnesium in the ration on the activity of some metal enzymes in tissues, on the productivity of chicks, and on production quality. *Tr. Vses. Nauchno-Issled. Inst. Fiziol. Biokhim. Pitan. S-Kh. Zhivotn.* 17: 93-103.
- CP** Abawi, F. G. and Sullivan, T. W. vitamin trace mineral and antibiotic supplementation of turkey diets. *71ST ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC. POULT SCI.* 61 (7). 1982. 1403.
- No COC** Abbott, W. W. and Couch, J. R. the effects of zinc bacitracin upon broiler performance under normal conditions and during severe outbreaks of avian encephalo myelitis. *POULTRY SCI.* 49 (5). 1970 1362-1363
- Food** Abd-El-Kader, M. M., Mekkawy, A. A., and Hegazi, S. M. National Research Centre Cairo Egypt. 1991. effect of dietary phytate and fibre on availability of iron, zinc and calcium of some common foods consumed in egypt. *Egyptian Journal of Food Science.* V. 19(3) P. 279-291
- No Dose** Abdel Aziz, M. T., Khalil, A. M., El Harrizi, W. M., and Abdel Aziz, A. 1986. zinc, a prophylactic measure against bilharziasis. *Nutr. Rep. Int.* 34(2): 255-61 .
- BioX** Abdel Aziz, M. T., Tawadrous, G. A., El Harrizi, W. M., Atta, H. M., El Raziky, E., Khalil, A. M., and Darwish, A. H. effect of different levels of excess dietary zinc on bilharzial hepatic fibrosis. *Nutr. Rep. Int.* (1988) 37(2): 319-34 .
- Mix** Abdel Fadil, Honsny and Abdel Magid, Sayedat. prophylactic role of dietary zinc against cadmium toxicity in broiler chicks with special reference to cumulative effect of cadmium on the level of some elements in various tissues. *Zagazig J. Pharm. Sci.* (1996) 5(2): 92-98 .

- FL** Abdel-Hakim, N. F. Azhar Univ. Cairo Egypt Faculty of Agriculture, Amer, A. A., Attia, F. M., Aly, M. M. M., and Omera, M. I. 1985. performance of growing chicks as affected by zinc level in the diet egypt. *Al-Azhar Journal of Agricultural Research*. V. 4 P. 217-230
- Nut def** Abdel-Mageed, Asim B. and Oehme, Frederick W. the effect of various dietary zinc concentrations on the biological interactions of zinc, copper, and iron in rats. *Biol. Trace Elem. Res.* (1991) 29(3): 239-56 .
- FL** Abdel Samee, A. M. Suez Canal University El Arish Egypte Environmental Agricultural Sciences College Animal Production Department. 1995. using some antibiotics and probiotics for alleviating heat stress on growing and doe rabbits in egypt [avoparcin, flavomycin, zinc-bacitracin; bospro (bs), lacto-sacc (ls)]. <original> utilisation de quelques antibiotiques et probiotiques afin d'eviter le stress du a la chaleur des lapines et des lapins en croissance en egypte [avoparcin, flavomycin, zinc-bacitracin; bospro (bs), lacto-sacc (ls)]. *World Rabbit Sciences*. V. 3(3) P. 107-111
- CP** Abdelsamei, A. H., Keshavarz, K., and McCormick, C. C. effect of energy restriction and supplemental dietary zinc on production performance of 33-week old single combe white leghorn hens. *74TH ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC. POULT SCI.* 64 (Suppl. 1). 1985. 51.
- No Dose** Abdulla, M., Svensson, S., Haeger-Aronsen, B., Mathur, A., and Wallenius, K. effect of age and diet on delta-aminolevulinic acid dehydratase in red blood cells. *Enzyme* (1978) 23(3): 170-5 .
- CP** Abdulla, M., Svensson, S., Mathur, A., and Wallenius, K. 1978. effect of age and diet on delta-aminolevulinic acid dehydratase - a zinc dependent enzyme. *Trace Elem. Metab. Man Anim. Proc. Int. Symp., 3rd* : Meeting Date 1977, 64-7. Editor(s): Kirchgessner, M. Publisher: Arbeitskreis Tierernaehrungsforschung Weihenstephan Inst. Ernaehrungsphysiol., Freising-Weihenstephan, Ger..
- FL** Abdullaev, D. V., Absalyamov, E. F., and Rish, M. A. 1979. parakeratosis in cattle (role of vitamin a deficiency). *Veterinariya, Moscow, USSR* (5): 55-56.
- Aquatic** Abdullah, A. M. and Ireland, M. P. cadmium content, accumulation and toxicity in dog whelks collected around the welsh coastline. *Mar. Pollut. Bull.* (1986) 17(12): 557-61 .
- Aquatic** Abdullah, A. M. and Ireland, M. P. seasonal studies on cadmium concentration and toxicity, oxygen consumption, digestive gland glycogen, and lipid in dog whelks collected at aberystwyth, wales. *Mar. Pollut. Bull.* (1986) 17(12): 562-6 .
- Aquatic** Abdullah, A. M. and Ireland, M. P. seasonal studies on cadmium concentration and toxicity oxygen consumption digestive gland glycogen and lipid in dog whelks collected at aberystwyth wales uk. *MAR POLLUT BULL. Marine Pollution Bulletin.* 17 (12). 1986 (Recd. 1987). 562-566.
- No COC** Abdulrahim, S. M. 1995. effect of supplementing the feed with zinc bacitracin on broilersperformance. *Dirasat. Series B, Pure and Applied Sciences* 22(4): 69-80.
- No COC** Abdulrahim, S. M., Haddadin, M. S. Y., Odetallah, N. H. M., and Robinson, R. K. 1999. effect of lactobacillus acidophilus and zinc bacitracin as dietary additives for broiler chickens. *British Poultry Science*. 40(1): 91-94.
- No COC** Abdulrahim, S. M(A), Haddadin, M. S. Y(A), Hashlamoun, E. A. R(A), and Robinson, R. K. 1996. the influence of lactobacillus acidophilus and bacitracin on layer performance of chickens

and cholesterol content of plasma and egg yolk. *British Poultry Science* 37(2): 341-346.

- No COC** Abdulrahim Shakib M. 1995. effects of supplementing the feed with zinc bacitracin on broiler performance. *Dirasat Series B Pure and Applied Sciences* 22(4): 1141-1152.
- Nut def** Abe, Hiroki and Tomita, Hiroshi . experimental studies of taste disturbance due to food additives. *Nihon Univ. J. Med.* (1987) 29(1): 25-34 .
- FL** Abe, Kazuo. studies on the effects of zinc compounds on the bone growth in rats . ii. effect of zinc compounds on bone metabolism in weanling rats. *Gifu Daigaku Igakubu Kiyo* (1995) 43(2): 299-305 .
- BioX** Abel de la Cruz, A. J. M., Burguera, J. L., Burguera, M., and Anez, N. 1993. changes in the total content of iron, copper, and zinc in serum, heart, liver, spleen, and skeletal muscle tissues of rats infected with trypanosoma cruzi. *Biological Trace Element Research*. 37(1): 51-81.
- Drug** Abel, E. L. and Reddy, P. P. 1997. prenatal high saturated fat diet modifies behavioral effects of prenatal alcohol exposure in rats. *Alcohol* 14(1): 25-9.
- FL** Abolin'sh, A. F. 1989. effect of different sources of copper and zinc on the concentration of copper in blood and on fertility in lactating cows. *Byulleten' Vsesoyuznogo Nauchno-Issledovatel'Skogo Instituta Fiziologii, Biokhimii i Pitaniya Sel'Skokhozyaistvennykh Zhivotnykh* (1(97)): 45-47.
- Diss** Abou-EL-Fetouh, M. S. 1985. pathological experimental studies on rodenticides (zinc phosphide and endrin) toxicosis in albino rats and rabbits [egypt]. 119 P.
- Not Avail** Abou-Zeid, A. E., Mohamed, F. F., and El-Soud, S. B. A. 1999. impact of vitamin c and/or zinc supplementation on performance and immunity of broilers. *Egyptian Poultry Science Journal* 19(3): 635-655.
- In Vit** Abraham, N. G. and Kappas, A. 1997. metals as regulators of the biological and physiological roles of heme oxygenase. *Trace Elem. Man Anim.--9 Proc. Int. Symp., 9th* : Meeting Date 1996, 372-376. Editor(s): Fischer, Peter W. F. Publisher: National Research Council of Canada, Ottawa, Ont.
- In Vit** Abrahams, I. L., Bremner, I., Diakun, G. P., Garner, C. D., and Hasnain, S. S. structural study of the copper and zinc sites in metallothioneins using extended x-ray absorption fine structure. *Report (1985) DL/SCI/P-489E, HASN-85/470; Order No. PB86-180395/GAR, Avail.: NTIS From: Gov. Rep. Announce. Index*
- No Dose** Abrahams, I. L., Bremner, I., Diakun, G. P., Garner, C. D., and Hasnain, S. S. 1985. *Structural Study of the Copper and Zinc Sites in Metallothioneins Using Extended X-Ray Absorption Fine Structure*. *DL/SCI/P-489E; HASN-85/470*
- Fate** Abrahams, I. L., Bremner, I., Diakun, G. P., Garner, C. D., Hasnain, S. S., Ross, I., and Vasak, M. 1986. structural study of the copper and zinc sites in metallothioneins by using extended x-ray-absorption fine structure. *Biochemical Journal* 236(2): 585-9.
- In Vit** Abrahams, Ian L., Bremner, Ian, Diakun, Gregory P., Garner, C. David, Hasnain, S. Samar, Ross, Ian, and Vasak, Milan. structural study of the copper and zinc sites in metallothioneins by using extended x-ray-absorption fine structure. *Biochem. J.* (1986) 236(2): 585-9 .
- HHE** Abreu, Mario. food use of pollen in relation to human nutrition. *Alimentaria (Madrid)* (1992) : 235, 45-6.

- HHE** Abu-Assal, M. J. and Craig, W. J. 1984. the zinc status of pregnant vegetarian women. *NUTR REP INT. Nutrition Reports International*. 29(2): 485-494.
- Phys** Abu-el-Zahab, H. S., Abdel Aal, W. E., Awadallah, R., Mikhail, T. M., and Zakaria, K. 1991. the correlation between serum total cholesterol and some trace elements in serum, liver and heart of rats fed high cholesterol diet. *Die Nahrung* 35(8): 827-34 .
- Nut** Abu-Serewa, S. and Karunajeewa, H. a comparison of methods for rehabilitating aging hens. *AUST J EXP AGRIC. Australian Journal of Experimental Agriculture*. 25 (2). 1985. 320-325.
- FL** Aceves Lopez, Ana Bertha, Buntinx Dios, Silvia Elena, Aguirre Garcia, Maria Antonieta, Paniagua Vazquez, Jose Luis, and Rosiles Martinez, Rene. 1998. [effect of breed and type of lambing on the concentration of copper and zinc in blood, milk and wool of penned sheep under restricted feeding]. <original> efecto de la raza y el tipo de parto en la concentracion de cobre y cinc en sangre, leche y lana de ovejas en confinamineto bajo restriccion alimenticia. *Veterinaria Mexico*. V. 29(4) P. 313-321
- Rev** Ackerman, L. 1987. nutritional supplements in canine dermatoses. *Canadian Veterinary Journal* 28(1/2): 29-32.
- No Dose** Ackerman, N., Spencer, C. P., Sundlof, S. F., and Partridge, H. L. 1990. zinc toxicosis in a dog secondary to ingestion of pennies. *Veterinary Radiology* 31(3): 155-157.
- No Oral** Ackland, M. Leigh and Mercer, Julian F. B. the murine mutation, lethal milk, results in production of zinc-deficient milk. *J. Nutr.* (1992) 122(6): 1214-18.
- Nut def** Acuff-Smith, K. D., Keen, C. L., Rogers, J. M., and Daston, G. P. induction of metallothionein (mt) mrna in liver and yolk sac of rats after exposure to urethane during mid-gestation. *Teratology* 1994 May;49(5):396
- Nut def** Acuff-Smith, K. D., Rogers, J. M., Keen, C. L., and Daston, G. P. toxicant-induced maternal-embryonic zn deficiency causes excess cell death in rat embryos. *Teratology* 1995 Mar;51(3):171
- No Oral** Adam, A. L(A), Bestwick, C. S., Barna, B., and Mansfield, J. W. 1995. enzymes regulating the accumulation of active oxygen species during the hypersensitive reaction of bean to pseudomonas syringae pv. phaseolicola. *Planta (Heidelberg)* 197(2): 240-249.
- Bio Acc** Adam, J. and Pinta, M. 1986. tibial dyschondroplasia of broilers. syndrome of s-shaped tibias. *Bulletin Mensuel De La Societe Veterinaire Pratique De France* 70(7): 425-428.
- Mix** Adam, S. E. 1999. experimental rhazya stricta toxicosis in rats. *Veterinary and Human Toxicology* 41(1): 5-8.
- Bact** Adami Annunciata and Cavazzoni Valeria(A). 1999. occurrence of selected bacterial groups in the faeces of piglets fed with bacillus coagulans as probiotic. *Journal of Basic Microbiology* 39(1): 3-9.
- Unrel** Adamopoulos, D. A., Kontogeorgos, L., Vassilopoulos, P., Kapolla, N., Stathopoulos, E., and Nicopoulou, S. 1992. effects of induced peripheral anosmia on gonadal maturation in prepubertal male rabbits. *International Journal of Andrology* 15(3): 246-54 .
- In Vit** Adams, D. A., Freauuff, S. J., and Erickson, K. L. plasma membrane isolation and fatty-acid analysis of membrane lipids from murine lymphocytes. *Analytical Biochemistry*. 144 (1). 1985. 228-232.

- CP** <Additional> Aisen, P., Harrison, P. M., Banyard, S. H., Hoare, R. J., Russell, S. M., Treffry, A., Drysdale, J. W., Baum, H., Pollak, J. K., Jacobs, A., Neilands, J. B., Brown, E. B., Ricketts, C., Cavill, I., Ponka, P., Neuwirt, J., Borova, J., Fuchs, O., Youdim, M. B. H., Green, A. R., Woods, H. F., Boullin, D., Callender, S., Chandra, R. K., Au, B., Willson, R. L., Woodford, G., Hyam, P., Hoffbrand, A. V., Konopka, L., Iancu, T. C., Neustein, H. B., Landing, B. H., Peters, T. J., Selden, C., and Seymour, C. A. 1977. iron metabolism. (Book) : viii + 391pp.
- CP** <Additional> Ashiru, O. A., Blake, C. A., Axelson, J. F., Gerall, A., Albers, H. E., Bahr, J., Dial, O. K., Ramaley, J., Batta, S. K., Guthrie, H. D., Pursel, V. G., Basuray, R., Belanger, A., Auclair, C., Caron, S., Berardinelli, J. G., Butcher, R. L., Berman, M. I., Berrios, M., Bedford, J. M., Bill, C. H. II., Greenwald, G. S., Blazak, W. F., Fechheimer, N. S., Bleau, G., Perrault, A., Jean, Y., Bousquet, D., Bradford, M. M., McRorie, R. A., Campbell, C. M., Idler, D. R., Campbell, K. L., Carey, J. E., Olds-Clarke, P., Carlson, J. C., Buhr, M. M., Thompson, J. E., Carr, W. R., Land, R. B., Centola, G. M., Anderson, L. D., Channing, C. P., Stone, S. L., Fowler, S., Edelson, S., Schwartz-Kripner, A., Chappel, S. C., Chen, T. T., Harwood, J. P., Catt, K. J., Ciaccio, L. A., Lisk, R. D., Clegg, E. D., Stringham, R. W., Coquelin, A., Bronson, F. H., Crim, L. W., Cunnane, S. C., Horrobin, D. F., Sella, G. E., Cusan, L., and Pelletier, G. 1979. twelfth annual meeting, august 21-24, 1979, society for the study of reproduction, laval university, quebec, canada. abstracts. *Biology of Reproduction* 20(Supplement 1): 140 pp.
- CP** <Additional> Beyazova, U., Yetgin, S., Yegin, O., Ersoy, F., Berkel, I., Gibbs, J. H., Baum, J. D., David, L., Betend, B., Evrard, A., Francois, R., Exner, G. U., Prader, A., Elsasser, U., Anliker, M., Vainsel, M., Danks, D. M., Camakaris, J., Stevens, B. J., Matthieu, J. M., Langslet, A., Refsum, H., Peltonen, R., Urponen, H., Peltonen, T., Schultz, K., Mestyan, J., Soltesz, G., Soevik, O., Finne, P. H., Turcan, D., Rawlings, G., Stewart, A., Scopes, J. W., Pearse, R. G., Taylor, A., Dumont, G., Hanefeld, F., Rating, D., Schneider, H., Svennerholm, L., Foss, I., Trygstad, O., Reichelt, K., Heird, W. C., Rassin, D., Gaull, G. E., Martinez, M., Ballabriga, A., Sternowsky, H. J., Heigl, K., Timonen, E., Kouvalainen, K., Akerblom, H. K., Principi, N., Giunta, A., Gervasoni, A., and Jonxis, J. H. P. 1977. ninth annual meeting: the european society for pediatric research, fondazione cini - isola di san giorgio, venice, italy, september 7-10, 1977. *Pediatric Research* 11(9, II): 1011-1029.
- CP** <Additional> Bieber, M. A., Bassi, J. A., Brasel, J. A., Heird, W. C., Nelson, M. F., Kwong, E., Barnes, R. H., Smith, B. A., Jansen, G. R., Zamenhof, S., Marthens, E. van, Lo, G. S., Dykstra, M. L., Longenecker, J. B., Ruttenberg, H., Squibb, R. L., Metcalf, J., Costiloe, P., Crosby, W., Sandstead, H., McClain, P., Vobecky, J. S., Vobecky, J., Shapcott, D., Demers, P. P., Louie, S. K., Lewis, J. S., Louie, J. M., Dell, M. F., Bayley, H. S., Atkinson, J. L., Hill, D. C., Maher, R. W., Gass, G. H., Lundgren, D. W., Oka, T., Dutta, P., Fahim, M., Flynn, M., Lederman, S. A., Rosso, P., Portala, M. L., Rio, M. E., Sanahuja, J. C., Fosmire, G. J., Buell, S. J., Sandstead, H. H., Bertrand, H. A., Masoro, E. J., Yu, B. P., Miller, D., Hanson, W., Schedl, H., Osborne, J., Reeves, R. D., Dickinson, L., Lee, J., Kilgore, B., Branham, B., Elders, M. J., Borum, P. R., and Broquist, H. P. 1977. federation of american societies for experimental biology; 61st annual meeting, chicago, illinois april 1 - 8, 1977. nutrition and development. *Federation Proceedings* 36(3): 1108-1109, 1128-1129.
- CP** <Additional> Dreosti, I. E., Manuel, S. J., Fraser, F. J., Buckley, R. A., Record, I. R., Bell, R. R., Spickett, J. T., White, C. L., Reilly, C., Strauss, B. J., Hunt, P. S., Wahlqvist, M. L., Korman, M. G., Brodie, G. N., Setiadi, H., Powles, J., Williams, D. R. R., Roberts, D. C. K., Wolfe, B. M., Giovannetti, P. M., Cheng, D. C. H., Carroll, K. K., Collier, G., O'Dea, K., Nestel, P., Sullivan, D. R., Truswell, A. S., McIntosh, G. H., Illman, R. J., Topping, D. L., Sinclair, A. J., Slattery, W., Fenwick, D. E., Oakenfull, D. G., Billington, T., Wailes, A., Tomas, F. M., Pope, L. M., Duncan, S. J., Jones, G. P., Stewart, A. J., Oliphant, R. C., Simons, L. A., Jones, A. S., Blau, G., Flint, D. M., McInnis, D. L., and Balazs, N. D. 1980. fifth annual conference, melbourne, victoria, november 1980. *Proceedings of the Nutrition Society of Australia* 5: 220 pp.
- CP** <Additional> Harju, E., Stolley, H., Schlage, C., Decker, K., Dotis, Glatzle, D., Hinselmann, M.,

Boni, H., Wassmer, A., Brubacher, G., Ritzel, G., Kramer, U., Bitsch, R., Hotzel, D., Pietrzik, K., Pollitt, N. T., Salkeld, R. M., Dersi, A., Jagerstad, M., Kallner, A., Hartmann, D., Hornig, D., Aldashev, A., Jaus, H., Sturm, G., Grassle, B., Romen, W., Siebert, G., Abdulla, M., Norden, A., Qvist, I., Svensson, S., Habermann, J., Horn, K., Scriba, P. C., Parry, W. H., Rudas, B., Prokop, K., Prosenbauer, G., and Hruby, J. 1977. second european nutrition conference, munich, september 14-17, 1976. short communications. dietary recommendations. *Nutrition and Metabolism* 21(Suppl. 1): 13-53.

- CP** <Additional> Kleinwort, E. J., Speer, V. C., Ai, C., Magee, W. T., Miller, E. R., Ekstrom, K. E., Benevenga, N. J., Grummer, R. H., Ely, W. T., Covert, R. L., Ullrey, D. E., Harrington, D. D., Hammell, D. L., Hays, V. W., Cromwell, G. L., Hitchcock, J. P., and Orr, D. E. 1972. abstracts of papers to be presented at the meeting of the midwestern section, asas, november 24 and 25, 1972, chicago, illinois. *Journal of Animal Science* 35(5): 1087-1136.
- CP** <Additional> Lohrey, E., Gray, I., Hughes, R., Creamer, L. K., Matheson, A. R., Lohrey, E. E., Ruiz, L. P. Jr., Harris, P. M., James, K. A. C., Hove, E. L., Richold, M., Robinson, M. F., Casey, C. E., McKenzie, J. M., Rij, A. M. van, Rea, H., Goulding, A., McChesney, R., Grigor, M. R., Robinson, A. M., Wright, D. E., Payne, E., Kirton, A., Pyle, C., Aitken, W. M., Birkbeck, J. A., Truswell, A., Thomas, B. J., McClean, H. E., Beaven, D. W., and Christie, K. J. 1976. nutrition society of new zealand, 11th annual conference, february 3-5 1976, massey univ., palmerston north. abstracts of research reports and current topics. *Proceedings of the Nutrition Society of New Zealand* 1: A1-A15.
- CP** <Additional> McDaniel, G. R., Coleman, M. A., McGibbon, W. H., Martin, G. A., West, J. R., Morgan, G. W., Mashaly, M. M., Proudman, J. A., Wentworth, B. C., Menge, H., Frobish, L. T., Miller, P. C., Sunde, M. L., Mitchell, R. L., Buckland, R. B., Kennedy, B. W., Nordskog, A. W., Sato, M., Oderkirk, A. H. F., Ogasawara, F. X., Fuqua, C. L., Tripathi, K. C., Opel, H., McGuire, S. R., Arcos, M., Palafox, A. L., Scott, J. T., Creger, C. R., Sexton, T. J., Fewlass, T. A., Sibbles, F. A., Verma, O. P., Maloney, M. A., Briles, C. O., Simpson, S. W., Goodwin, T. L., Siopes, T. D., Wilson, W. O., Smyth, J. R. Jr., Classen, H. L., Somes, R. G. Jr., Stadelman, W. J., Stone, H. A., Thomas, W. G., Bray, D. J., Touchburn, S. P., Broadbent, A. B., Westfall, F. D., Howarth, B. Jr., Wolff, E., Woodard, A. E., Abplanalp, H., Snyder, R. L., Borelli, J., Yu, W. C. Y., Burke, W. H., Zavos, P. M., Hanson, R., and Graham, E. F. 1976. 65th annual meeting of the poultry science association (continuation). *Poultry Science* 55: 2004-2111.
- CP** <Additional> Sae-Eung, P., Dryden, P., Briggs, D. R., Jones, G. P., Read, R. S. D., Reilly, C., Harrison, F., Samman, S., Roberts, D. C. K., Helman, A. D., Danesi, C. J., McLennan, E. A., Pargeter, K. A., and Burke, L. 1983. proceedings of the 8th annual conference, brisbane, queensland, november 1983. *Proceedings of the Nutrition Society of Australia* 8: xi + 216pp.
- Plant** <Additional> Tiller, K., Chamel, A., Gambonnet, B., Garcia, G., L'Annunziata, M. F., Ortega, M. L., Alvarado, R., D'Souza, T. J., Mistry, K. B., and Gissel-Nielsen, G. 1979. micronutrients. <document title> international atomic energy agency: isotopes and radiation in research on soil-plant relationships. *International Atomic Energy Agency* : 359-434.
- CP** <Additional> Winge, D. R., Premakumar, R., Everett, G. A., Apgar, J., Evans, G. W., Johnson, P. E., Turk, D. E., Sobocinski, P. Z., Canterbury, W. J., Mapes, C. A., Greeley, S., Fosmire, G. J., Ritchey, S. J., Korslund, M. K., Ramachandran, C. K., Shah, S. N., Ellis, R., Morris, E. R., Squibb, K. S., Feldman, S. L., Cousins, R. J., Calhoun, N. R., Howard, M. P., McDaniel, E. G., Smith, J. C. Jr., Eckhart, C. D., Duncan, J. R., Sloan, M. V., Hurley, L. S., Matson, C. F., Sobocinski, P. Z., Abraham, C., Hathcock, J. N., Song, M. K., Adham, N. F., Rumble, W. F., Aamodt, R. L., Henkin, R. I., Bodzy, P. W., Freeland, J. H., Eppright, M. A., Tyree, A., Hsu, J. M., Anthony, W. L., Butler, L. C., Taylor, M. L., McCurdy, P. R., Mahmood, L., Powanda, M. C., Dinterman, R. E., Hauer, E. C., Rabbani, P., and Prasad, A. S. 1977. federation of american societies for experimental biology; 61st annual meeting, chicago, illinois april 1 - 8, 1977. zinc. *Federation Proceedings* 36(3): 1100-1101, 1138-1139.

- Rev** Adeloje, A. and Warkany, J. 1976. experimental congenital hydrocephalus. a review with special consideration of hydrocephalus produced by zinc deficiency. *Child's Brain* 2(6): 325-60.
- Mineral** Adeola, O., Lawrence, B. V., Sutton, A. L., and Cline, T. R. 1995. phytase-induced changes in mineral utilization in zinc-supplemented diets for pigs. *Journal of Animal Science* 73(11): 3384-3391.
- Nut** Adewusi, S. R. and Ilori, M. O. 1994. nutritional evaluation of spent grains from sorghum malts and maize grit. *Plant Foods for Human Nutrition* 46(1): 41-51.
- Nut def** Adisa, A. O. and Odutuga, A. A. 1998. changes in the activities of three diagnostic enzymes in the heart of rats following the consumption of diets deficient in zinc and essential fatty acids. *Biochemistry And Molecular Biology International*. 46(3): 571-576.
- Nut def** Adisa, A. O. and Odutuga, A. A. responses of aspartate aminotransferase and alanine aminotransferase to induced essential fatty acid and zinc deficiencies in the heart and lungs of rats. *Med. Sci. Res. (1998)* 26(1): 25-26.
- Nut** Adjarov, D. G., Naydenova, E. N., Kerimova, M. A., Pentieva, K. D., Ivanova, L. B., and Ivanova, A. V. influence of protein calorie malnutrition and fasting on the activities of .delta.-aminolevulinic acid dehydratase and porphobilinogen deaminase in rats. *Exp. Toxicol. Pathol. (1994)* 46(3): 199-202.
- Abstract** Adkins, R. S., Lee, D. D. Jr, and McCoy, G. C. interrelationships of trace elements on growth. *J ANIM SCI. Journal of Animal Science*. 39 (5). 1974 996
- Unrel** Adkins, Yuriko, Zicker, Steven C., Lepine, Allan, and Lonnerdal, Bo. changes in nutrient and protein composition of cat milk during lactation. *Am. J. Vet. Res. (1997)* 58(4): 370-375.
- No Oral** Adler, M., Dinterman, R. E., and Wannemacher, R. W. 1997. protection by the heavy metal chelator n,n,n',n'-tetrakis (2-pyridylmethyl)ethylenediamine (tpen) against the lethal action of botulinum neurotoxin a and b. *Toxicon* 35(7): 1089-100.
- Nut def** Ads, A. H. and Kamel, M. M. 1986. electron-microscopic changes of the rat buccal epithelium induced by zinc-deficient diet. *Journal of the Egyptian Medical Association* 69(9-12): 453-464.
- Nut def** Ads, Amina H. and Kamel, Moustafa M. electron-microscopic changes of the rat buccal epithelium induced by a zinc-deficient diet. *J. Egypt. Med. Assoc. (1986)* 69(9-12): 453-64.
- Org Met** Advani, R. and <Editors> Jackson, W. B. 1995. mouse populations and their control in new york city. *International Biodeterioration & Biodegradation* 36(1/2): 135-141.
- Org Met** Advani, R. and Prakash, I. evaluation of zinc aluminum phosphide and rh-787 in reducing rodent damage to chili capsicum-annuum grown in rajasthan india. *INDIAN J AGRIC SCI. Indian Journal of Agricultural Sciences*. 54 (6). 1984 (Recd. 1985). 500-505.
- Org Met** Advani, Ranjan and Prakash, Ishwar. evaluation of zinc, aluminum phosphide and rh-787 in reducing rodent damage to chilli grown in rajasthan. *Indian J. Agric. Sci. (1984)* 54(6): 500-5.
- FL** Afanas'ev, I. u. I., Kaletina, N. I., Kharitonov Iu Ia, Lazurina, L. P., Kakushkina, M. L., Zakharova, V. F., and Garstukova, L. G. 1995. [role of trace elements in disorders and correction of metal ligand homeostasis]. <original> rol' mikroelementov v narushenii i korrektsii metalloligandnogo gomeostaza. *Vestnik Rossiiskoi Akademii Meditsinskikh Nauk* (10): 44-8.
- Drug** Agarwal, D. K., Eustis, S., Lamb, J. C. 4th, Reel, J. R., and Kluwe, W. M. 1986. effects of di(2-

ethylhexyl) phthalate on the gonadal pathophysiology, sperm morphology, and reproductive performance of male rats. *Environmental Health Perspectives* 65: 343-50.

- Alt** Agarwal Neeraj. 1994. diurnal expression of ngf1-a mrna in retinal degeneration slow (rds) mutant mouse retina. *FEBS (Federation of European Biochemical Societies) Letters* 339(3): 253-257.
- Gene** Agellon, L. B. 1997. partial transfection of liver with a synthetic cholesterol 7 alpha-hydroxylase transgene is sufficient to stimulate the reduction of cholesterol in the plasma of hypercholesterolemic mice. *Biochemistry and Cell Biology* 75(3): 255-62 .
- FL** Agergaard, N. and Palludan, B. 1974. (zinc metabolism in swine. vii. alkaline phosphatase activity in plasma and tissues in relation to zinc status). *<Document Title>Aarsberetning* . 47-59.
- FL** AGRANOVSKAYA, B. A. effect of prophylactic micro element vitamin food supplements on the reproductive function of white rats treated with carbon di sulfide. *TR LENINGR SANIT-GIG MED INST; 103. 1973 118-120*
- FL** AGRANOVSKAYA, B. A. effect of prophylactic trace element-vitamin feedings on the generative function of white rats exposed to carbon disulfide. *TR LENINGRAD SANIT-GIG MED INST 103:118-120,1973*
- Nut def** Agren, M. S. 1991. collagen synthesis in connective tissue of wounded rat mesentery: effect of dietary zinc deficiency. *European Journal of Surgery* 157(8): 453-5.
- Unrel** Agren, M. S. 1990. studies on zinc in wound healing. *Acta Dermato-Venereologica. Supplementum* 154: 1-36.
- Nut def** Agren, M. S. and Franzen, L. 1990. influence of zinc deficiency on breaking strength of 3-week-old skin incisions in the rat. *Acta Chirurgica Scandinavica* 156(10): 667-70.
- Phys** Agren, M. S., Krusell, M., and Franzen, L. 1991. release and absorption of zinc from zinc oxide and zinc sulfate in open wounds. *Acta Dermato-Venereologica* 71(4): 330-3.
- Bact** Agren, M. S., Soderberg, T. A., Reuterving, C. O., Hallmans, G., and Tengrup, I. 1991. effect of topical zinc oxide on bacterial growth and inflammation in full-thickness skin wounds in normal and diabetic rats. *European Journal of Surgery* 157(2): 97-101.
- Unrel** Agren Magnus S(A), Franzen Lennart, and Chvapil Milos. 1993. effects on wound healing of zinc oxide in a hydrocolloid dressing. *Journal of the American Academy of Dermatology* 29(2 PART 1): 221-227.
- Nut** Agte, V. V., Paknikar, K. M., and Chiplonkar, S. A. effect of riboflavin supplementation on zinc and iron absorption and growth performance in mice. *Biol. Trace Elem. Res. (1998)* 65(2): 109-115.
- Phys** Aguayo, Luis G. and Alarcon, Juan M. modulation of the developing rat sympathetic gabaa receptor by zn++, benzodiazepines, barbiturates and ethanol . *J. Pharmacol. Exp. Ther. (1993)* 267(3): 1414-22.
- CP** Aguayo Luis G, Alarcon Juan M, and Pancetti Floria C. 1992. postnatal development of gaba-a receptors in rat sympathetic neurons. *Society for Neuroscience Abstracts* 18(1-2): 655.
- CP** Aguilar, A. E., Heras, M., Saldivar, L., Valiente, L., Pastelin, P., and Lastra, M. D. 1998. effects

of zinc supplementation on the thymic index. *Met. Ions Biol. Med. Proc. Int. Symp., 5th* : 418-422. Editor(s): Collery, Phillipe. Publisher: Libbey Eurotext, Montrouge, Fr..

- Unrel** Aguilar, M. V., Laborda, J. M., Martinez-Para, M. C., Gonzalez, M. J., Meseguer, I., Bernao, A., and Mateos, C. J. effect of diabetes on the tissular zn/cu ratio. *J. Trace Elem. Med. Biol. (1998)* 12(3): 155-158.
- No Oral** Agulnick, A. D., Taira, M., Breen, J. J., Tanaka, T., Dawid, I. B., and Westphal, H. 1996. interactions of the lim-domain-binding factor ldb1 with lim homeodomain proteins. *Nature* 384(6606): 270-2.
- No Oral** Ahmad, M., Salahuddin, Mathew, B. M., Kumar, S., Seth, T. D., Hasan, M. Z., and Mahdi, S. Q. effect of extent of myocardial damage on the behavior of myocardial zinc in albino rats. *Adv. Myocardiol. (1980)* : 2, 171-6.
- CP** Ahmed, S. B. and Russell, R. M. effect of ethanol on zinc balance a cause of tissue zinc depletion a rat study. *TSANG, R. C. AND B. L. NICHOLS, JR. (ED.). PROGRESS IN CLINICAL AND BIOLOGICAL RESEARCH, VOL. 61. NUTRITION AND CHILD HEALTH: PERSPECTIVES FOR THE 1980S; PROCEEDINGS OF THE 21ST ANNUAL MEETING OF THE AMERICAN COLLEGE OF NUTRITION, BETHESDA, MD., USA, SEPT. 8-9, 1980. XII+224P. ALAN R. LISS, INC.: NEW YORK, N.Y., USA. ILLUS. ISBN 0-8451-0061-0. 0 (0). 1981. P193.*
- Nut def** Ahmed, Saffia B. and Russell, Robert M. the effect of ethanol feeding on zinc balance and tissue zinc levels in rats maintained on zinc-deficient diets. *J. Lab. Clin. Med. (1982)* 100(2): 211-17.
- Drug** Ahn, Joungjwa and Koo, Sung I. effects of zinc and essential fatty acid deficiencies on the lymphatic absorption of vitamin a and secretion of phospholipids . *J. Nutr. Biochem. (1995)* 6(11): 595-603.
- Nut def** Ahn, Joungjwa and Koo, Sung I. intraduodenal phosphatidylcholine infusion restores the lymphatic absorption of vitamin a and oleic acid in zinc-deficient rats. *J. Nutr. Biochem. (1995)* 6(11): 604-12.
- FL** Ahn, S. H., Um, J. S., Kim, D. H., and Paik, I. K(A). 1998. effects of the sources and levels of supplemental zinc on the performance of weanling pigs. *Korean Journal of Animal Science* 40(1): 9-20.
- FL** Ahn, S. H., Um, J. S., and Paik, I. K. 1999. effects of dietary sources and levels of zn on the performance and characteristics of serum and faeces in weanling pigs. *Korean Journal of Animal Science* 41(6): 607-616.
- CP** Ahn, Y. H(A), Kim, Y. H(A), Hong, S. H(A), Jou, I., and Koh, J. Y. 1998. chelation on intracellular zinc induces protein synthesis-dependent neuronal apoptosis in cortical cultures. *Society for Neuroscience Abstracts* 24(1-2): 1945.
- FL** Ai Hua, Chen Jidi, and He Shipeng. 1994. induction of testis metal-binding protein of rats by zinc deficiency and its relation to testosterone. *Acta Nutrimenta Sinica* 16(3): 274-279.
- Nut** Aiba, Kazuhiro, Kimura, Masahiro, Sakata, Shigeko, Matsuda, Koichi, Kaneko, Masae, Onosaka, Satomi, Yamamoka, Yumiko, and Tamaki, Nanaya. cosinor analysis of feed intake cycle of rats fed a zinc-deficient diet and the effect of zinc supplementation. *J. Nutr. Sci. Vitaminol. (1997)* 43(3): 327-343.
- Abstract** Aiken, S. P., Horn, N. M., and Saunders, N. R. 1989. effect of histidine on zinc distribution in

anesthetized rats. *Journal Of Physiology-London* 418: P144.

- FL** Ait-Oukhatar, N., Bureau, F., Boudey, M., Place, C., Jauzac, P., Drosdowsky, M. A., Arhan, P., and Bougle D(A). 1996. determination of metallothioneins by hplc: application to zinc metabolism. *Annales De Biologie Clinique* 54(2): 87-90.
- FL** Aituganov, M. D. and Korokhova, V. V. 1986. effect of ammonium sulphate and vitamins e, c and b-6 on the metabolism of iodine, copper, cobalt and zinc in ewes. *Mikroelementy v Zhivotnovodstve i Rastenievodstve, Frunze, Kirgiz SSR* (21): 43-55.
- Phys** Akama Kuniko(A), Sato Hiroki, Oguma Koichi, and Nakano Minoru(A). 1997. isolation of intact transition protein 2 with three zinc finger motifs from boar late spermatid nuclei. *Biochemistry and Molecular Biology International* 42(5): 865-872.
- Nut def** Akazawa, N., Koyanagi, T., Kawamura, M., and Kimura, S. effects of zinc deficiency on the function of gonadal hormone secretion and transformation from carotene to vitamin a in the rats. *Biomed. Res. Trace Elem. (1992)* 3(2): 165-6.
- Nut def** Akazawa, Noriko, Taniguchi, Kazuyuki, Ogawa, Kazushige, and Kawamura, Mieko. effects of zinc deficiency on functioning of the pituitary-gonadal axis in young male rats. *Biomed. Res. Trace Elem. (1994)* 5(2): 85-91.
- Alt** Akert, K., Cuenod, M., and Moor, H. 1971. further observations on the enlargement of synaptic vesicles in degenerating optic nerve terminals of the avian tectum. *Brain Research* 25(2): 255-63.
- Mix** Akhmetov, R. M. 1975. effect of trace elements on productivity of sows and on growth and development of young. *Khimiya v Sel'Skom Khozyaistve* 13(3): 200-202.
- No COC** Akiba, Y. and Matsumoto, T. 1982. effects of dietary cellulose and alfalfa meal on fatty livers induced by force-feeding in chicks. *Nutrition Reports International* 25(5): 799-808.
- No COC** Akitake, Tsuyoshi. poisoning of organic mercury compounds. *Igaku Kenkyu (1968)* 38(3): 357-78 .
- Bact** Akiyama, H., Yamasaki, O., Kanzaki, H., Tada, J., and Arata, J. 1998. effects of zinc oxide on the attachment of staphylococcus aureus strains. *Journal of Dermatological Science* 17(1): 67-74.
- No Oral** Akkas, N., Yeni, Y. N., Turan, B., Delilbasi, E., and Gunel, U. 1997. effect of medication on biomechanical properties of rabbit bones: heparin induced osteoporosis. *Clinical Rheumatology* 16(6): 585-95.
- No COC** Akkilic, M. and Erdinc, H. 1982. the effect of albac (zinc bacitracin) on egg production, feed intake and mortality in laying hens. *Ankara Universitesi Veteriner Fakultesi Dergisi* 29(1/2): 41-49.
- No Oral** Aksoy, A. and Sullivan, T. W. 1977. interrelationship of dietary vitamin d3 with zinc and iron in young turkeys. *Poultry Science* 56(2): 491-498.
- Nut def** Aksoy, M. 1972. carbohydrate metabolism in severe and longstanding iron-deficiency anemia due to dietary and zinc deficiencies. *American Journal of Clinical Nutrition* 25(3): 262-3.
- Nut def** Al-Atteyah, K. A. and Al-Othman, A. A. King Saud Univ. Riyadh Saudi Arabia Faculty of Agriculture. 1995. influence of dietary zinc on lipoprotein cholesterol and organ lipids and trace

elements in rats. *Annals of Agricultural Science*. V. 40(1) P. 269-278

- Bact** al-Bader, A. A., Mathew, T. C., Abul, H., al-Mosawi, M., Panigrahi, D., and Dashti, H. 1998. bacterial translocation in thioacetamide induced liver cirrhosis in rats. *Journal of the Royal College of Surgeons of Edinburgh* 43(4): 278-82.
- Abstract** Al-Hayali, R., Hsieh, S., and Navia, J. M. gestational and post natal dietary zinc and dental caries. 59TH MEETING OF THE INTERNATIONAL ASSOCIATION FOR DENTAL RESEARCH AND THE ANNUAL MEETING OF THE AMERICAN ASSOCIATION FOR DENTAL RESEARCH, CHICAGO, ILL., USA, MARCH 19-22, 1981. *J DENT RES*. 60 (Spec. Issue A). 1981. 401.
- Unrel** Al-Hayali, Rashid Nouri. 1981. effect of gestational and lactational zinc deficiency on the developing dental tissues and incidence of dental caries in the rat. *Avail.: Univ. Microfilms Int. Order No. 8129520 From: Diss. Abstr. Int. B* 1982, 42. 7. 2786. 191 pp.
- No COC** Al-Jawad, A. B. and Lees, J. L. 1985. effects of ewe's colostrum and various substitutes on the serumimmunoglobulin concentration, gut closure process and growth rate of lambs. *Animal Production* 40(1): 123-127.
- Abstract** Al-Mukhtar, F. J. M. Bristol Polytechnic UK. 1988. studies on dietary zinc and copper concentration and their homeostatic balance in mammalian blood and liver. *Index to Theses Accepted for Higher Degrees in the Universities of Great Britain and Ireland*. V. 36(2) P. 798
- No Dose** Al Nagdy, S. A., Saoud, M. F. A., and Morcos, N. Y. S. serum and tissue enzymes and trace elements in hamsters with schistosomiasis mansoni and/or protein energy malnutrition. *Qatar Univ. Sci. J.* (1996) 16(1): 39-50: 1023-8948.
- Nut def** Al-Naief, Nasser A. H. Said and Ashrafi, Shahid H. time-related changes induced by zinc-deficient diet in the concentration of rat cheek epithelial membrane-coating granules. *Arch. Oral Biol.* (1995) Volume Date 1995, 40(8): 717-22.
- Nut def** al-Othman, A. A., Rosenstein, F., and Lei, K. Y. 1994. pool size and concentration of plasma cholesterol are increased and tissue copper levels are reduced during early stages of copper deficiency in rats. *Journal of Nutrition* 124(5): 628-35 .
- Abstract** Al-Zubaidy, S. S. and Sullivan, T. W. antibiotics probiotics and high level copper in turkey diets. *Poultry Science*. 56 (5). 1977 1692-1693
- Mix** Al-Zuhair, H., El-Fattah, A. A. A., and El-Sayed, M. I. Pharmacology Department Faculty of Pharmacy King Saud University PO Box 22452 Riyadh 11495 Saudi Arabia. 1998. the effect of meclofenoxate with ginkgo biloba extract or zinc on lipid peroxide, some free radical scavengers and the cardiovascular system of aged rats. *Pharmacological Research*. V. 38(1) P. 65-72
- Acu** Alarcon, O. M., Burguera, J. L., and Burguera, M. 1987. effect of acute excess of vitamin a on serum concentrations of sodium,potassium, magnesium, iron, zinc and copper in rats. *Archivos Latinoamericanos De Nutricion* 37(2): 305-311.
- No Oral** Alberts, J. R. and Brunjes, P. C. 1978. ontogeny of thermal and olfactory determinants of huddling in the rat. *Journal of Comparative and Physiological Psychology* 92(5): 897-906.
- Nut def** Alberts, Janet C., Lang, John A., Reyes, Pilar S., and Briggs, George M. 1977. zinc requirement of the young guinea pig. *J. Nutr.* 107(8): 1517-27 .
- No Oral** Albores, A. Koropatnick J. Cherian M. G. and Zelazowski A. J. 1992. arsenic induces and enhances rat hepatic metallothionein production in vivo. *Chem.-Biol.Interact.* 85(2/3): 127-

- Diss** Albuquerque, R. de. 1988. effect of sodium chloride, zinc oxide and potassium iodide, compared with feed restriction, on induced moulting in laying hens and their productivity. *Departamento De Cricao De Ruminantes e Alimentacao Animal, Faculdade De Medicina Veterinaria e Zootecnia, Universidade De Sao Paulo, Sao Paulo, Brazil.* 86 pp.
- CP** ALCEDO, J. and WETTERHAM, K. 1990. effect of chromium-vi on metallothionein gene expression. *81ST ANNUAL MEETING OF THE AMERICAN ASSOCIATION FOR CANCER RESEARCH*
- Gene** Alcedo, Joy A., Misra, Manoj, Hamilton, Joshua W., and Wetterhahn, Karen E. 1994. the genotoxic carcinogen chromium(vi) alters the metal-inducible expression but not the basal expression of the metallothionein gene in vivo. *Carcinogenesis* 15(5): 1089-92 .
- Unrel** Alder, J., Cho, N. K., and Hatten, M. E. 1996. embryonic precursor cells from the rhombic lip are specified to a cerebellar granule neuron identity. *Neuron* 17(3): 389-99.
- Food** Aldrian, Pamela S., Keen, Carl L., Lonnerdal, Bo, and Dewey, Kathryn G. effects of coffee consumption on iron, zinc and copper status in nonpregnant and pregnant sprague-dawley rats. *Int. J. Food Sci. Nutr.* (1997) 48(3): 177-189
- Nut def** Aleksandrowicz, J., Astaldi, G., Bodzon, A., Lisiewicz, J., Mysliwiec, D., Sasiadek, U., Strycharska, M., and Walewska-Czyzewska, M. trace elements and immunologic defects. zinc deficiency and activity lysosomal acid phosphatase in lymphocyte of mice. *Bollettino Dell'Istituto Sieroterapico Milanese* 55(3): 195-200
- Nut def** Aleksandrowicz, J., Astaldi, G., Bodzon, Anna, Lisiewicz, J., Mysliwiec, Danuta, Sasiadek, Ursula, Strycharska, Maria, and Walewska-Czyzewska, Maria. trace elements and immunologic defects. zinc deficiency and activity of lysosomal acid phosphatase in lymphocyte of mice. *Boll. Ist. Sieroter. Milan.* (1976) 55(3): 195-200.
- Nut def** Aleksandrowicz, Julian, Wazewska-Czyzewska, Maria, Bodzon, Anna, Dubis, Krystyna, Kobylecka, Kazimiera, Kowalczyk, Katarzyna, Kulig, Daniel, Lisiewicz, Jerzy, Mysliwiec, Danuta, and et al. effect of zinc and magnesium deficiency in feeds on some aspects of immune responses in laboratory animals. *Rocz. Nauk. Zootech.* (1977) 4(1): 103-12
- FL** Aleksiev, A., Danov, D., Semkov, M., and Georgiev, B. 1971. effect of zinc on semen production in bulls. *Nauchni Trudove. Vissh Selskostopanski Institut "Georgi Dimitrov". Zootehnikheski Fakultet* 22: 139-144.
- No COC** Alex, S., Braverman, L. E., Fang, S. L., Norvell, B., Robinson, S., Franz, C., and Longcope, C. 1998. dehydroepiandrosterone sulfate does not prevent spontaneous and iodine-induced lymphocytic thyroiditis and diabetes mellitus in the bb/wor rat. *European Journal of Endocrinology* 138(6): 719-23.
- FL** Alexsandrowicz, J., Wazewska-Czyzewska, M., Bodzon, A., Dubis, K., Kobylecka, K., Kowalczyk, K., Kulig, D., Lisiewicz, J., Mysliwiec, D., Plonkova, I., Ronikier, A., Sasiadek, U., and Strycharska, M. 1977. effect of deficiency of zinc and magnesium in feeds on some aspects of immunity in laboratory animals. *Roczniki Naukowe Zootechniki* 4(1): 103-112.
- Unrel** Aleykutty, N. A(A), Srinivasan, K. K(A), Rao, P. Gundu(A), Udupa, A. L., and Keshavamurthy, K. R. 1993. diuretic and antilithiatic activity of dendrophthoe falcata. *Fitoterapia* 64(4): 325-331.

- Herp** Alfandari, D., Wolfsberg, T. G., White, J. M., and DeSimone, D. W. 1997. adam 13: a novel adam expressed in somitic mesoderm and neural crest cells during xenopus laevis development. *Developmental Biology* 182(2): 314-30.
- Nut def** Alfaro, B. and Heaton, F. W. 1973. relationships between copper, zinc and iron in the plasma, soft tissues and skeleton of the rat during cu deficiency. *British Journal of Nutrition* 29(1): 73-85.
- Nut def** Alfaro, B. and Heaton, F. W. 1974. the subcellular distribution of copper, zinc and iron in liver and kidney. changes during copper deficiency in the rat. *British Journal of Nutrition* 32(2): 435-445.
- Nut def** Alfaro, Begona and Heaton, F. W. subcellular distribution of copper, zinc, and iron in liver and kidney. changes during copper deficiency in the rat. *Br. J. Nutr.* (1974) 32(2): 435-45.
- Unrel** Algeo, J. W., Hibbits, A. G., Bris, E. J., and Wooden, G. R. effect of 2 levels of implanted resorcylic-acid lactone and 2 levels of oral zinc bacitracin on the performance of finishing heifers. *J ANIM SCI. Journal of Animal Science.* 31 (1). 1970 234-235
- Gene** Ali, A., Krone, P. H., Pearson, D. S., and Heikkila, J. J. 1996. evaluation of stress-inducible hsp90 gene expression as a potential molecular biomarker in xenopus laevis. *Cell Stress & Chaperones* 1(1): 62-9.
- No COC** Ali, B. H., Bashir, A. K., Mugamer, I. T., and Tanira, M. O. 1996. gentamicin nephrotoxicity in the rat: influence of age and diabetes mellitus. *Human & Experimental Toxicology* 15(1): 51-55.
- Nut** Ali, H. A., Ezzo, O. H., and El-Ekhnawy, K. E. 1998. effect of zinc supplementation on reproductive performance of barkiewes under practical field condition. *Veterinary Medical Journal Giza* 46(1): 77-87.
- CP** Ali, H. I. and Harland, B. F. effects of dietary fiber and phytate in sorghum flour on iron and zinc status in weanling rats. *AMERICAN ASSOCIATION OF CEREAL CHEMISTS 74TH ANNUAL MEETING, WASHINGTON, D.C., USA, OCTOBER 29-NOVEMBER 2, 1989. CEREAL FOODS WORLD.* 34 (9). 1989. 766.
- Nut** Ali, H. I. and Harland, B. F. effects of fiber and phytate in sorghum flour on iron and zinc in weanling rats : a pilot study. *Cereal Chem.* (1991) 68(3): 234-8 .
- Diss** Ali, Habiba I. 1989. effects of dietary fiber and phytate in sorghum flour on iron and zinc status in weanling rats. *Avail.: Univ. Microfilms Int. Order No. DA9107963 From: Diss. Abstr. Int. B 1991, 52. 1. 167. 162 pp.*
- Drug** Ali, M. M., Shukla, G. S, Srivastava, R. S., Mathur, N., and Chandra, S. V. 1993. effects of vitamin e on cadmium-induced locomotor dysfunctions in rats. *Veterinary and Human Toxicology* 35(2): 109-111.
- Not Avail** Ali, Usama A. 1996. effect of lead exposure on some selected biochemical and hematological variables with special reference to reproductive toxicity in female rabbits. *Zagazig J. Pharm. Sci.* 5(2): 125-133 .
- Drug** Allain, P. and Krari, N. 1991. diethyldithiocarbamate, copper and neurological disorders. *Life Sciences* 48(3): 291-9.
- FL** Allain, P., Leblondel, G., and Streichenberger, G. 1980. [anti-inflammatory effect of aluminum

or aurin tricarboxylic acid]. <original> mise en evidence de l'action anti-inflammatoire de l'aluminon ou acide aurine tricarboxylique. *Comptes Rendus Des Seances De La Societe De Biologie Et De Ses Filiales*

- Nut** Allam, S. M., Ibrahim, S. A. A., Raya, A. K. A., and Allam, S. M. 1980. the effect of interseeding italian ryegrass (irg) with clover on the level of some minerals and their balances in metabolism trials with sheep fed prepared hays. <document title>research bulletin, faculty of agriculture, ain shams university. (No.1260): 17pp.
- Acu** Allen, J. G., Masters, H. G., Petterson, D. S. Western Australian Dept. of Agriculture Perth. Animal Health Lab., Morcombe, P. W. Western Australian Dept. of Agriculture Moora. Veterinary Field Services, and Robertson, T. A. Western Australia Univ. Nedlands. Dept. of Pathology. 1986. acute zinc toxicity in sheep. *Australian Veterinary Journal*. V. 63(3) P. 93-94
- No Control** Allen, J. G. Masters H. G. Peet R. L. Mullins K. R. Lewis R. D. Skirrow S. Z. and Fry J. 1983. zinc toxicity in ruminants. *J.Comp.Path.* 93: 363-377.
- HHE** Allen, J. I., Perri, R. T., McClain, C. J., and Kay, N. E. 1983. alterations in human natural-killer cell-activity and monocyte cyto-toxicity induced by zinc-deficiency. *Journal Of Laboratory And Clinical Medicine* 102(4): 577-589.
- Drug** Allen, K. G., Twedt, D. C., and Hunsaker, H. A. 1987. tetramine cupruric agents: a comparison in dogs. *American Journal of Veterinary Research* 48(1): 28-30.
- CP** Allen, S. E., Van Der Aar P J, Fahey, G. C. Jr, Ricke, S. C., and Berger, L. L. effects of dietary fiber on mineral availability in chicks. *ANNUAL MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE AND CANADIAN SOCIETY OF ANIMAL SCIENCE, ONTARIO, AUG. 8-11, 1982. J ANIM SCI.* 55 (Suppl. 1). 1982 (Recd. 1983). 260.
- Prim** Allen, W. R. and Sheppard, P. M. copper tolerance in some californian populations of the monkey flower-d mimulus-guttatus-d usa. *PROC ROY SOC LONDON B BIOL SCI.* 177 (1047). 1971 177-196.
- CP** Allington C(A), Ross, G. M(A), Shamovsky, I. L(A), and Riopelle, R. J(A). 1999. zinc attenuates the pro-apoptotic effects of ngf in retinal neurons. *Society for Neuroscience Abstracts.* 25(1-2): 761.
- Dead** Allison, N., Evan, S., and McDonald, R. K. 1989. when pets ingest zinc: how likely is toxicosis? *Veterinary Medicine* 84(8): 777-779.
- No Dose** Allotta, E. C., Samman, S., and Roberts, D. C. 1985. the importance of the non-protein components of the diet in the plasma cholesterol response of rabbits to casein. *British Journal of Nutrition* 54(1): 87-94.
- Mix** Allotta, E. C., Samman, S., and Roberts, D. C. K. the importance of the non-protein components of the diet in the plasma cholesterol response of rabbits to casein. *Br. J. Nutr.* (1985) 54(1): 87-94.
- Alt** Almer, G., Vukosavic, S., Romero, N., and Przedborski, S. 1999. inducible nitric oxide synthase up-regulation in a transgenic mouse model of familial amyotrophic lateral sclerosis. *Vol. 72, No. 6, Pp. 2415-2425 Journal Of Neurochemistry*
- No Dose** Alodan, M. A. and Mashaly, M. M. 1999. effect of induced molting in laying hens on production and immune parameters. *Poultry Science* 78(2): 171-7.

- Nut def** Alonso de Vega, F. D., Garcia-Partida, P., and Gutierrez Panizo, C. 1986 . levels of zn, cu, and fe in the liver, pancreas, lungs, heart, kidneys, skin, wool and hooves of sheep with an experimental chronic zinc deficiency. *Anales De Veterinaria De Murcia* 2: 67-72.
- FL** Alp, M., Kocabagli, N., Kahraman, R., and Bostan, K. 1999. effects of dietary supplementation with organic acids and zinc bacitracin on ileal microflora, pH and performance in broilers. *Turk Veterinerlik Ve Hayvancilik Dergisi* 23(5): 451-455.
- Unrel** Alva, A. K. 1994. possible utilization of flue-gas desulfurization gypsum and fly ash for citrus production: evaluation of crop growth response. *Waste Manage. (N. Y.)* 14(7): 621-7.
- Nut def** Alvares, O. and Johnson, D. 1981. effects of zinc deficiency on rat parotid gland. *Journal of Oral Pathology* 10(6): 430-5.
- Nut def** Alvares, O. F. and Meyer, J. 1968. regional differences in parakeratotic response to mild zinc deficiency. *Archives of Dermatology* 98(2): 191-201.
- Nut def** Alvares, O. F. and Meyer, J. thymidine uptake and cell migration in cheek epithelium of zinc-deficient rats. *J. Oral Pathol. (1973)* 2(2): 86-94.
- Nut def** Alvares, O. F., Meyer, J., and Gerson, S. J. activity and distribution of acid phosphatase in zinc-deficient parakeratotic rat buccal epithelium. *Scand. J. Dent. Res. (1973)* 81(6): 481-8.
- Nut def** Alvares, Olav and Johnson, Dorthea. effects of zinc deficiency on rat parotid gland. *J. Oral Pathol. (1981)* 10(6): 430-5.
- No Dose** Alvarez, J. L., Zaldivar, V., Colome, H., and Mayari, R. 1986. haematochemical indicators in a.i. bulls. i. effect of season. *Revista De Salud Animal* 8(3): 287-294.
- FL** Alvarez, L. C., Barrera, E. M., and Gonzalez, E. A. 1994. evaluation of growth promoters for broiler chickens. *Veterinaria Mexico* 25(2): 141-144.
- Nut def** Alzina De Aguilar V, Arias Gutierrez H, Villa Elizaga I, and Antillon Klussman F. 1992. zinc deficiency in the pregnant rat: effect on insulin levels binding to its receptors on liver plasma membranes. *Biology of the Neonate* 62(2-3): 167.
- FL** Amarowicz, R., Kozikowski, W., Olender, B., and Markiewicz, K. 1989. contents of iron, zinc and copper in the liver of rats given diets with different proportions of triticale flour and sodium proteinate. *Bromatologia i Chemia Toksykologiczna* 22(1): 23-27.
- FL** Amarowicz, R., Kozikowski, W., Olender, B., and Markiewicz, K. level of iron zinc and copper in the liver of rats fed a diet with triticale meal and sodium proteinate in variable proportion. *BROMATOL CHEM TOKSYKOL. Bromatologia i Chemia Toksykologiczna.* 22 (1). 1989. 23-27.
- FL** Amarowicz, Ryszard, Kozikowski, Witold, Olender, Bozena, and Markiewicz, Kazimierz. level of iron, zinc, and copper in the liver of rats fed a diet with triticale meal and sodium albuminate at different ratios. *Bromatol. Chem. Toksykol. (1989)* 22(1): 23-7.
- Phys** Ambili, M. and Sudhakaran, P. R. modulation of neutral matrix metalloproteinases of involuting rat mammary gland by different cations and glycosaminoglycans. *J. Cell. Biochem. (1999)* 73(2): 218-226.
- No COC** AMEMIYA, K., HURLEY, L. S., and KEEN, C. L. effect of 6-mercaptopurine on 65zn distribution in the pregnant rat. *TERATOLOGY* 39:387-393, 1989

- Nut def** AMEMIYA, K., KEEN, C. L., and HURLEY, L. S. protective effect of zn against 6-mercaptopurine teratogenesis. *FED PROC FED AM SOC EXP BIOL* 44:514,1985
- Nut def** Amemiya, T., Dake, Y., and Mizoguchi, T. trace elements (selenium, copper, zinc) and ocular tissues. *Biomed. Res. Trace Elem. (1990)* 1(2): 157-8.
- Nut def** Amer, A. A. Azhar Univ. Cairo Egypt Faculty of Agriculture, Abdel-Hakim, N. F., Attia, F. M., Aly, M. M. M., and Omerra, M. I. 1985. influence of dietary zinc; manganese and calcium levels for hens on some blood parameters and certain tissues egypt. *Al-Azhar Journal of Agricultural Research*. V. 4 P. 233-251
- Nut** Amer, A. A. Azhar Univ. Cairo Egypt Faculty of Agriculture, Abdel-Hakim, N. F., Attia, F. M., and El-Gallad, T. T. 1985. studies on dietary manganese requirements of growing chicks egypt. *Al-Azhar Journal of Agricultural Research*. V. 4 P. 201-214
- No COC** Amerio, M. and Parati, F. 1977. streptococcus faecium: a valid alternative to antibiotics withgrowth-promoting effects. *Revista Di Zootecnia e Veterinaria* (4): 341-345.
- Surv** Amiard-Triquet, C., Pain, D., and Delves, H. T. exposure to trace elements of flamingos living in a biosphere reserve, the camargue (france). *Environ. Pollut. (1991)* 69(2-3): 193-201 .
- Drug** Amini, S. A., Walsh, K., Dunstan, R., Dunkley, P. R., and Murdoch, R. N. maternal hepatic, endometrial, and embryonic levels of zn, mg, cu, and fe following alcohol consumption during pregnancy in qs mice. *Res. Commun. Alcohol Subst. Abuse (1995)* Volume Date 1995, 16(4): 207-19.
- Org Met** Aminzhanov, M. 1973. use of zinc phosphide in controlling stray dogs. *Mater. Konf. Molodykh Uch. Uzb. Sel'Sk. Khoz. 7th* : Meeting Date 1972, Issue Veterinariya, 5-6. Editor(s): Azimov, Sh. A; Shevchenko, N. Kh; Nurmatov, R. Sh. Publisher: Uzb. Nauchno-Issled. Vet. Inst., Tashkent, USSR.
- CP** Ammerman, C. B., Henry, P. R., Black, J. R. , Margolin, J. E., Echevarria, M. G., and Miles, R. D. 1985. tissue uptake of trace minerals as a measure of their bioavailability in ruminants and poultry. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th* : Meeting Date 1984, 699-702. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK..
- Rev** Ammerman, C. B. and Miller, S. M. 1972. biological availability of minor mineral ions: a review. *J. Anim. Sci.* 35(3): 681-694.
- BioX** Amole, B. O., Thomas, K. D., and Asemota, D. O. 1990. cations in body fluids of trypanosoma brucei in infected rabbits. *Annales De Parasitologie Humaine Et Comparee* 65(4): 155-61.
- Nut def** Amorim, C. S. C. de, Collares, E. F., Rossi, M. A., Zucoloto, S., and Souza, N. M. de. 1983. morphological study of the small intestine of rats with experimentalzinc deficiency. *Arquivos De Gastroenterologia* 20(4): 170-174.
- Phys** Amstad, P., Peskin, A., Shah, G., Mirault M-E, Moret, R., Zbinden, I., and Cerutti, P. the balance between copper zinc-superoxide dismutase and catalase affects the sensitivity of mouse epidermal cells to oxidative stress. *Biochemistry.* 30 (38). 1991. 9305-9313.
- Food** Anastasia, J. V., Braun, B. L., and Smith, K. T. general and histopathological results of a two-year study of rats fed semi-purified diets containing casein and soya protein. *Food Chem. Toxicol. (1990)* 28(3): 147-56

Fate	Andermann, G. and Dietz, M. the bio availability and pharmaco kinetics of 3 zinc salts zinc pantothenate zinc sulfate and zinc orotate. <i>European Journal of Drug Metabolism and Pharmacokinetics</i> . 7 (3). 1982. 233-240.
HHE	Andersen, H. R., Nielsen, J. B., Nielsen, F., and Grandjean, P. 1997. antioxidative enzyme activities in human erythrocytes. <i>Clinical Chemistry</i> 43(4): 562-8.
Fate	Andersen, Ole, Nielsen, Jesper Bo, Sorensen, Jens Ahm, and Scherrebeck, Leif. experimental localization of intestinal uptake sites for metals (cd, hg, zn, se) in vivo in mice. <i>Environ. Health Perspect. Suppl.</i> (1994) 102(SUPPL. 3): 199-206
Nut def	Anderson, G. H., Harris, L., Rao, A. V., and Jones, J. D. 1976. trace mineral deficiencies in rats caused by feeding rapeseed flours during growth, gestation and lactation. <i>Journal of Nutrition</i> 106(8): 1166-74.
Nut def	Anderson, G. Harvey, Harris, L., Rao, A. V., and Jones, J. D. trace mineral deficiencies in rats caused by feeding rapeseed flours during growth , gestation, and lactation. <i>J. Nutr.</i> (1976) 106(8): 1166-74.
Mix	Anderson, R. A., Bryden, N. A., Evock-Clover, C. M., and Steele, N. C. 1997. beneficial effects of chromium on glucose and lipid variables in control and somatotropin-treated pigs are associated with increased tissue chromium and altered tissue copper, iron, and zinc. <i>Journal of Animal Science</i> 75(3): 657-661.
CP	ANDERSON, R. A., BRYDEN, N. A., POLANSKY, M. M., EVOCK-CLOVER, C. M., and STEELE, N. C. 1994. tissue chromium copper zinc and iron of control and somatotropin treated pigs following chromium supplementation. <i>EXPERIMENTAL BIOLOGY</i> 94
No COC	ANDERSON, R. L. the role of zinc in nitrilotriacetate-associated renal tubular cell toxicity. <i>FOOD COSMET TOXICOL</i> ; 19 (5). 1981. 639-650.
No COC	Anderson, R. L. 1981. the role of zinc in nitrilotriacetate(NTA)-associated renal tubular cell toxicity. <i>Food and Cosmetics Toxicology</i> 19(5): 639-50.
Rev	Anderson, R. L., Bishop, W. E., and Campbell, R. L. 1985. a review of the environmental and mammalian toxicology of nitrilotriacetic acid. <i>Critical Reviews in Toxicology</i> 15(1): 1-102.
Nut	Anderson, R. L., Francis, W. R., and Lefever, F. R. effect of dietary carbohydrate type and content on the response of male rats to dietary sodium saccharin. <i>Food Chem. Toxicol.</i> (1987) 25(4): 271-5 .
No COC	Anderson, R. L. and Kanerva, R. L. effect of nitrilo tri acetate on cation balance in the rat. <i>Food and Cosmetics Toxicology</i> . 16 (6). 1978 (Recd. 1979). 563-568.
Mix	Anderson, R. L., Kanerva, R. L., Lefever, F. R., and Francis, W. R. 1986. effect of n-nitroso-n-butyl-(4-hydroxybutyl)amine exposure on the changes in mineral disposition caused by trisodium nitrilotriacetate. <i>Food and Chemical Toxicology</i> 24(3): 229-35.
Unrel	Anderson, R. S., Carlos, G. M., Robinson, I. P., Booles, D., Burger, I. H., and Whyte, A. L. 1991. zinc, copper, iron and calcium concentrations in bitch milk. <i>Journal of Nutrition</i> 121(11S): S81-S82.
Unrel	Anderson, R. S., <Editors> Kelly, N. C. , and Wills, J. M. 1996. feeding older pets. <book>manual of companion animal nutrition & feeding. 93-98.

- Unrel** Anderson, T. R. and Toverud, S. U. 1986. purification and characterization of purple acid phosphatase from developing rat bone. *Archives of Biochemistry and Biophysics* 247(1): 131-9.
- Mix** Anderson, Y. A., Ahn, P. C., and Hegarty, P. V. 1981. electrocardiographic abnormalities in obese rats fed a commercially available liquid protein diet. *Journal of Nutrition* 111(3): 568-78.
- HHE** Andersson, H., Navert, B., Bingham, S. A., Englyst, H. N., and Cummings, J. H. 1983. the effects of breads containing similar amounts of phytate but different amounts of wheat bran on calcium, zinc and iron balance in man. *British Journal Of Nutrition* 50(3): 503-510.
- No Oral** Andine, P., Axelsson, R., and Jacobson, I. 1995. the effect of anosmia on mk-801-induced behaviour in mice. *Neuroscience Letters* 190(2): 113-6.
- Phys** Andonian, M. H. and Fahim, M. A. 1987. effects of endurance exercise on the morphology of mouse neuromuscular junctions during ageing. *Journal of Neurocytology* 16(5): 589-99.
- Anat** Andonian, M. H. and Fahim, M. A. 1988. endurance exercise alters the morphology of fast- and slow-twitch rat neuromuscular junctions. *International Journal of Sports Medicine* 9(3): 218-23.
- Drug** Andreen, O. and Larsson, S. E. 1984. effects of 1,25-dihydroxycholecalciferol on fracture healing. calcium, phosphate, and zinc in callus and serum. *Archives of Orthopaedic and Traumatic Surgery. Archiv Fur*
- FL** Andreeva, T. A. effect of zinc on growth and metabolism in young bulls. *VYESTSI AKAD NAVUK BSSR SYER SYEL'SKAKHASPAD NAVUK. 1 1970 Trans 107-111.*
- IMM** Andresen Lars Ole(A). 1999. studies on the effect of divalent metal ions on exfoliative toxins from staphylococcus hyicus: indications of exha and exhb being metalloproteins. *FEMS Immunology and Medical Microbiology* 23(4): 295-301.
- FL** Andreu, H., Gimenez, A., Caballeria, J., Pares, A., Deulofeu, R., Ballesta, A. M., and Rodes, J. effects of zinc on first-pass metabolism of ethanol and alcohol dehydrogenase activity in rats. *27TH ANNUAL MEETING OF THE EUROPEAN ASSOCIATION FOR THE STUDY OF THE LIVER, VIENNA, AUSTRIA, AUGUST 26-29, 1992. J HEPATOL (AMST). 16 (Suppl. 1). 1992. S76.*
- CP** Andrews, G. A., Giraldo, C. A., Brown, D. R., Watkins, K. L., and Southern, L. L. histidine-stimulated tissue zinc accumulation and redistribution in chicks. *77TH ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC. POULT SCI. 67 (Suppl. 1). 1988. 47.*
- Gene** ANDREWS, G. K. environmental toxicology using transgenic mouse models. *Crisp Data Base National Institutes Of Health*
- Gene** Andrews, G. K., Fernando, L. P., Moore, K. L., Dalton, T. P., and Sobieski, R. J. 1996. avian metallothioneins: structure, regulation and evolution. *The Journal Of Nutrition. 126(4S): 1317S-1323S.*
- Nut def** Andrews, G. K., Gallant, K. R., and Cherian, M. G. regulation of the ontogeny of rat liver metallothionein messenger rna by zinc. *EUR J BIOCHEM. European Journal of Biochemistry. 166 (3). 1987. 527-532.*
- Nut def** Andrews, Glen K., Gallant, Karen R., and Cherian, M. George. regulation of the ontogeny of rat

liver metallothionein mrna by zinc. *Eur. J. Biochem.* (1987) 166(3): 527-31 CODEN: EJBCAI; ISSN: 0014-2956.

- No COC** Andrews, J. C., Nolan, J. P., Hammerstedt, R. H., and Bavister, B. D. 1995. characterization of n-(6-methoxy-8-quinolyl)-p-toluenesulfonamide for the detection of zinc in living sperm cells. *Cytometry* 21(2): 153-9.
- No Dose** Andrews, Jane C., Nolan, John P., Hammerstedt, Roy H., and Bavister, Barry D. role of zinc during hamster sperm capacitation. *Biol. Reprod.* (1994) 51(6): 1238-47 CODEN: BIREBV; ISSN: 0006-3363.
- Surv** Andrews, S. M., Johnson, M. S., and Cooke, J. A. distribution of trace element pollutants in a contaminated grassland ecosystem established on metalliferous fluorspar tailings. 2: zinc. *Environ. Pollut.* (1989) 59(3): 241-52 .
- Bact** Andrieux, C. and Sacquet, E. 1986. effects of amylomaize starch on mineral metabolism in the adult rat:role of the microflora. *Journal of Nutrition* 116(6): 991-998.
- FL** Andronikashvili, E. L. possible mechanism of the therapeutic action of ionizing radiation. *Soobshch. Akad. Nauk Gruz. SSR* (1972) 68(2): 313-16.
- FL** Andronikashvili, E. L., Belokobyl'skii, A. I., Mosulishvili, L. M., Shoniya, N. I., and Gelashvili, M. A. iron, zinc, chromium, and selenium in chromatin and some fractions of nonhistone proteins in normal and malignant growth. *Dokl. Akad. Nauk SSSR* (1987) 295(6): 1484-6 [Biochem.].
- FL** Andronikashvili, E. L., Belokobyl'skii, A. I., Mosulishvili, L. M., Shonia, N. I., and Gelashvili, M. A. 1987. iron, zinc, chromium, and selenium in chromatin and some fractions of nonhistone proteins in the norm and at the malignant growth. *Doklady Akademii Nauk Sssr* 295(6): 1484-1486.
- Carcin** Andronikashvili, E. L., Mosulishvili, L. M., Belokobilski, A. I., Kharabadze, N. E., Tevzieva, T. K., and Efremova, E. Y. 1974. content of some trace elements in sarcoma m-1 dna in dynamics of malignant growth. *Cancer Research* 34(2): 271-4.
- FL** Andronikashvili, E. L., Mosulishvili, L. M., Tkeshelashvili, L. K., Rcheulishvili, A. N., and Matevosian, A. E. [possibility of migration of several elements in biological systems following x-irradiation]. <original> o vozmozhnosti migratsii nekotorykh elementov v biologicheskikh sistemakh pri rentgenovskom obluchenii. *Biulleten' Eksperimental'Noi Biologii i Meditsiny* 82(11): 1361-3.
- Carcin** Andronikashvili, E. L., Mosulishvili, L. M., Tkeshelashvili, L. K., Rcheulishvili, A. N., and Matevosyan, A. E. possible migration of some elements in biological systems during x irradiation. *BYULL EKSP BIOL MED. Byulleten' Eksperimental'Noi Biologii i Meditsiny.* 82 (11). 1976 (Recd 1977) 1361-1363.
- Surv** Angelov Lyubomir(A), Kafedzhiev Venelin, Odzhakova Tsonka, and Khristov Milcho. 1998. study on geochemical environmental factors and botanical composition of pastures on transfer of some essential trace elements. ii. extent of contentment of sheep with copper and zinc. *Zhivotnov"Dni Nauki* 35(5): 77-82.
- Mix** Angerhofer, R. A. and Balczewski, L. M. 1987. *Preliminary Assessment of the Relative Toxicity of Zinc Naphthenate.* <NOTE> Study Rept. May 84-Jun 86 on Phase 1. USAEHA-75-51-0497-87
- No COC** Angerhofer, R. A., Michie, M. W., Barlow, M. P., and Beall, P. A. phase 4, toxicological study no. 75-51-0497-91, assessment of the developmental toxicity of zinc naphthenate in rats, june

1985-july 1988. *NTIS Technical Report (NTIS/AD-A235 308) 1991 Mar*;:27 Pp.

- Diss** Angono, R. S. 1988. response of old layer ducks to forced molting treatments and the relationship of their reproductive activity to a radial immuno diffusion test. *159 Leaves*
- Nut** Anjou, K., Honkanen, E., Langler, T., and Ohlson, R. nutritional assessment of rapeseed protein concentrate in combination with soy proteins as a meat extender. *Nutrition Reports International. 17 (6). 1978 587-594.*
- Nut def** Anke, M., Groppe, B., Schwarz, S., Krause, U., Arnhold, W., and Jahreis, G. 1989. influence of zinc deficiency on the iodine status of pigs. *767-776.*
- FL** Anke, M., Hennig, A., Groppe, B., and Luedke, H. effect of cadmium on growth, reproductive function, and the metabolism of iron, zinc, and copper. *Arch. Exp. Veterinaarmed. (1971) 25(5): 799-803 .*
- FL** Anke, M., Riedel, E., Bruckner, E., and Dittrich, G. 1980. mineral and trace element supplies of wild ruminants. 3. zinc content of winter grazing and the zinc status of red deer, fallow deer, roedeer and mouflons. *Archiv Fur Tierernahrung 30(5): 479-490.*
- FL** Anke, M., Riedel, E., Brueckner, E., and Dittrich, G. the supply of wild ruminants with major elements and trace elements 3. the zinc content of winter grazing and the zinc status of red deer fallow deer roes and mouflons. *ARCH TIERERNAEHR. Archiv Fuer Tierernaehrung. 30 (5). 1980. 479-490.*
- Nut def** Anke, M., Schwarz, S., Hennig, A., Groppe, B., Grun, M., Zenker, G., and Glos, S. 1980. effect of additional zinc and iodine on damage caused by extracted rapeseed meal in pigs. *Monatshefte Fur Veterinarmedizin 35(3): 90-94.*
- FL** Anon. 1999. abstracts of papers dealing with rabbits presented during the 2. symposium on housing and diseases of rabbits, furbearing animals and pet animals. celle (germany), 19-20 may 1999. <original> [resumes des papiers traitant du lapin presentes au 2. symposium sur l'elevage et les maladies des lapins, des animaux a fourrure et des animaux de compagnie. celle (allemagne), 19-20 mai 1999]. *World Rabbit Science. V. 7(3) P. 115-124*
- Nut def** anon. P20, (REF). dietary zinc deficiency impairs immune response. *Am. Pharm. NS25 ISS Aug 1985*
- Unrel** Anon. increased dental caries in young rats suckled by zinc-deficient dams. *Nutr. Rev. (1979) 37(7): 232-3 CODEN: NUREA8; ISSN: 0029-6643.*
- Unrel** ANON. the main results in radiation biology studies in 1993. *RADIATIONNAYA BIOLOGIYA RADIOEKOLOGIYA; 34 (3). 1994. 453-459.*
- Nut def** Anon. 1984. studies show zinc deficiency retards brain development in rats. *Govt Reports Announcements & Index (GRA&I)*
- Surv** Anon. 1975. zinc in the control of facial eczema. *New Zealand Agriculturist 21(1): 1-2, 7.*
- Org Met** ANON. 20460. zinc phosphide. in: epa chemical profiles.
- Abstract** Ansari, M. S., Miller, W. J., Hampton, D. L., Kincaid, R. L., Neathery, M. W., Gentry, R. P., and Lassiter, J. W. direct determination of mineral absorption sites. *J ANIM SCI. Journal of Animal Science. 43 (1). 1976 248*

- Nut** Ansari, M. S., Miller, W. J., Lassiter, J. W., Neathery, M. W., and Gentry, R. P. effects of high but nontoxic dietary zinc on zinc metabolism and adaptations in rats. *Proc. Soc. Exp. Biol. Med.* (1975) 150(2): 534-6.
- Abstract** Ansari, M. S., Miller, W. J., Neathery, M. W., Gentry, R. P., and Lassiter, J. W. zinc metabolism in rats fed high zinc 0 to 42 days. *Journal of Animal Science.* 39 (1). 1974 230
- Abstract** Ansari, M. S., Miller, W. J., Stake, P. E., Gentry, R. P., and Neathery, M. W. zinc metabolism and homeostasis failure in certain tissues of calves as influenced by duration of high zinc diet. *FED PROC. Federation Proceedings.* 32 (3 Part 1). 1973 906
- HHE** Ansari, M S, Willer, W J, Lassiter, J W, Neathery, M W, and Gentry, R P. effects of high but nontoxic dietary zinc on zinc metabolism and adaptations in rats [animal and human nutrition is well established]. *Proc Soc Exp Biol Med* Nov 1975 150 (2): 534-536. Ref.
- Nut def** Ansary, M. 1975. the a46 syndrome (hereditary zinc deficiency) in dutch black piedcattle - a deficiency of cellular immunity ? *Annales De Medecine Veterinaire* 119(7): 479-481.
- No COC** Ansel, John C., Luger, Thomas A., and Green, Ira. 1987. fever and increased serum il-1 activity as a systemic manifestation of acute phototoxicity in new zealand white rabbits. *J. Invest. Dermatol.* 89(1): 32-7.
- FL** Anshan, S. 1990. effects of zinc and calcium levels in hen diets on fertility and hatchability of the egg and their newborn chicks. *Scientia Agricultura Sinica* 23(6): 82-86.
- Abstract** Ansotegui, R. P(A), Bailey, J. D(A), Paterson, J. A(A), Hatfield, P. G(A), and Swenson, C. K. 1999. effects of supplemental trace mineral form on copper status, estrus, ovulation rate, and fertility in beef heifers. *Journal of Animal Science* 77(SUPPL. 1): 110.
- CP** Antcliffe, B. L., Kieser, D., Thompson, J. A. J., Lockhart, W. L., Metner, D. A., and Roome, R. 1997. health assessment of mountain whitefish (*prosopium williamsoni*) from the columbia river in july 1994. *Can. Tech. Rep. Fish. Aquat. Sci.* 2144, *Proceedings of the Annual Aquatic Toxicity Workshop, 23rd, 1996* 2144: 121-126.
- Aquatic** Antcliffe, B. L(A), Kieser, D., Thompson, J. A. J., Lockhart, W. L., Metner, D. A., and Roome, J. R. 1997. monitoring of mountain whitefish, *prosopium williamsoni*, from the columbia river system near castlegar, british columbia: fish health assessment and contaminants in 1994. *Canadian Technical Report of Fisheries and Aquatic Sciences* 0(2142): I-XII, 1-101.
- Bio Acc** Anthony, Robert G., Miles, A. Keith, Estes, James A., and Isaacs, Frank B. 1999. productivity, diets, and environmental contaminants in nesting bald eagles from the aleutian archipelago. *Environ. Toxicol. Chem.* 18(9): 2054-2062.
- No Oral** Anthony, William L., Woosley, Raymond L., and Hsu, Jeng M. urinary excretion of radiosulfur following taurine-35s injection in zinc-deficient rats. *Proc. Soc. Exp. Biol. Med.* (1971) 138(3): 989-92.
- No COC** Antonson, Dean L. and Vanderhoof, Jon A. effect of chronic ethanol ingestion on zinc absorption in rat small intestine. *Dig. Dis. Sci.* (1983) 28(7): 604-8.
- Drug** Anttinen, H., Oikarinen, A., Puistola, U., Paakko, P., and Ryhanen, L. 1985. prevention by zinc of rat lung collagen accumulation in carbon tetrachloride injury. *American Review of Respiratory Disease* 132(3): 536-40.
- No COC** Anttinen, H., Ryhanen, L., Puistola, U., Arranto, A., and Oikarinen, A. 1984. decrease in liver

collagen accumulation in carbon tetrachloride-injured and normal growing-rats upon administration of zinc. *Gastroenterology* 86(3): 532-539.

- Mix** Anttinen, Henrik, Oikarinen, Aarne, Puistola, Ulla, Paakko, Paavo, and Ryhanen, Lasse. 1985. prevention by zinc of rat lung collagen accumulation in carbon tetrachloride injury. *Am. Rev. Respir. Dis.* 132(3): 536-40 .
- No Oral** ANWER, J., ALI, S., and MEHROTA, N. K. antagonistic effect of zinc in lead treated developing chick embryos. *DRUG CHEM TOXICOL*; 11 (1). 1988. 85-95.
- Nut def** Aoyagi, S. and Baker, D. H. 1993. nutritional evaluation of copper-lysine and zinc-lysine complexes for chicks. *Poultry Science* 72(1): 165-71.
- Bio Acc** Aoyagi, S. K. Hiney and D. H. Baker. 1995. estimates of zinc and iron bioavailability in pork liver and the effect of sex of pig on the bioavailability of copper in pork liver fed to male and female chicks. *Journal of Animal Science.* 73: 793-798.
- Mineral** Aoyama, Y., Mori, M., Hitomi-Ohmura, E., and Yoshida, A. 1992. effects of dietary excess histidine and varying levels of copper on the metabolism of lipids and minerals in rats. *Bioscience, Biotechnology and Biochemistry* 56(2): 335-337.
- Mineral** Aoyama, Yoritaka, Mori, Manabu, and Yoshida, Akira. effects of excess histidine and copper intake on the metabolism of lipids and minerals in rats. *J. Trace Elem. Exp. Med.* (1990) 3(3): 209-17.
- No Dose** Aoyama, Yoritaka, Takagi, Mika, and Yoshida, Akira. 1995. excess dietary histidine accumulates lipids in rat liver. *Comp. Biochem. Physiol. A: Physiol.* 112A(3/4): 503-9.
- Nut def** Aoyama, Yoritaka, Takagi, Mika, and Yoshida, Akira. lipid alterations in the liver and serum of rats in histidine-excess and copper deficiency . *J. Nutr. Sci. Vitaminol.* (1999) 45(6): 773-783.
- Org Met** APA, A. D., URESK, D. W., and LINDER, R. L. black-tailed prairie dog populations one year after treatment with rodenticides. *GREAT BASIN NAT*; 50 (2). 1990. 107-114.
- No COC** Apa, A. D. Uresk D. W. and Linder R. L. 1990. black-tailed prairie dog populations one year after treatment with rodenticides. *Great Basin Nat.* 50(2): 107-113.
- No COC** Apa, A. D. Uresk D. W. and Linder R. L. 1991. impacts of black-tailed prairie dog rodenticides on nontarget passerines. *Great Basin Nat.* 51(4): 301-309.
- Nut def** Aparna Tandon, Nagpaul, J. P., Bandhu, H., Nirmal Singh, and Dhawan, D. K. 1999. effect of lithium on hepatic and serum elemental status under different dietary protein regimens. *Biological Trace Element Research* 68(1): 51-62.
- Mineral** Apgar, G. A. and Kornegay, E. T. 1996. mineral balance of finishing pigs fed copper sulfate or a copper-lysine complex at growth-stimulating levels. *Journal of Animal Science* 74(7): 1594-1600.
- Nut def** Apgar, J. 1979. alkaline phosphatase activity and zinc level in plasma as indicators of zinc status in pregnant and lactating sheep. *Nutrition Reports International* 19(3): 371-376.
- Abstract** Apgar, J. effect of low zinc intake throughout pregnancy on reproduction in the ewe. *4TH JOINT MEETING OF THE AMERICAN INSTITUTE OF NUTRITION, THE AMERICAN SOCIETY FOR CLINICAL NUTRITION AND THE CANADIAN SOCIETY FOR NUTRITIONAL*

SCIENCES, UNIVERSITY PARK, PA., USA, JULY 22-24, 1982. *AM J CLIN NUTR.* 35 (6). 1982. Xv.

- Nut def** Apgar, J. 1970. effect of zinc deficiency on maintenance of pregnancy in the rat. *Journal of Nutrition* 100(4): 470-6.
- Nut def** APGAR, J. effect of zinc deficiency on parturition in the rat. *AM J PHYSIOL* 215:160-163,1968
- CP** Apgar, J. 1978. effect of zinc repletion for limited times on parturition in rats. *Trace Elem. Metab. Man Anim. Proc. Int. Symp., 3rd* : Meeting Date 1977, 436-9. Editor(s): Kirchgessner, M. Publisher: Arbeitskreis Tierernaehrungsforschung Weihenstephan Inst. Ernaehrungsphysiol., Freising-Weihenstephan, Ger..
- Nut def** Apgar, J. 1973. effect of zinc repletion late in gestation on parturition in the zinc-deficient rat. *Journal of Nutrition* 103(7): 973-981.
- Nut def** Apgar, J. 1975. effects of some nutritional deficiencies on parturition in rats. *Journal of Nutrition* 105(12): 1553-1561.
- CP** Apgar, J. 1982. esophageal parakeratosis in adult-rats fed a low-zinc diet. *Federation Proceedings* 41: 283.
- Nut def** Apgar, J. 1977. mobilization of vitamin a by the zinc-deficient female rat. *Nutrition Reports International* 15(5): 553-559.
- Nut def** APGAR, J. use of edta to produce zinc deficiency in the pregnant rat. *J NUTR* 107:539-545,1977
- No Oral** Apgar, J. zinc requirement for normal parturition in rats.
- Unrel** Apgar, J. and Everett, G. A. changes in angiotensin-converting enzyme during pregnancy in the guinea pig. *Gynecol. Obstet. Invest. (1989)* 27(4): 169-72 .
- CP** Apgar, J. and Everett, G. A. 1988. effect of zinc deficiency on the guinea pig during pregnancy. *Trace Elem. Anal. Chem. Med. Biol. Proc. Int. Workshop, 5th* : 576-80. Editor(s): Braetter, Peter; Schramel, Peter. Publisher: de Gruyter, Berlin, Fed. Rep. Ger.
- Nut** Apgar, J. and Everett, G. A. 1991. the guinea pig as a model for effects of maternal nutrition on pregnancy outcome. *Nutrition Research.* 11(8): 929-939.
- Nut def** Apgar, J. and Fitzgerald, J. A. 1985. effect on the ewe and lamb of low zinc intake throughout pregnancy. *Journal of Animal Science* 60(6): 1530-1538.
- Abstract** Apgar, J. and House, W. A. improved semi purified diet for study of zinc requirement of pregnant ewes. *ANNUAL MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE AND CANADIAN SOCIETY OF ANIMAL SCIENCE, ONTARIO, AUG. 8-11, 1982. J ANIM SCI.* 55 (Suppl. 1). 1982 (Recd. 1983). 404.
- Nut def** Apgar, J., House, W. A., Welch, R. M., <Editors> J.M. Gawthorne, and others. 1982. low zinc diet: effect on pregnant and lactating ewe. <document title>trace element metabolism in man and animals. 268-270.
- Nut def** Apgar, J. and Travis, H. F. CS US Plant Soil Nutr. Lab. Ithaca New. effect of a low zinc diet on the ewe during pregnancy and lactation. 48(5): 1234-1238.

- Nut def** Apgar, J. and Fitzgerald J. A. 1985. effect on the ewe and lamb of low zinc intake throughout pregnancy. *J Anim Sci.* 60: 1530.
- Nut def** Apgar, Jean. effect of a low zinc diet during gestation on reproduction in the rabbit. *J. Anim. Sci. (1971)* 33(6): 1255-8.
- Nut def** Apgar, Jean. effect of zinc deficiency on maintenance of pregnancy in the rat. *J. Nutr. (1970)* 100(4): 470-6.
- Nut def** Apgar, Jean. effect of zinc repletion late in gestation on parturition in the zinc-deficient rat. *J. Nutr. (1973)* 103(7): 973-81.
- QAC** Apgar, Jean. effects of some nutritional deficiencies on parturition in rats. *J. Nutr. (1975)* 105(12): 1553-61.
- Nut def** Apgar, Jean. effects of zinc deficiency and zinc repletion during pregnancy on parturition in two strains of rats. *J. Nutr. (1977)* 107(8): 1399-403.
- Nut def** Apgar, Jean. mobilization of vitamin a by the zinc-deficient female rat. *Nutr. Rep. Int. (1977)* 15(5): 553-9.
- Phys** Aposhian, H. V., Levine, D. J., Rivera, M., and Fernando, Q. 1993. determination and metabolism of dithiol chelating agents: the zinc chelate of the dimethyl ester of meso-2,3-dimercaptosuccinic acid increase biliary excretion of cadmium and platinum. *Chemical Research in Toxicology* 6(2): 208-14.
- Alt** Apostolova, M. D., Choo, K. H. A., Michalska, A. E., and Tohyama, C. analysis of the possible protective role of metallothionein in streptozotocin-induced diabetes using metallothionein-null mice. *J. Trace Elem. Med. Biol. (1997)* 11(1): 1-7
- FL** Apsite, M. 1968. effect of the trace elements cobalt, copper, zinc, and manganese on the blood of chicks. *Mikroelem. Organizme Ryb Ptits* 63-83. Editor: 63-83. Editor(s): Bermene, S.. Publisher: Izd. "Zinatne", Riga, USSR.
- Mix** Apsite, M. effect of trace nutrients and amino acid mixture on the blood system of chicks. *Regul. Rosta Metab. Zhivotn. (1971)* 169-79. Editor: 169-79. Editor(s): Valdmans, A. Publisher: "Zinatne", Riga, Latv. SSR..
- Bio Acc** Apsite, M., Atlavins, A., and Svilane, A. molybdenum and copper in subcellular fractions of chicken liver. *Vsasyvanie Obmen Pitatel'Nykh Veshchestv Org. Zhivotn. (1975)* : 137-43. Editor(s): Shmit, A. A. Publisher: "Zinatne", Riga, USSR..
- Gene** Apte, S. S., Mattei, M. G., and Olsen, B. R. 1994. cloning of the cDNA encoding human tissue inhibitor of metalloproteinases-3 (TIMP-3) and mapping of the TIMP3 gene to chromosome 22. *Vol. 19, No. 1, Pp. 86-90* Genomics
- Alt** Aquilio, E., Spagnoli, R., Riggio, D., and Seri, S. effects of zinc on hepatic ornithine transcarbamylase (OTC) activity. *J. Trace Elem. Electrolytes Health Dis. (1993)* 7(4): 240-1.
- FL** Ar'kov, A. 1991. don limestones. *Ptitsevodstvo* (10): 16-17.
- Carcin** Arachi, Hideaki. relation between zinc and malignant tumor. ii. effect of zinc on hepatoma of rat treated with n-nitrosodiethylamine. *Nara Igaku Zasshi (1972)* 23(3): 177-86.
- Carcin** Arachi, Hideaki. relation between zinc and malignant tumor. iii. zinc contents in organs of

- normal mice and effect of zinc on ehrlich ascites tumor. *Nara Igaku Zasshi* (1972) 23(3): 187-94 .
- No Oral** Arakawa, Yasuyuki, Wakiyama, Kohji, Suzuki, Kazutomo, Suzuki, Keiko, Amaki, Shuichi, Tanaka, Naohide, Matsuo, Yutaka, and Takeuchi, Shigeo. pathological significance of trace elements in experimentally cirrhotic rats treated with carbon tetrachloride. *Nihon Univ. J. Med.* (1991) 33(5): 329-42 .
- FL** Arapov, O. V., Arestova, L. S., Alferova, O. F., Krasil'nikov, I. I., and Khorseeva, L. A. 1988. [radioprotective activity of complexes of copper, cobalt and zinc with substituted acylhydrazones]. <original> radiozashchitnaia aktivnost' kompleksov medi, kobal'ta i tsinka s zameshchennymi atsilgidrazonami. *Radiobiologiya* 28(5): 691-4.
- No Oral** Araujo Viel, T., Diogo Domingos, C., da Silva Monteiro, A. P., Riggio Lima-Landman MT, Lapa, A. J., and Souccar, C. 1999. evaluation of the antiurolithiatic activity of the extract of costus spiralis roscoe in rats. *Journal of Ethnopharmacology* 66(2): 193-8.
- In Vit** Arber, S. and Caroni, P. 1996. specificity of single lim motifs in targeting and lim/lim interactions in situ. *Genes & Development* 10(3): 289-300.
- Unrel** rber Silvia and Caroni Pico(A). 1996. specificity of single lim motifs in targeting and lim/lim interactions in situ. *Genes & Development* 10(3): 289-300.
- Nut def** Arcasoy, A., Cavdar, A., Cin, S., Erten, J., Babacan, E., Gozdasoglu, S., and Akar, N. 1987. effects of zinc supplementation on linear growth in beta-thalassemia - (a new approach). *American Journal Of Hematology* 24(2): 127-136.
- Nut def** Arce, D. S. and Keen, C. L. effects of maternal zinc and iron deficiency on the development of the cytochrome p-450 enzyme system in rats. *FASEB J* 1989 Feb;3(4):A1076
- Nut def** Arce, Deborah Susan. 1990. the effects of maternal copper, iron and zinc deficiency on the postnatal development of metalloproteins and metal-protein complexes in the offspring of rats and mice. Avail.: Univ. Microfilms Int. Order No. DA9102055 From: Diss. Abstr. Int. B 1991, 51. 8. 3784. 288 pp.
- Abstract** Arce, M. J(A), Lopez, C. C., Avila, G. E., Johnson, A. B., and Fakler, T. M. 1999. use of complexed trace minerals and restricted feeding on performance and ascites mortality in broilers. *Poultry Science* 78(SUPPL. 1): 114.
- Nut def** Archana Bahuguna and Bedwal, R. S. 1998. effect of zinc deficiency on boundary layers of seminiferous tubules of testes of wistar albino rat. *Current Science* 75(6): 611-617.
- In Vit** Archard, H. O. and Denys, F. R. 1979. development of annular gap junctions in guinea pig epithelia. *Journal of Oral Pathology* 8(4): 187-97.
- No Dose** Ardiningsasi Sri Murni, Maeda Yoshizane(A), Kawabe Kotaro, Okamoto Shin, and Hashiguchi Tsutomu. 1993. comparative studies of calcium atpase activity in epiphysis of tibia tarsus of quail lines selected for body weight. *Comparative Biochemistry and Physiology A Comparative Physiology* 105(2): 219-222.
- Not Avail** Arelovich, H. M., Owens, F. N., Horn, G. W., and Vizcarra, J. A. 1998. urea utilization by cattle fed prairie hay and supplemented with zinc. *Animal Science Research Report - Agricultural Experiment Station, Oklahoma State University* (P-965): 194-198.
- Bact** Arif, A. J., Mathur, P. D., Chandra, S., Singh, C., and Sen, A. B. 1987. effect of zinc diet on

xanthine oxidase activity of liver of mice infected with plasmodium berghei. *Indian Journal of Malariology* 24(1): 59-63.

- Model** Ariosto, F., Riggio, O., Cantafora, A., Colucci, S., Gaudio, E., Mechelli, C., Merli, M., Seri, S., and Capocaccia, L. carbon tetrachloride-induced experimental cirrhosis in the rat : a reappraisal of the model. *Eur. Surg. Res. (1990)* Volume Date 1989, 21(5): 280-6.
- No Oral** Arizono, K., Nakano, M., Eto, K., Okanari, E., and Ariyoshi, T. age-related effects of lithium chloride on metals, metallothionein, cytochrome p450 and heme oxygenase in the liver of rats. *Trace Elem. Med. (1992)* 9(4): 163-7.
- No COC** Arjo, W. M. and Nolte D. L. 2004. assessing the efficacy of registered underground baiting products for mountain beaver (*aplodontia rufa*) control. *Crop Prot.* 23(5): 425-430.
- Rev** Arlette, J. P. 1983. zinc and the skin. *Pediatric Clinics Of North America* 30(3): 583-596.
- Rev** Armstrong, W. D., Featherston, W. R., and Rogler, J. C. influence of methionine and other dietary additions on the performance of chicks fed bird resistant sorghum grain diets. *Poultry Science.* 52 (4). 1973 1592-1599.
- Plant** Arnold, G. W., Wood, P. M., Nairn, M., Allen, J., Wallace, S. R., and Weeldenberg, J. comparison of lupine varieties for grain yield nutritive value of stubbles incidence of infection with phomopsis-leptostromiformis and occurrence of lupinosis. *Australian Journal of Experimental Agriculture and Animal Husbandry.* 18 (92). 1978 442-452.
- No COC** Arora, K. K. Pahwa R. Lal S. Srivastava J. L. and Kumar A. 1987. rodent control in commercial grain warehouses in india. *Pesticides (Bombay).* 21(5): 12-13.
- CP** Arora, S. P. 1982. zinc and vitamin a interrelationship in metabolism. *Trace Elem. Metab. Man Anim. Proc. Int. Symp., 4th* : Meeting Date 1981, 572-4. Editor(s): Gawthorne, J. M.; Howell, J. McC.; White, C. L. Publisher: Springer, Berlin, Fed. Rep. Ger. CODEN: 47QGAV.
- Nut def** Arora, S. P., Hatfield, E. E., Hinds, F. C., and Garrigus, U. S. 1973. influence of dietary zinc on the activity of blood vitamin a, alcoholdehydrogenase and carbonic anhydrase in lambs. *Indian Journal of Animal Sciences* 43(2): 140-144.
- No Dose** Arora, S. P. Hatfield E. E. and Hinds F. C. 1973. influence of dietary zinc on the activity of blood vitamin a, alcohol dehydrogenase and carbonic anhydrase in lambs. *J Anim Sci.* 43: 140.
- No Oral** Arora Vikram, Iversen Patrick L, and Ebadi Manuchair(A). 1998. manipulation of metallothionein expression in the regenerating rat liver using antisense oligonucleotides. *Biochemical and Biophysical Research Communications* 246(3): 711-718.
- Abstract** Arquitt, A. B., Allen, C., Smith, B., Lucas, E., and Hermann, J. R. 1997 . effects of ovariectomy and mineral restricted diets on growth and bone in rats. *FASEB Journal* 11(3): A409.
- No Dose** Arrieta Acevedo, Jose Mauro and Rosiles Martinez, Rene. hepatic concentration of selenium, copper, iron, and zinc in healthy and ascitic broilers. *Vet. Mex. (1997)* 28(4): 313-316.
- Abstract** Arthington, J. D(A), Johnson, K. R., Corah, L. R., Willms, C. L., and Hill, D. A. 1995. the effect of dietary zinc level and source on yearling bull growth and fertility. *Journal of Animal Science* 73(SUPPL. 1): 277.
- CP** ARTILLO, R., MURILLO, M. L., TAVARES, E., and CARRERAS, O. 1998. comparative effects of zinc intestinal absorption through different intestinal segments in offspring rats effects

of ethanol. *SCIENTIFIC MEETING OF THE PHYSIOLOGICAL SOCIETY*

- CP** Aruga Jun, Minowa Osamu, Kuno Junko, Yaginuma Hiroyuki, Nagai Takeharu, Noda Tetsuo, and Mikoshiba Katsuhiko. 1997. mouse zic1 has an essential role in cerebellar development. *Society for Neuroscience Abstracts* 23(1-2): 877.
- Gene** Aruga Jun, Nagai Takeharu, Nakata Katsunori, and Mikoshiba Katsuhiko. 1997. expression of zic1, zic2 and zic3, the vertebrate homologues of drosophila odd-paired during the body pattern formation process. *Developmental Neuroscience* 19(1): 121.
- No COC** Aruga Jun(A), Minowa Osamu, Yaginuma Hiroyuki, Kuno Junko, Nagai Takeharu, Noda Tetsuo, and Mikoshiba Katsuhiko . 1998. mouse zic1 is involved in cerebellar development. *Journal of Neuroscience* 18(1): 284-293.
- Nut def** Aruna Chhabra and Arora, S. P. 1987. effect of dietary zinc on the conversion of beta -carotene to vitamin ain crossbred calves. *Indian Journal of Dairy Science* 40(3): 322-325.
- Nut** Aruna Chhabra, Arora, S. P., and Jai Kishan. 1987. effect of different levels of zinc on the digestibility of organicnutrients and zinc balances. *Indian Journal of Dairy Science* 40(2): 183-186.
- Abstract** Arvat, V., Vandepopuliere, J. M., and Walton, H. V. effect of dietary changes upon bone strength of cage layers. *Poultry Science.* 56 (5). 1977 1695
- FL** Asai, Y., Mizuno, Y., Yamamoto, O., and Fujikawa, H. 1993. requirements of copper and zinc for foals in connection with theincidence of epiphysitis. *Animal Science and Technology* 64(12): 1193-1200.
- Nut** Asai Yo(A), Katsuki Ryoji, Matsui Akira, and Nanbo Yasuo. 1995. effects of rations and age on mineral concentrations of thoroughbred mare's colostrum. *Journal of Equine Science* 6(1): 21-24.
- In Vit** Asatryan, R. M., Badalyan, R. B., and Simonyan, A. A. anion-sensitive atpase in the subcellular fractions of hen brain in ontogenesis. *Neirokhimiya (1986)* 5(2): 194-9 .
- No Dose** Asberg, H. and Soderberg, U. importance of zinc for central nervous system functions. *Symp. Zink (1974)* 123-35. Editor: 123-35. Editor(s): Zederfeldt, Bengt. Publisher: AB Tika, Lund, Swed..
- Abstract** Asberg, H. and Soederberg, U. thyroxine-like effects of zinc on brain and behavior with firm dependence on several hormones. *BRAIN RES. Brain Research.* 85 (1). 1975 197-198
- Rev** Aschner, M. 1998. metallothionein (mt) isoforms in the central nervous system (cns): regional and cell-specific distribution and potential functions as an antioxidant. *Neurotoxicology* 19(4-5): 653-60.
- BioX** Ashida, K. Y., Tamura, A., Matsui, T., Yano, H., and Nakajima, T. 1999. effect of dietary microbial phytase on zinc bioavailability in growingpigs. *Animal Science Journal* 70(5): 306-311.
- Nut** Ashida Kin-Ya, Matsui Tohru(A), Itoh Jiro, Yano Hideo, and Nakajima Takashi. 2000. zinc distribution in the small-intestinal digesta of pigs fed skim milk powder or defatted soybean flour. *Biological Trace Element Research* 74(1): 31-40.
- Nut def** Ashraf, Mary Hale and Fosmire, Gary J. effects of marginal zinc deficiency on subclinical lead

toxicity in the rat neonate. *J. Nutr.* (1985) 115(3): 334-46

- Nut def** Ashrafi, S. H., Meyer, J., and Squier, C. A. 1980. effects of zinc deficiency on the distribution of membrane-coating granules in rat buccal epithelium. *Journal of Investigative Dermatology* 74(6): 425-32.
- Nut def** Ashrafi, S. H., Meyer, Julia, and Squier, C. A. effects of zinc deficiency on the distribution of membrane-coating granules in rat buccal epithelium. *J. Invest. Dermatol.* (1980) 74(6): 425-32.
- Nut def** Ashrafi, Shahid H. and Said-Al-Naief, Nasser A. H. zinc deficiency produces time-related ultrastructural changes in rat cheek epithelium. *Scanning Microsc.* (1996) 10(1): 209-218.
- Phys** Ashworth, A., Rastan, S., Lovell-Badge, R., and Kay, G. 1991. x-chromosome inactivation may explain the difference in viability of xo humans and mice [see comments]. *Nature* 351(6325): 406-8.
- No Oral** Asokan, P. and Cherian, M. G. turnover of parenterally administered zinc and cadmium and the redistribution of metallothionein bound zinc in newborn rats. *Toxicology* (1985) 36(1): 1-13.
- Soil** Assmuth, T. W. and Strandberg, T. 1993. ground water contamination at finnish landfills. *Water Air and Soil Pollution* 69(1-2): 179-199.
- CP** ASTELL, R., BAEK, J. H., and CERKLEWSKI, F. L. 1986. influence of maternal ethanol ingestion and low dietary copper on rat liver copper-zinc superoxide dismutase activity. *FIFTH JOINT MEETING OF THE AMERICAN INSTITUTE OF NUTRITION*
- Alt** Astuti, Mary, Kassoka, Seiichi, and Goto, Shiro. 1993. iron, copper and zinc balance of moderately anemic rats fed with soybean tempeh diets. *Ber. Bundesforschungsanst. Ernahr. BFE-R-93-01 Bioavailability* (pt.2): 73-7.
- Nut def** Astuti, Mary, Uehara, Mariko, and Suzuki, Kazuharu. effects of soy tempeh powder on iron, copper and zinc bioavailability in iron-deficient rats. *Nogaku Shuho (Tokyo Nogyo Daigaku)* (1987) 32(1): 108-14.
- FL** Atabekyan, G., Arzumanyan, R., Davtyan, R., Zakharyan, A., Mkrtchyan, Sh., and Ivanyan, S. 1987. additional sources of feeds (for pigs). *Svinovodstvo, Moscow* (2): 15-16.
- CP** Atallah, A. A., Hewedi, F. M., and Afify, A. S. Department of Animal Production Faculty of Agriculture Cairo University Giza Egypt. 1989. response of fayoumi chicken to force molting by high dietary zinc [animals, fish, and poultry production]. proceedings of the third egyptian british conference on animals, fish, and poultry production, 7-10 october 1989, alexandria, egypt. *P. 993-1002*
- Carcin** Atassi, G., Dumont, P., and Harteel, J. C. E. potentiation of the antitumor activity of 2-formylpyridine thiosemicarbazone by metal chelation: 2-formylpyridine thiosemicarbazone zinc sulfate (nsc 294721). *Eur. J. Cancer* (1979) 15(4): 451-9.
- CP** Aterman, K. and Yuece, G. hepato protective substances a partial assessment. *KEPPLER, D. PATHOGENESIS AND MECHANISM OF LIVER CELL NECROSIS. WORKSHOP. FREIBURG, WEST GERMANY, NOVEMBER 9-10, 1974. X+257P. ILLUS. UNIVERSITY PARK PRESS: BALTIMORE, MD., U.S.A. ISBN 0-8391-0837-0. 1975 (Recd 1976) 129-145*
- Org Met** ATERRADO, E. D. and ABAD, R. G. rat damage assessment and control studies in coconut ii. comparative effects of brodifacoum wax blocks and two bait formulations of zinc phosphide

rodenticide against rats attacking coconuts. *PHILIPP J COCONUT STUD*; 12 (1). 1987. 7-13.

- Abstract** Atkins, H. L. and Som, P. effect of growth hormone on pancreas uptake of selenium-75 selenomethionine. *J NUCL MED. Journal of Nuclear Medicine*. 19 (6). 1978 678
- Rev** Atkins, H. L. and Yano, Y. pancreas uptake of zinc thioglucose (in mice and rats, effects of somatostatin and porcine growth hormone). *International Journal Of Nuclear Medicine And Biology*. 1979. v. 6 (1) p. 54-57. ill.
- Nut def** Atkinson, J., Vohra, P., and Kratzer, F. H. effect of available dietary zinc on the utilization of protein by the chick and japanese quail. *Brit. J. Nutr.* (1972) 27(3): 461-6.
- Unrel** Atkinson, M. A., Maclaren, N. K., and Luchetta, R. 1990. insulinitis and diabetes in nod mice reduced by prophylactic insulin therapy. *Diabetes* 39(8): 933-7.
- CP** Atkinson, S. A., Ward, W., Wang, Z., and Lonnerdal, B. 1993. ontogeny of mucosal uptake mechanisms and tissue compartmentalization of zinc and copper in piglets. *FASEB Journal* 7(3-4): A299.
- No COC** Atteh, J. O. and Leeson, S. 1983. effects of excess dietary calcium, magnesium and phosphorus on performance and mineral metabolism of broiler chicks. *Nutrition Reports International* 28(3): 671-685.
- Nut def** | AU-Freising-Weihenstephan, German Federal Republic. 1978. homeostasis of zn metabolism in experimentally induced zn deficiency dairy cows. <Document Title>Trace Element Metabolism in Man and Animals - 3. 116-121.
- No Oral** AU-German Federal Republic. 1978. a new method for estimation of zn and cu status by chelating agents. *Trace Element Metabolism in Man and Animals - 3.* | . 456-459.
- No Tox** Auer, D. E., Seawright, A. A., and Ng, J. C. 1988. assessment of copper and zinc status of farm horses and training thoroughbreds in south-east queensland. *Australian Veterinary Journal* 65(10): 317-320.
- FL** Auge, M., Kreiling, R., Harzer, G., Daniel, H., and Rehner, G. 1986. effect of proteins on availability of zinc. ii. bioavailability of zinc from casein and whey protein--retention study in young rats. *Zeitschrift Fur Ernährungswissenschaft* 25(4): 233-41.
- FL** Auge, Mechthild, Kreiling, R., Harzer, G., Daniel, Hannelore, and Rehner, Gertrud. effect of proteins on availability of zinc. ii. bioavailability of zinc from casein and whey protein - retention study in young rats. *Z. Ernährungswiss.* (1986) 25(4): 233-41.
- In Vit** Aughey, E. 1973. the ultrastructure of the prostate gland in the cat. *Journal of Reproduction and Fertility* 33(2): 351-2.
- CP** Aughey, E., Fell, G. S., and Scott, R. pre-treatment with zinc delays the onset of cadmium induced nephropathy in the rat. *Trace Elem. Man Anim. 7: Monogr. Proc., Round Tables Discuss. Int. Symp., 7th* : Meeting Date 1990, 11-11-11/12. Editor(s): Momcilovic, Berislav. Publisher: Inst. Med. Res. Occup. Health Univ. Zagreb, Zagreb, Yugoslavia..
- CP** Auld, D. S., Kawaguchi, H., Livingston, D. M., and Vallee, B. L. rna-dependent dna polymerase (reverse transcriptase) from avian myeloblastosis virus, a zinc metalloenzyme. *Proc. Nat. Acad. Sci. U. S. A.* (1974) 71(5): 2091-5.
- No Oral** Aune, T., Ramstad, H., Heidenreich, B., Landsverk, T., Waaler, T., Egaas, E., and Julshamn, K.

1998. zinc accumulation in oysters giving mouse deaths in paralytic shellfish poisoning bioassay .
Vol. 17, No. 4 Journal Of Shellfish Research

- No COC** Austen, M., Luscher, B., and Luscher-Firzlaff, J. M. 1997. characterization of the transcriptional regulator yy1. the bipartite transactivation domain is independent of interaction with the tata box-binding protein, transcription factor iib, tafii55, or camp-responsive element-binding protein (cpb)-binding protein. *Journal of Biological Chemistry* 272(3): 1709-17.
- FL** Avdonin, B. F., Dogadaeva, I. V., and Petrukhin, I. V. 1972. zinc requirement of broilers. *Mater. Vses. Nauch. Soveshch. Konf. Vses. Nauch.-Issled. Tekhnol. Inst. Ptitsevod.* (No. 5): , 202-7.
- No Tox** Aver, D. E., Ng, J. C., Steele, D. P., and Seawright, A. A. Queensland Univ. St Lucia Australia Dept. of Veterinary Pathology. 1988. monthly variation in the plasma copper and zinc concentration of pregnant and non-pregnant mares [horses]. *Australian Veterinary Journal.* V. 65(2) P. 61-62
- Nut def** Avery, R. A. and Bettger, W. J. 1991. effect of dietary zn deficiency on 2,3-diphosphoglycerate and adenosine triphosphate concentrations in the rat erythrocyte. *The Journal Of Nutritional Biochemistry.* 2(7): 395-398.
- Nut def** Avery, Ross A. and Bettger, William J. effect of dietary zinc deficiency and the associated drop in voluntary food intake on rat erythrocyte membrane polyamines. *J. Nutr.* (1988) 118(8): 987-94.
- Nut def** Avery, Ross A. and Bettger, William J. effect of dietary zinc deficiency on 2,3-diphosphoglycerate and adenosine triphosphate concentrations in the rat erythrocyte. *J. Nutr. Biochem.* (1991) 2(7): 395-8.
- Nut def** Avery, Ross A. and Bettger, William J. zinc deficiency alters the protein composition of the membrane skeleton but not the extractability or oligomeric form of spectrin in rat erythrocyte membranes. *J. Nutr.* (1992) 122(3): 428-34.
- Nut def** Avery, Ross Andrew. 1991. the effect of dietary zinc deficiency on polyamines, polyphosphates and membrane skeleton proteins in the rat erythrocyte. *Avail.: NLC Order No. DANN67919 From: Diss. Abstr. Int. B* 1992. 53. 2. 621. 157 pp.
- No COC** Aviv, R., Gurbanov, K., Hoffman, A., Blumberg, S., and Winaver, J. 1995. urinary neutral endopeptidase 24.11 activity: modulation by chronic salt loading. *Kidney International* 47(3): 855-60.
- Phys** Ayala, F. J. 1989. *Genetic Variation in Resistance to Ionizing Radiation.* (Annual Report, 1989). <NOTE> Progress Rept. DOE/ER/60713-T3
- Nut def** Ayala, S. and Brenner, R. R. 1987. [effect of zinc deficiency on the in vivo biosynthesis of fatty acids of the linoleic series in the rat]. <original> efecto de la carencia de zinc sobre la biosintesis in vivo de los acidos grasos de la serie linoleica en la rata. *Acta Physiologica Et Pharmacologica Latinoamericana* 37(3): 321-30.
- Nut def** Ayala, S. and Brenner, R. R. effect of zinc deficiency on the in-vivo synthesis of fatty acids of linoleic acid series in the rat. *Acta Physiologica Et Pharmacologica Latinoamericana.* 37 (3). 1987. 321-330.
- Nut def** Ayala, S. and Brenner, R. R. 1983. essential fatty acid status in zinc deficiency. effect on lipid and fatty acid composition, desaturation activity and structure of microsomal membranes of rat

liver and testes. *Acta Physiologica Latinoamericana*. 33 (3): 3-204.

- Nut def** Ayala, Sixta and Brenner, Rodolfo R. effect of zinc deficiency on the in-vivo biosynthesis of fatty acids of the linoleic acid series in the rat. *Acta Physiol. Pharmacol. Latinoam.* (1987) 37(3): 321-30
- Diss** Aycocho, I. O. 1989. growth and reproductive performance of goats fed rice forage. *66 Leaves*
- FL** Ayyat, M. S., Gabr, H. A., Marai, I. F. M., Abdel-Monem, U. M., <Editors> Marai, I. F. M., El-Gaafary, M. N., Tawfeek, M. I., and El-Rajim, M. I. 1997. alleviation of heat-stressed growing rabbits by using some chemical growth enhancers, under subtropical egyptian conditions. <document title>international conference on animal, poultry & rabbit production and health, egyptian international centre for agriculture, dokki, cairo, egypt 2-4 september, 1997. 637-651.
- Nut def** Aziz, M. T. A., Fahmy, K., Tharwat, S., Elharrizi, W. M., Salama, M., and Ibrahim, H. A. 1985. relationship between zinc deficiency and immunity in bilharzial hepatic fibrosis. *Nutrition Reports International* 32(5): 1221-1227.
- IMM** Aziz, M. T. A., Khalil, A. M., El-Harrizi, W. M., and Aziz, A. A. 1986. zinc, a prophylactic measure against bilharziasis. *Nutrition Reports International* 34(2): 255-261.
- Alt** Aziz, M. T. A., Tawadrous, G. A., Elharrizi, W. M., Atta, H. M., Elraziky, E., Khalil, A. M., and Darwish, A. H. 1988. effect of different levels of excess dietary zinc on bilharzial hepatic fibrosis. *Nutrition Reports International* 37(2): 319-334.
- Alt** Aziz, Mohamed T. Adbel, Ghaffar, Yassin A., Miligy, Dawlat A. El, Mahfouz, Soheir, Aziz, Hanan Abdel, and Kamel, Alyat. the effect of oral zinc intake on collagenase activity in different stages of bilharziasis infested hamsters. *Egypt. J. Biochem.* (1994) 12(1&2): 109-20.
- Unrel** Azuma, Y., Nishiguchi, M., Tagami, H., Ogita, K., and Yoneda, Y. 1998. possible in vivo crosstalk between transcription factors with zinc-finger and leucine-zipper motifs in murine peripheral but not central excitable tissues. *Neurochemistry International* 32(4): 325-36.
- Rev** B., Hardin. 1980. vitamin b sub(6) enhances zinc absorption. *AGRIC. RES* VOL. 29, NO. 6: p. 9.
- In Vit** Baba, A., Kihara, T., Sawada, T., and Iwata, H. 1989. excitatory amino-acids enhance dissociation of zinc from soluble-protein in cytosol of rat hippocampus. *Brain Research* 486(2): 372-375.
- Bact** Baba, E., Fuller, A. L., Gilbert, J. M., Thayer, S. G., and McDougald, L. R. 1992. effect of eimeria brunetti infection and dietary zinc on experimental induction of necrotic enteritis in broiler chickens. *Avian Diseases*. 36(1): 59-62.
- FL** Babenko, G. A. and Zaviiskii, I. u. M. 1988. [effect of exogenous zinc deficiency on the duration of skin graft functioning]. <original> vliianie ekzogennogo defitsita tsinka na dlitel'nost' funktsionirovaniia transplantatov kozhi. *Voprosy Pitaniia* (2): 48-51.
- Unrel** Babiker, B. A., Ahmed, F. A., and Elhag, H. M. A. the effect of natural and artificial colostrum feeding systems on the immune globulin concentration in the blood of crossbred kenana x friesland calves. *Acta Veterinaria (Belgrade)*. 38 (4). 1988. 189-194.
- FL** Babin, Ya. A., Vasyunin, V. V., and Latyshev, V. I. 1975. effect of cobalt, iodine, and zinc salts on oxidative phosphorylation in chick tissues. *Biol. Akt. Veshchestva (Mikroelem. Vitam. Drugie) Rastenievod., Zhivotnovod. Med.* 45-8. Editor(s): Babin, Ya. A. Publisher: Sarat. S-kh.

Inst., Saratov, USSR..

- Nut def** Babu, U. and Failla, M. L. 1990. copper status and function of neutrophils are reversibly depressed in marginally and severely copper-deficient rats. *Journal of Nutrition* 120(12): 1700-1709.
- No Oral** Babu, U. and Failla, M. L. 1990. respiratory burst and candidacidal activity of peritoneal macrophages are impaired in copper-deficient rats. *Journal of Nutrition* 120(12): 1692-1699.
- Nut** Babu Uma S(A), Mitchell Geraldine V, Wiesenfeld Paddy, Jenkins Mamie Y, and Gowda Hemavathi. 2000. nutritional and hematological impact of dietary flaxseed and defatted flaxseed meal in rats. *International Journal of Food Sciences and Nutrition* 51(2): 109-117.
- Unrel** Babu, Y. H. 1987. study on avian monocytosis in poultry-haematology and therapeutic trial. *Poultry Adviser* 20(6): 45-47.
- Gene** Bach, I., Rodriguez Esteban, C., Carriere, C., Bhushan, A., Krones, A., Rose, D. W., Glass, C. K., Andersen, B., Belmonte, J. C. I., and Rosenfeld, M. G. 1999. rlim inhibits functional activity of lim homeodomain transcription factors via recruitment of the histone deacetylase complex. *Vol. 22, No. 4, Pp. 394-399 Nature Genetics*
- Unrel** Back Carita J, Sistonen Lea, Enkvist, M. O. Kristian, Heikkila Jari E, and Akerman Karl E O(A). 1993. calcium and zinc dependence of dna synthesis in untransformed and in ha-ras-val-12-expressing nih 3t3 cells. *Experimental Cell Research* 208(1): 303-310.
- FL** Badawy, Y. H. Zagazig Univ. Egypt Faculty of Veterinary Medicine, Abdo, A. M., Gballab, A. M., El-Keshwy, A., Saad, M. F., and Khaled, F. 1988. effect of zinc deficiency on rat skin [egypt]. *Zagazig Veterinary Journal. V. 16(2) P. 62-88*
- FL** Badawy, Y. H. Zagazig Univ. Egypt Faculty of Veterinary Medicine, Gallab, A. M., Abdou, M. E. B., El-Keshawy, A. H., Saad, M. F., and Enan, H. H. 1988. the effect of zinc deficiency on the eye, histological and histochemical study [egypt]. *Zagazig Veterinary Journal. V. 16(2) P. 1-31*
- CP** Badescu, M., Colev, V., Paduraru, I., Ciocoiu, M., Rosca, M., and Badescu, V. 1995. metabolic disturbances and effect of zinc administration in diabetic rats. *Pfluegers Archiv European Journal of Physiology* 430(4 SUPPL.): R149.
- CP** Baekey, P., Baig, M. M., Burgin, C. W., and Cerda, J. J. effect of pectin on zinc and calcium absorption and turnover in rat. *MEETING OF THE AMERICAN SOCIETY FOR CLINICAL NUTRITION, INC., CLINICAL DIVISION OF THE AMERICAN INSTITUTE OF NUTRITION, SAN FRANCISCO, CALIF., USA, APRIL 24-27, 1981. CLIN RES. 29 (2). 1981. 621a.*
- Mix** Baekey, Paul, Cerda, James J., Baig, M. M., Guild, Ralph, Burgin, Charles W., and Robbins, Frank L. effect of citrus pectin on calcium and zinc balance, absorption, and half-life. *Nutr. Int. (1986) 2(2): 108-14 .*
- Alt** Bafundo, K. W., Baker, D. H., and Fitzgerald, P. R. 1984. eimeria acervulina infection and the zinc-cadmium interrelationship in the chick. *Poultry Science* 63(9): 1828-32.
- Nut** Bafundo, K. W., Baker, D. H., and Fitzgerald, P. R. 1984. zinc utilization in the chick as influenced by dietary concentrations of calcium and phytate and by eimeria acervulina infection. *Poult. Sci.* 63(12): 2430-7.
- Diss** Bafundo, Kenneth William. 1984. trace element interrelationships and zinc status of the chicken as affected by eimeria acervulina infection. *Avail.: Univ. Microfilms Int. Order No. DA8422012*

From: *Diss. Abstr. Int. B* 1985, 45. 7. 2066. Unavailable. 106 p.

- No Oral** Bagchi, Debasis, Vuchetich, Philip J., Bagchi, Manashi, Tran, Minh X., Krohn, Roger L., Ray, Sidhartha D., and Stohs, Sidney J. protective effects of zinc salts on tpa-induced hepatic and brain lipid peroxidation, glutathione depletion, dna damage and peritoneal macrophage activation in mice. *Gen. Pharmacol.* (1998) 30(1): 43-50.
- Nut** Baghel, R. P. S. and Pradhan, K. 1990. effect of age and season on retention of nutrients in broilers. *Indian Veterinary Journal* 67(8): 724-728.
- Nut** Bagheri, S. and Gueguen, L. 1985. effect of wheat bran and pectin on the absorption and retention of phosphorus, calcium, magnesium and zinc by the growing pig. *Reproduction, Nutrition, Developpement* 25(4A): 705-716.
- Nut** Bagheri, S. M. and Gueguen, L. bioavailability to rats of calcium, magnesium, phosphorus and zinc in wheat bran diets containing equal amounts of these minerals. *Nutr. Rep. Int.* (1982) 25(3): 583-9.
- Mix** Bagheri, S. M. and Gueguen, L. 1982. effects of wheat bran on the metabolism of calcium-45 and zinc-65 in rats. *Journal of Nutrition* 112(11): 2047-51.
- Nut** Bagheri, S. M. and Gueguen, L. 1981. influence of wheat bran diets containing unequal amounts of calcium, magnesium, phosphorus and zinc upon the absorption of these minerals in rats. *Nutrition Reports International*. 24 (1): 47-56.
- Mix** Bagheri, Seyed M. and Gueguen, Leon. effects of wheat bran on the metabolism of calcium-45 and zinc-65 in rats. *J. Nutr.* (1982) 112(11): 2047-51.
- Carcin** BAHNEMANN, R., LEIBOLD, E., KITTEL, B., MELLERT, W., and JAECKH, R. different patterns of kidney toxicity after subacute administration of na-nitritotriacetic acid and fe-nitritotriacetic acid to wistar rats. *TOXICOLOGICAL SCIENCES*; 46 (1). 1998. 166-175.
- Unrel** Bahring, R., Standhardt, H., Martelli, E. A., and Grantyn, R. 1994. gaba-activated chloride currents of postnatal mouse retinal ganglion cells are blocked by acetylcholine and acetylcarnitine: how specific are ion channels in immature neurons? *European Journal of Neuroscience* 6(7): 1089-99.
- Nut def** Bahuguna, Archana and Bedwal, R. S. effect of zinc deficiency on boundary layers of seminiferous tubules of testes of wistar albino rat. *Curr. Sci.* (1998) 75(6): 611-617.
- No COC** Bai, Yisheng and Hunt, Curtiss D. dietary boron enhances efficacy of cholecalciferol in broiler chicks. *J. Trace Elem. Exp. Med.* (1996) 9(3): 117-132.
- Plant** Baig, M. A. H. and Bhatti, I. M. 1986. optimizing paddy yield in sind. *Progressive Farming* 6(1): 31-33.
- Aquatic** Bailey Howard C. 1993. acute and chronic toxicity of the rice herbicides thiobencarb and molinate to opossum shrimp (neomysis mercedis). *Marine Environmental Research* 36(4): 197-215.
- Abstract** Bailey, J. D(A), Ansotegui, R. P(A), Paterson, J. A(A), Berardinelli, J. G(A), and Johnson, A. B. 1999. effects of supplemental trace mineral form on trace mineral status and performance of beef heifers. *Journal of Animal Science* 77(SUPPL. 1): 96.
- No COC** Bailey, K. J. and Stephens, D. B. 1985. effects of vibration and noise on plasma acth and zinc

levels and on reproductive-performance in the guinea-pig. *Applied Animal Behaviour Science* 14: 386-387.

- No Tox** Bailey, K. J., Stephens, D. B., and Delaney, C. E. observations on the effects of vibration and noise on plasma acth and zinc levels, pregnancy and respiration rate in the guinea pig. *Lab. Anim.* (1986) 20(2): 101-8 .
- Abstract** Bakalli, R. I. and Pesti, G. M. 1997. influence of high dietary supplementation of cu, fe, zn, ni, mn and mg on delta-aminolevulinic acid dehydratase activity in domestic chickens. *FASEB Journal* 11(3): A588.
- Rev** Baker, D. H., Ammerman, C. B., <Editors> Ammerman, C. B., Baker, D. H., and Lewis, A. J. 1995. zinc bioavailability. <Book> *Bioavailability of Nutrients for Animals: Amino Acids, Minerals, and Vitamins*. 367-398.
- Abstract** Baker, D. H., Kleiss, A. J., Harmon, B. G., and Jensen, A. H. levels of dietary zinc for pregnant gilts. *Journal of Animal Science*. 35 (5). 1972 1101
- HHE** Baker, Dale E. and Bowers, Mark E. human health effects of cadmium predicted from growth and composition of lettuce in gardens contaminated by emissions from zinc smelters. *Trace Subst. Environ. Health* (1989) : 22, 281-95.
- Nut def** Baker, David H., Edwards, Hardy M. III, Strunk, Colleen S., Emmert, Jason L., Peter, Christopher M., Mavromichalis, Ioannis, and Parr, Theresa M. single versus multiple deficiencies of methionine, zinc, riboflavin, vitamin b-6 and choline elicit surprising growth responses in young chicks. *J. Nutr.* (1999) 129(12): 2239-2245.
- Nut def** Baker, G. W. and Duncan, J. R. 1983. possible site of zinc control of hepatoma cell division in wistar rats. *Journal of the National Cancer Institute* 70(2): 333-6.
- Carcin** Baker, Gregory W. and Duncan, John R. 1983. possible site of zinc control of hepatoma cell division in wistar rats. *J. Natl. Cancer Inst.* 70(2): 333-6 .
- Unrel** Baker, H., Morel, K., Stone, D. M., and Maruniak, J. A. 1993. adult naris closure profoundly reduces tyrosine hydroxylase expression in mouse olfactory bulb. *Brain Research* 614(1-2): 109-16.
- No Oral** Baker, H., Towle, A. C., and Margolis, F. L. 1988. differential afferent regulation of dopaminergic and gabaergic neurons in the mouse main olfactory bulb. *Brain Research* 450(1-2): 69-80.
- In Vit** Baker, T. S. and Amos, L. A. structure of the tubulin dimer in zinc induced sheets. *Journal of Molecular Biology*. 123 (1). 1978. 89-106.
- Mix** Bakheit, H. A. and Greene, H. J. 1981. control of bovine neonatal diarrhoea by management techniques. *Veterinary Record* 108(21): 455-458.
- Unrel** Bakhiet, A. O. and Adam, S. E. 1995. an estimation of citrullus colocynthis toxicity for chicks. *Veterinary and Human Toxicology* 37(4): 356-8.
- In Vit** Bakka, A. and Webb, M. metabolism of zinc and copper in the neonate: changes in the concentrations and contents of thionein-bound zinc and copper with age in the livers of the newborn of various mammalian species. *Biochem. Pharmacol.* (1981) 30(7): 721-5 .
- FL** BAKOS, A. and TOCKA, I. the effect of grains poisoned with "nera" on coturnix c. japonica

under laboratory conditions.). *POL'NOHOSPODARSTVO*; 15 (11). 1969 987-991

- Nut** Balakhontseva, V., Dubinskaya, A., and Rozhkova, M. 1986. products of microbiological synthesis - paprin. *Mukomol'No-Elevatornaya i Kombikormovaya Promyshlennost'* (10): 41-42.
- Bio Acc** Balakrishnan, V. and Balagopal, R. 1994. serum calcium, phosphorus, magnesium, copper and zinc level in regularbreeding buffaloes. *Indian Veterinary Journal* 71(1): 23-25.
- HHE** Balbin Milagros, Fueyo Antonio, Knauper Vera, Pendas Alberto M, Lopez Jose M, Jimenez Maria G, Murphy Gillian, and Lopez-Otin Carlos(A). 1998. collagenase 2 (mmp-8) expression in murine tissue-remodeling processes: analysis of its potential role in postpartum involution of the uterus. *Journal of Biological Chemistry* 273(37): 23959-23968.
- HHE** Bales, C. W., Steinman, L. C., Freelandgraves, J. H., Stone, J. M., and Young, R. K. 1986. the effect of age on plasma zinc uptake and taste acuity. *American Journal Of Clinical Nutrition* 44(5): 664-669.
- Nut def** Bales, C. W., Wang, M. C., Freelandgraves, J. H., and Pobocik, R. S. 1986. the effect of zinc-deficiency and food restriction on prostaglandin-e2 and thromboxane-b2 in saliva and plasma of rats. *Prostaglandins* 31(5): 859-868.
- Plant** Baligar, V. C., Wright, R. J., Bennett, O. L., Hern, J. L., Perry, H. D., and Smedley, M. D. 1985. lime effect on forage legume growth and mineral composition in an acid subsoil. *Communications in Soil Science and Plant Analysis* 16(10): 1079-1093.
- Plant** Baligar, V. C., Wright, R. J., Fageria, N. K., and Foy, C. D. differential responses of forage legumes to aluminum. *J. Plant Nutr. (1988)* 11(5): 549-61
- Gene** Ball, G. F., Tlemcani, O., and Balthazart, J. 1997. induction of the zenk protein after sexual interactions in male japanese quail. *Neuroreport* 8(13): 2965-70.
- Nut** Ballam, G. C., Nelson, T. S., and Kirby, L. K. 1984. the effect of phytate and fiber source on phytate hydrolysis and mineral availability in rats. *Nutrition Reports International* 30(5): 1089-1100.
- Nut** Ballam, Gordon C., Nelson, Talmadge S., and Kirby, Linda K. the effect of phytate and fiber source on phytate hydrolysis and mineral availability in rats. *Nutr. Rep. Int. (1984)* 30(5): 1089-100.
- FL** Ballarini, G. Parma Univ. Italy Istituto di Clinica Medica Veterinaria. 1990. [nutrition and immunity]. <original> nutrizione e immunita. *Obiettivi e Documenti Veterinari. V. 11(2) P. 31-42*
- FL** Ballarini, G. Parma Univ. Italy Istituto di Clinica Medica Veterinaria. 1990. [nutrition - immunity and conditioned pathology of pig]. <original> nutrizione - immunita e patologia condizionata del maiale. *Rivista Di Suinicoltura. V. 31(9) P. 91-102*
- Unrel** Balnave, D. 1993. influence of saline drinking water on eggshell quality and formation. *World's Poultry Science Journal* 49(2): 109-119.
- No COC** Balnave, D. and Muheereza, S. K. 1997. improving eggshell quality at high temperatures with dietary sodium bicarbonate. *Poultry Science* 76(4): 588-593.
- Mix** Balnave, D. and Zhang, D. 1993. responses of laying hens on saline drinking water to dietary supplementation with various zinc compounds. *Poult. Sci.* 72(3): 603-6 .

- Chem Meth** BaLuk, P. and Gabella, G. 1987. fine structure of the autonomic ganglia of the mouse pulmonary vein. *Journal of Neurocytology* 16(2): 169-84.
- Prim** Baly, D. L., Golub, M. S., Gershwin, M. E., and Hurley, L. S. studies of marginal zinc deprivation in rhesus monkeys. iii. effects on vitamin a metabolism (retinol-binding protein). *American Journal Of Clinical Nutrition*. Aug 1984. v. 40 (2) p. 199-207. ill.
- Prim** Baly, Deborah L., Golub, Mari S., Gershwin, M. Eric, and Hurley, Lucille S. studies of marginal zinc deprivation in rhesus monkeys . iii. effects on vitamin a metabolism. *Am. J. Clin. Nutr.* (1984) 40(2): 199-207.
- BioX** Bamberger, David M., Herndon, Betty L., and Suvana, Padma R. the effect of zinc on microbial growth and bacterial killing by cefazolin in a staphylococcus aureus abscess milieu. *J. Infect. Dis.* (1993) 168(4): 893-6.
- Unrel** Banci, L., Schroder, S., and Kollman, P. A. molecular dynamics characterization of the active cavity of carboxypeptidase a and some of its inhibitor adducts. *Proteins Structure Function and Genetics*. 13 (4). 1992. 288-305.
- Drug** Bandwar, Rajiv P., Flora, Swaran J. S., and Rao, Chebrolu P. influence of zinc-saccharide complexes on some hematological parameters in rats. *BioMetals* (1997) 10(4): 337-341
- No Dose** Bandwar, Rajiv P., Giralt, Mercedes, Hidalgo, Juan, and Rao, Chebrolu P. metal-saccharide chemistry and biology: saccharide complexes of zinc and their effect on metallothionein synthesis in mice. *Carbohydr. Res.* (1996) 284(1): 73-84.
- Alt** Banerjee, Pradeep K., Olsen, Richard W., and Snead, O. Carter III. zinc inhibition of .gamma.-aminobutyric acid receptor function is decreased in the cerebral cortex during pilocarpine-induced status epilepticus. *J. Pharmacol. Exp. Ther.* (1999) 291(1): 361-366
- Abstract** Bankson, S. M., Bankson, D. D., Verdon, C. P., and Russell, R. M. dietary zinc deficiency produces electro retinogram abnormalities without depleting total ocular zinc. *68TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 1-6, 1984 FED PROC.* 43 (3). 1984. Abstract 2343.
- Unrel** Baozhen, Wang. 1987. the development of ecological wastewater treatment and utilization systems (ewtus) in china. *Water Sci. Technol.* (1987) 19(1-2, Water Pollut. Res. Control, Rio de Janeiro, 1986, Pt. 1): 51-63 .
- HHE** Bara, M., Guetbara, A., and Durlach, J. 1988. study of the antagonism between zinc and various embryonic toxics on human amnion permeability .1. zinc and cadmium. *Journal Of Trace Elements And Electrolytes In Health And Disease* 2(2): 111-115.
- Alt** Barakat, M. M. A., Motawi, T. M. K., and El-Aaser, A. A. possible role of zinc supplement on lipid metabolism in alloxan diabetic rats fed with soybean. *Bull. Fac. Pharm. (Cairo Univ.)* (1989) 27(1): 4-6 .
- Alt** Barakat, M. M. A., Motawi, T. M. K., El-Aser, A. A., and Osman, A. M. effect of soybean feeding with and without zinc supplement on carbohydrate metabolism in alloxan-diabetic rats. *Bull. Fac. Pharm. (Cairo Univ.)* (1989) 27(1): 1-3 .
- No Dose** Baraldi, M., Caselgrandi, E., Borella, P., and Zeneroli, M. L. 1983. decrease of brain zinc in experimental hepatic encephalopathy. *Vol. 258, No. 1, Pp. 170-172* Brain Res.
- Abstract** Baraldi, M., Caselgrandi, E., and Santi, M. reduction of withdrawal symptoms in morphine-

dependent rats by zinc behavioral and biochemical studies. *8TH EUROPEAN NEUROSCIENCE CONGRESS, THE HAGUE, NETHERLANDS, SEPT. 11-15, 1984. NEUROSCI LETT. 0 (Suppl. 18). 1984. S371.*

- No COC** Baraldi, Mario, Zanolì, Paola, Rossi, Tiziana, Borelaa, Paola, Caselgrandi, Eva, and Petraglia, Felice. neurobehavioral and neurochemical abnormalities of pre- and postnatally lead-exposed rats : zinc, copper and calcium status. *Neurobehav. Toxicol. Teratol.* (1985) 7(5): 499-509 .
- Mineral** Baranow-Baranowski, S. and Klata, W. 1998. influence of dietary mineral contents (ca, p, mg, cu, zn and co) on their concentration in serum and milk in dairy cattle. *Magazyn Weterynaryjny* 7(3): 198-201.
- Unrel** Baratieri, A., Miani, C., and Picarelli, A. 1970. [localization of zinc in the dental tissues during the development of the rat]. <original> localisations du zinc dans les tissus dentaires en voie de développement du rat. *Bulletin Du Groupement International Pour La Recherche Scientifique En*
- No Oral** Barbour, E. K(A), Hamadeh, S. K., Ghanem, D. Abi, Haddad, J. J., and Safieh-Garabedian, B. 1998. humoral and cell-mediated immunopotential in vaccinated chicken layers by thymic hormones and zinc. *Vaccine* 16(17): 1650-1655.
- CP** Barch, D. H. and Fox, C. C. 1987. dietary zinc-deficiency increases the formation of methylbenzyl nitrosamine induced o-6-methylguanine in the rat esophagus. *Proceedings Of The American Association Of Cancer Research 1987, V28, Mar, P118*
- Nut def** Barch, D. H. and Fox, C. C. 1987. dietary zinc-deficiency increases the methylbenzyl nitrosamine-induced formation of o-6-methylguanine in the esophageal dna of the rat. *Carcinogenesis* 8(10): 1461-1464.
- Nut def** Barch, D. H., Fox, C. C., and Bennett, B. T. a simple system of feeding bottles for the study of zinc deficiency and ethanol consumption in the rat. *Laboratory Animal Science.* Aug 1987. v. 37 (4) p. 504-506. ill.
- Nut def** Barch, D. H., Kuemmerle, S. C., Hollenberg, P. F., and Iannaccone, P. M. 1984. esophageal microsomal metabolism of n-nitrosomethylbenzylamine in the zinc-deficient rat. *Cancer Research* 44(12, I): 5629-5633.
- Nut def** Barch, David H., Kuemmerle, Steven C., Hollenberg, Paul F., and Iannaccone, Philip M. esophageal microsomal metabolism of n-nitrosomethylbenzylamine in the zinc-deficient rat. *Cancer Res.* (1984) 44(12, Pt. 1): 5629-33.
- FL** Bardoni, R. and Belluzzi, O. 1993. [modulating action of extracellular zinc on transient potassium currents in cerebellar granule cells in the rat]. <original> azione modulatrice dello zinco extracellulare sulla corrente potassio transiente in cellule dei granuli del cervelletto di ratto. *Bollettino Della Societa Italiana Di Biologia Sperimentale* 69(4)
- In Vit** Bardoni, Rita and Belluzzi, Ottorino. modifications of a-current kinetics in mammalian central neurones induced by extracellular zinc. *J. Physiol. (London)* (1994) 479(3): 389-400 .
- Phys** Barelli, H., Vincent, J. P., and Checler, F. 1988. peripheral inactivation of neurotensin. isolation and characterization of a metallopeptidase from rat ileum. *European Journal of Biochemistry* 175(3): 481-9.
- Gene** Barembaum, M. and Bronner-Fraser, M. 1994. a newly isolated quail zinc finger gene expressed in the dorsal neural tube. *Molecular Biology of the Cell* 5(SUPPL.): 230A.

- Gene** Barembaum, M. and Bronner-Fraser, M. 1998. znf 6, a quail zinc finger gene expressed in ectoderm and ectoderm derived tissues. *Developmental Biology*. 198(1): 173.
- FL** Barge, M. T. and Mazzocco, P. the functional activity of zinc in the feeding of ruminants of economic importance 2. experimental deficiency in full grown ewes. *Zeitschrift Fuer Tierphysiologie Tierernaehrung Und Futtermittelkunde*. 48 (1-2). 1982. 36-46.
- FL** Barge, M. T. and Mazzocco, P. 1982. the functional activity of zinc in the feeding of ruminants of economic importance. 2. experimental deficiency by full-grown ewes. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde* 48(1/2): 36-46.
- Gene** Barkats, M., Nakao, N., Grasbon-Frodl, E. M., Bilanz-Bleuel, A., Revah, F., Mallet, J., and Brundin, P. 1997. intrastriatal grafts of embryonic mesencephalic rat neurons genetically modified using an adenovirus encoding human cu/zn superoxide dismutase. *Neuroscience* 78(3): 703-13.
- Unrel** Barker, B. C. and Lockett, B. C. 1971. endodontic experiments with resorbable paste. *Australian Dental Journal* 16(6): 364-72.
- Unrel** Barker, J. C. and Zublena, J. P. livestock manure nutrient assessment in north carolina. *Int. Symp. Agric. Food Process. Wastes Proc.*, 7th (1995): 98-106. Editor(s): Ross, Charles C. Publisher: American Society of Agricultural Engineers, St. Joseph, Mich..
- Drug** Barnes, E. M., Impey, C. S., and Stevens, B. J. H. factors affecting the incidence and anti salmonella-typhimurium activity of the anaerobic cecal flora of the young chick. *J HYG. Journal of Hygiene*. 82 (2). 1979. 263-284.
- CP** Barnes, P. M. and Moynahan, E. J. 1973. zinc deficiency in acrodermatitis enteropathica: multiple dietary intolerance treated with synthetic diet. *Proceedings of the Royal Society of Medicine* 66(4): 327-329.
- No Oral** Barnett, S. A., Cowan, P. E., Radford, G. G., and Prakash, I. 1975. peripheral anosmia and the discrimination of poisoned food by rattus rattus l. *Behavioral Biology* 13(2): 183-90.
- CP** Barneveld, A. A. Van PUMTA, Van den Hamer, C. J. A., and Houtman, J. P. W. drinking water hardness, trace elements and cardiovascular diseases: influence of ca (calcium) and mg (magnesium) on metabolism of cd (cadmium), co (cobalt), cu (copper), zn (zinc), and se (selenium) in mice. *Trace Substances In Environmental Health : ; Proceedings Of University Of Missouri's ... Annual Conference*. 1982. 1982. (16) p. 196-204.
- Nut def** Barney, G. H., Orgebin-Crist, M. C., and Macapinalac, M. P. 1968. genesis of esophageal parakeratosis and histologic changes in the testes of the zinc-deficient rat and their reversal by zinc repletion. *Journal of Nutrition* 95(4): 526-34.
- Nut def** Barr, D. H. and Harris, J. W. growth of the p388 leukemia as a ascites tumor in zinc-deficient mice. *Proc. Soc. Exp. Biol. Med. (1973)* 144(1): 284-7.
- Gene** Barrow, L. L., Simin, K., Jones, J. M., Lee, D. C., and Meisler, M. H. 1994. conserved linkage of early growth response 4, annexin 4, and transforming growth factor alpha on mouse chromosome 6. *Genomics* 19(2): 388-90.
- Nut def** Barry-Sterman, M., Shouse, M. N., Fairchild, M. D., and Belsito, O. 1986 . kindled seizure induction alters and is altered by zinc absorption. *Brain Research* 383(1-2): 382-6.
- In Vit** Bartels, P. C., Helleman, P. W., and Soons, J. B. J. 1989. interference of plasma fluorophores on

the red blood-cell zinc protoporphyrin - hemoglobin ratio as determined on a hematofluorimeter. *Annals Of Clinical Biochemistry* 1989, V26, Jul, P368-373

- IMM** Bartlett, J. R(A) and Smith, M. O(A). 1999. effect of dietary zinc on immune response of heat-distressed broilers. *Poultry Science* 78(SUPPL. 1): 39.
- Food** Bartness Timothy J(A) and Clein Marion R. 1994. effects of food deprivation and restriction, and metabolic blockers on food hoarding in siberian hamsters. *American Journal of Physiology* 266(4 PART 2): R1111-R1117.
- Unrel** Bartoli, G. M., Palozza, P., and Piccioni, E. enhanced sensitivity to oxidative stress in copper zinc sod depleted rat erythrocytes. *BIOCHIM BIOPHYS ACTA. Biochimica Et Biophysica Acta.* 1123 (3). 1992. 291-295.
- No Data** Barton, T. L. 1996. relevance of water quality to broiler and turkey performance. *Poultry Science* 75(7): 854-6.
- No COC** Bartov, I. 1994. effect of growth promoters on monensin toxicity in broiler chicks. *British Poultry Science* 35(1): 123-133.
- No COC** Bartov, I. Department of Poultry Science Agricultural Research Organization The Volcani Center P. O. B. 6 Bet Dagan 50250 Israel. 1992. effects of energy concentration and duration of feeding on the response of broiler chicks to growth promoters. *British Poultry Science.* V. 33(5) P. 1057-1068
- FL** Basile, G. and Lucisano, A. 1982. distribution of cadmium, zinc and copper in tissues of chickens given cadmium. *Acta Medica Veterinaria.* 28(1/2): 93-100.
- No Oral** Basinger, M. A. and Jones, M. M. chelate antidotal efficacy in acute zinc intoxication. *Research Communications in Chemical Pathology and Pharmacology.* 33 (2). 1981. 263-272.
- Org Met** BASKARAN, J., KANAKASABAI, R., and NEELANARAYANAN, P. evaluation of two rodenticides in the paddy fields during samba and thaladi seasons. *INDIAN JOURNAL OF EXPERIMENTAL BIOLOGY*; 33 (2). 1995. 113-121.
- No COC** Baskaran, J. Kanakasabai R. and Neelanarayanan P. 1995. evaluation of two rodenticides in the paddy fields during samba and thaladi seasons. *J.Exp.Biol.* 33(2): 113-121.
- FL** Basova, N. A., Berzin', N. I., and Markov, I. u. G. 1999. [the role of zinc in the iliac absorption of various l-tryptophane forms in chickens]. <original> rol' tsinka v protsesse vsasyvaniia razlichnykh form l-triptofana v podvzdoshnoi kishke tsypliat. *Rossiiskii Fiziologicheskii Zhurnal Imeni I.M. Sechenova* 85(2)
- Phys** Bassan, M., Zamostiano, R., Davidson, A., Pinhasov, A., Giladi, E., Perl, O., Bassan, H., Blat, C., Gibney, G., Glazner, G., Brenneman, D. E., and Gozes, I. 1999. complete sequence of a novel protein containing a femtomolar-activity-dependent neuroprotective peptide. *Journal of Neurochemistry* 72(3): 1283-93.
- Dead** Basse, A. 1975. post-mortem findings in calves with the lethal trait a46, in black pied danish cattle of friesland descent. 147-149.
- No COC** Bastian, H. P., Gebhardt, M., and Vahlensieck, W. potential for nucleation as a first step in stone formation. *Fortschr. Urol. Nephrol.* (1977) 9(Pathog. Klin. Harnstein): 86-95 .
- Mix** Bastien, R. W., Bradley, J. W., Pennington, B. L., and Ferguson, T. M. 1979. effect of dietary

mineral supplements on radius breaking strength and egg characteristics of caged layers. *Poultry Science* 58(1): 90-92.

- CP** Bastien, R. W. and Ferguson, T. M. resting white leghorn hens with dietary iron or zinc supplements. *NINTH ANNUAL MEETING OF THE SOUTHERN POULTRY SCIENCE SOCIETY. POULT SCI.* 67 (Suppl. 1). 1988. 3.
- Mix** Bataeva, A. P., Kal'nitskii, B. D., Tsvetkova, N. Ya., Pavlov, V. I., and Stetsenko, I. I. 1980. metabolism and retention of basal major and trace elements in early-weaned pigs. *Nauchnye Trudy, Vsesoyuznyi Nauchno-Issledovatel'skii Institut Fiziologii, Biokhimii i Pitaniya Sel'Skokhozyaistvennykh Zhivotnykh* 24: 139-150.
- CP** Bataineh, Z. M(A), Hailat, N., Al-Alami, J., Lafi, S., and Hani, I. Bani. 1999. ultrastructural morphology of the dorsal lobe of the prostate gland in cadmium-treated and zinc treated rats. *FASEB Journal* 13(4 PART 1): A345.
- CP** Bataineh, Z. M(A) and Heideger, P. M. Jr. 1995. nuclear zinc in the rat prostate gland. *FASEB Journal* 9(3): A546.
- Nut def** Bates, C. J. and Evans, P. H. 1992. incorporation of tritiated proline into collagen and other proteins in rats fed diets with various zinc concentrations. *Journal of Nutrition.* 122(5): 1096-1104.
- Nut def** Bates, Christopher J. and Evans, Peter H. incorporation of [3h]proline into collagen and other proteins in rats fed diets with various zinc concentrations. *J. Nutr. (1992)* 122(5): 1096-104.
- Unrel** Bates, D. G. and Navia, J. M. 1979. chemotherapeutic effect of zinc on streptococcus mutans and rat dental caries. *Archives of Oral Biology* 24(10-11): 799-805.
- No COC** Bates, R. W. and Garrison, M. M. hormonal interactions among growth hormone acth cortisol and dexamethasone upon size of kidney liver and adrenal. *Proceedings of the Society for Experimental Biology and Medicine.* 146 (3). 1974 725-731.
- Abstract** BATEY, R. G. and LANDRIGAN, J. 1987-1988. alcohol and zinc effects on hepatic regeneration. *38TH ANNUAL MEETING OF THE AMERICAN ASSOCIATION FOR THE STUDY OF LIVER DISEASES*
- Unrel** Batra, S., Singh, S. P., Gupta, S., Katiyar, J. C., and Srivastava, V. M. 1990. reactive oxygen intermediates metabolizing enzymes in ancylostoma ceylanicum and nipposstrongylus brasiliensis. *Free Radical Biology & Medicine* 8(3): 271-4.
- FL** Batsford, S., Rohrbach, R., Knoth, J., Vogt, A. , and Kluthe, R. dietary experiments in a defined immunological model (new zealand black/white mouse): effect of increased zinc supply. *Aktuel. Ernahrungsmed. (1983)* 8(6): 250-2 .
- Unrel** Batt, R. M., Carter, M. W., and Peters, T. J. 1984. biochemical changes in the jejunal mucosa of dogs with a naturally occurring enteropathy associated with bacterial overgrowth. *Gut* 25(8): 816-23.
- In Vit** Batt, R. M. and Peters, T. J. 1978. subcellular fractionation studies on peroral jejunal biopsies from the dog. *Research in Veterinary Science* 25(1): 94-100.
- Alt** Batyrbekov, A. A., Rashidova, S. Sh., and Khodzhaev, S. G. 1986. effect of some compounds of cobalt, copper and zinc on the proliferation and differentiation of stem cells in immunodeficient mouse strains. *Med. Zh. Uzb.* (8): 76-8 .

- Unrel** Bauer, R., Brummerstedt, E., Jensen, M., Mejborn, H., and Smith, M. reduced rate of uptake of zinc ions in a calf affected with the lethal syndrome a46 relative to clinically normal calves using whole body radio-isotope scanning of zinc-67. *APMIS (ACTA PATHOL MICROBIOL IMMUNOL SCAND)*. *APMIS (Acta Pathologica Microbiologica Et Immunologica Scandinavica)*. 100 (4). 1992. 347-352.
- Nut def** Bauman, V. K. and Berzin', N. I. 1976. stimulating effect of vitamin a on zinc metabolism and absorption in chickens. *Prikladnaya Biokhimiya i Mikrobiologiya* 12(2): 151-155.
- Nut def** Baustad, B. Norges Veterinaerhoegskole Oslo Norway Inst. for Stordyrskjukdommer, Kaurstad, E., Austboe, D., Aadnoey, T., Lium, B., and Simensen, E. eds. 1998. [zinc deficiency in pigs for slaughter, effect on clinical symptoms, growth and feed consumption]. <original> sinkmangel hos slaktegris, virkning paa kliniske symptomer, tilvekst og forforbruk. [the domestic animal experiment and research meeting, agricultural university of norway 10. and 11. february]. <original> husdyrforsøksmøtet 1998, norges landbrukshoegskole 10. og 11. februar. 709 P. P. 284-288
- Nut** Bauza, R., Barlocco, N., and Cozzolino, D. 1990. use of rice bran in diets for fattening pigs. 1. effect of different levels of inclusion and zinc supplementation. <document title>boletin de investigacion - facultad de agronomia, universidad de la republica. (25): 20 pp.
- FL** Bavel'skii, Z. E., Sarsembaev, M. M., and Trukhanov, N. I. effect of complexing compounds on insulocytes of pancreatic islands. *Fiziol. Zh. (Kiev)* (1982) 28(1): 34-9.
- No Oral** Bawden, J. W. and Hammarstroem, L. E. autoradiography of zinc-65 in developing rat teeth and bones. *Arch. Oral Biol.* (1977) 22(7): 449-54.
- Unrel** Bax, B., Blundell, T. L., Murray-Rust, J., and McDonald, N. Q. 1997. structure of mouse 7s ngf: a complex of nerve growth factor with four binding proteins. *Structure* 5(10): 1275-85.
- In Vit** Bay, B. H(A), Singh, G., and Sit, K. H. 1995. effect of intraperitoneal zinc on the haematological profiles of c57/6j mice. *Singapore Medical Journal* 36(3): 271-272.
- Nut def** Beach, R. S., Gershwin, M. E., and Hurley, L. S. 1982. gestational zinc deprivation in mice: persistence of immunodeficiency for three generations. *Science*. 218 (4571): 469-471.
- Nut def** Beach, R. S., Gershwin, M. E., and Hurley, L. S. 1982. nutritional factors and auto-immunity .2. prolongation of survival in zinc-deprived nzb w mice. *Journal Of Immunology* 128(1): 308-313.
- IMM** Beach, R. S., Gershwin, M. E., and Hurley, L. S. nutritional factors and auto immunity 3. zinc deprivation vs. restricted food intake in mrl-1 mice the distinction between interacting dietary influences. *Journal of Immunology*. 129 (6). 1982. 2686-2692.
- IMM** Beach, R. S., Gershwin, M. E., and Hurley, L. S. 1981. nutritional factors and autoimmunity. i. immunopathology of zinc deprivation in new zealand mice. *Journal of Immunology* 126(5): 1999-2006.
- Nut def** Beach, R. S., Gershwin, M. E., and Hurley, L. S. 1982. nutritional factors and autoimmunity. iii. zinc deprivation versus restricted food intake in mrl/1 mice--the distinction between interacting dietary influences. *Journal of Immunology* 129(6): 2686-92.
- Nut def** Beach, R. S., Gershwin, M. E., and Hurley, L. S. 1983. persistent immunological consequences of gestation zinc deprivation. *American Journal of Clinical Nutrition* 38(4): 579-90.

- Nut def** Beach, R. S., Gershwin, M. E., and Hurley, L. S. 1982. reversibility of development retardation following murine fetal zinc deprivation. *Journal of Nutrition* 112(6): 1169-81.
- Nut def** Beach, R. S., Gershwin, M. E., and Hurley, L. S. 1982. reversibility of developmental retardation following murine fetal zincdeprivation. *Journal of Nutrition* 112(6): 1169-1181.
- Nut def** Beach, R. S., Gershwin, M. E., Makishima, R. K., and Hurley, L. S. 1980. impaired immunologic ontogeny in postnatal zinc deprivation. *Journal of Nutrition* 110(4): 805-15 .
- Nut def** Beach, Richard S., Gershwin, M. Eric, and Hurley, Lucille S. altered thymic structure and mitogen responsiveness in postnatally zinc-deprived mice. *Dev. Comp. Immunol. (1979)* 3(4): 725-38.
- Nut def** Beach, Richard S., Gershwin, M. Eric, and Hurley, Lucille S. dietary zinc modulation of moloney sarcoma virus oncogenesis. *Cancer Res. (1981)* 41(2): 552-9.
- Nut def** Beach, Richard S., Gershwin, M. Eric, and Hurley, Lucille S. 1982. gestational zinc deprivation in mice : persistence of immunodeficiency for three generations. *Science (Washington D. C., 1883-)* 218(4571): 469-71.
- Nut def** Beach, Richard S., Gershwin, M. Eric, and Hurley, Lucille S. growth and development in postnatally zinc-deprived mice. *J. Nutr. (1980)* 110(2): 201-11
- Nut def** Beach, Richard S., Gershwin, M. Eric, and Hurley, Lucille S. nutritional factors and autoimmunity. i. immunopathology of zinc deprivation in new zealand mice. *J. Immunol. (1981)* 126(5): 1999-2006
- Nut def** Beach, Richard S., Gershwin, M. Eric, and Hurley, Lucille S. nutritional factors and autoimmunity. ii. prolongation of survival in zinc-deprived nzb/w mice. *J. Immunol. (1982)* 128(1): 308-13
- Nut def** Beach, Richard S., Gershwin, M. Eric, and Hurley, Lucille S. nutritional factors and autoimmunity. iii. zinc deprivation versus restricted food intake in mrl/1 mice - the distinction between interacting dietary influences. *J. Immunol. (1982)* 129(6): 2686-92 .
- Nut def** Beach, Richard S., Gershwin, M. Eric, and Hurley, Lucille S. persistent immunological consequences of gestation zinc deprivation. *Am. J. Clin. Nutr. (1983)* 38(4): 579-90
- Nut def** Beach, Richard S., Gershwin, M. Eric, and Hurley, Lucille S. reversibility of developmental retardation following murine fetal zinc deprivation. *J. Nutr. (1982)* 112(6): 1169-81
- Nut def** Beach, Richard S., Gershwin, M. Eric, Makishima, Ronald K., and Hurley, Lucille S. impaired immunologic ontogeny in postnatal zinc deprivation. *J. Nutr. (1980)* 110(4): 805-15
- No Dose** Beal, L., Finney, P. L., and Mehta, T. effects of germination and dietary calcium on zinc bioavailability from peas. *J. Food Sci. (1984)* 49(2): 637-41 .
- Alt** Beal, M. F., Ferrante, R. J., Henshaw, R., Matthews, R. T., Chan, P. H., Kowall, N. W., Epstein, C. J., and Schulz, J. B. 1995. 3-nitropropionic acid neurotoxicity is attenuated in copper/zinc superoxide dismutase transgenic mice. *Journal of Neurochemistry* 65(2): 919-22.
- CP** Bean, G. H., Setayesh, M. R., Mendley, S. R., and Lowenstein, L. M. iron metabolism during renal cellular growth. *MEETING OF THE AMERICAN SOCIETY OF NEPHROLOGY, WASHINGTON, D.C., USA, NOV. 22-24, 1981. KIDNEY INT. 21 (1). 1982. 251.*

- No Oral** Bean, N. Jay. 1982. modulation of agonistic behavior by the dual olfactory system in male mice. *Physiology & Behavior*. 29(3): 433-438.
- No COC** Beaton, J. R., Feleki, V., and Stevenson, J. A. F. 1966. *Factors in the Reduced Food Intake of Rats Fed a Low-Protein Diet* : 5p.
- No Oral** Beaton, J. R., Feleki, V., and Stevenson, J. A. F. 1965. *Insulin Hyperphagia in Rats Fed a Lowprotein Diet Canadian Journal of Physiology and Pharmacology* . 43: 225-33.
- Rev** Beattie, John H. and Bremner, Ian. 1998. roles of metallothionein in cellular metabolism. *Met. Ions Biol. Med. Proc. Int. Symp.*, 5th : 117-127. Editor(s): Collery, Phillipe. Publisher: Libbey Eurotext, Montrouge, Fr.
- Abstract** Bebe, F. N. and Panemangalore, M. 1993. effect of low level oral exposure to lead or cadmium in weanling, adult and aged rats fed zinc deficient or high zinc diets. *Journal of Animal Science* 71(SUPPL. 1): 177.
- CP** Bebe, F. N. and Panemangalore, M. growth and feed intake of weanling rats fed varying levels of zinc in the diet and exposed to toxic metals in drinking water. *MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE AND INTERNATIONAL SOCIETY OF APPLIED ETHOLOGY, PITTSBURGH, PENNSYLVANIA, USA, AUGUST 8-11, 1992. J ANIM SCI.* 70 (Suppl. 1). 1992. 233.
- Abstract** Bebe, F. N. and Panemangalore, M. 1994. influence of zinc deficient and high zinc diets, and low oral lead and cadmium exposure on tissue zinc and copper concentrations in weanling rats. *Journal of Animal Science* 72(SUPPL. 2): 7.
- Fate** Bebe, F. N. and Panemangalore, M. 1996. modulation of tissue trace metal concentrations in weanling rats fed different levels of zinc and exposed to oral lead and cadmium. *Nutrition Research*. 16(8): 1369-1380.
- CP** BEBE, F. N. and PANEMANGALORE, M. 1995. zinc deficiency and oral lead and cadmium exposure in weanling rats effects on tissue trace metals and metabolites of heme synthesis. *87TH ANNUAL MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE*
- CP** Bebe, F. N(A), Brunson, A., Deva, R., Rao, D. R., and Panemangalore M(A). 1997. bioavailability of zinc from bread supplemented with zinc oxide in weanling rats. *FASEB Journal* 11(3): A408.
- Diss** Becker, C. 1998. growth of hoof horn, as influenced by various dietary additives and substances applied to the hoof. 96 pp.
- No Oral** Becker, G., Osterloh, K., Schafer, S., Forth, W., Paskins-Hurlburt, A. J., Tanaka, G., and Skoryna, S. C. 1981. influence of fucoidan on the intestinal absorption of iron, cobalt, manganese and zinc in rats. *Digestion* 21(1): 6-12.
- Org Met** Becker, K. and Schultze, G. (report of a trip to denmark for the study of resistance of rats to anticoagulants.). *Prakt. Schaedlingsbekampfer*; 23(7): 101-4 1971; (REF:10)
- Nut def** Becker, Wayne Marvin and Hoekstra, William G. dialysis studies of liver zinc in zinc-deficient and control rats. *J. Nutr.* (1968) 94(4): 455-62.
- Nut def** Becker, Wayne Marvin and Hoekstra, William G. effect of vitamin d on zinc-65 absorption, distribution and turnover in rats. *J. Nutr.* (1966) 90(3): 301-9.

- Gene** Beckmann, A. M., Matsumoto, I., and Wilce, P. A. 1997. ap-1 and egr dna-binding activities are increased in rat brain during ethanol withdrawal. *Journal of Neurochemistry* 69(1): 306-14.
- Drug** Bedi, H. K., Bomb, B. S., Kumawat, D. C., Saifee, A., Surana, S. S., Bedi, T., and Bomb, P. 1981. preventive effect of zinc on cholesterol atherosclerosis in rabbit. *Journal of the Association of Physicians of India* 29(10): 813-7.
- Nut** Bedi, S. P. S. and Sawhney, P. C. 1980. effect of zinc on the haematology of haryana calves. *Indian Journal of Animal Sciences* 50(6): 476-479.
- Nut** Bedi, S. P. S. and Sawhney, P. C. influence of zinc on growth and digestibility of proximate principles in growing cow calves. *Indian Journal of Animal Sciences*. 49 (1). 1979. 15-21.
- Nut** Bedi, S. P. S. and Sawhney, P. C. 1980. influence of zinc on the metabolism of calcium, phosphorus, zinc, copper and iron in growing cow calves. *Indian Journal of Animal Sciences* 50(1): 25-29.
- Mineral** Bednarek Dariusz, Kondracki Marian(A), and Krasucki Jerzy. 1991. effect of zinc on mineral, haematological and immunological indices in calves. *Polskie Archiwum Weterynaryjne* 31(1-2): 129-140.
- Nut def** Bedwal, R S, Edwards, M S, Katoch, M, Bahuguna, A, and Dewan, R. histological and biochemical changes in testis of zinc deficient balb/c strain of mice. *Indian J. Exp. Biol.* (1994) 32(4): 243-7
- Nut def** Bedwal, R. S., Verma, V., Sinha, A., Dewan, R., and Katoch, M. histological and biochemical changes in the ovary and uterus of zinc deficient sprague dawley rats. *Trace Elem. Electrolytes* (1995) 12(2): 95-108
- Meth** Beecher, D. J. and Wong, A. C. 1994. improved purification and characterization of hemolysin bl, a hemolytic dermonecrotic vascular permeability factor from bacillus cereus [published erratum appears in infect immun 1995 apr;63(4):1615]. *Infection and Immunity* 62(3): 980-6.
- Nut def** Beer, Albert E. requirement of the breeding hen for manganese and zinc. *Feed Forum* (1968) 3(4): 34-7.
- Nut def** Bega, F. and Gjino, P. 1997. zinc and bovine foot diseases. experiences in albania. *Obiettivi e Documenti Veterinari* 18(6): 79-82.
- No COC** Beguin, D. P. and Kincaid, R. L. 1984. 3-hydroxy-3-methyl-glutaryl coenzyme a reductase activity in chicks fed coumestrol, a phytoestrogen. *Poultry Science* 63(4): 686-90.
- Nut** Behling, A. R. and Greger, J. L. 1988. mineral metabolism of aging female rats fed various commercially available calcium supplements or yogurt. *Pharmaceutical Research* 5(8): 501-5.
- Food** Behling, Alison R. and Greger, Janet L. importance of lactose in yogurt for mineral utilization. *J. Agric. Food Chem.* (1990) 38(1): 200-4.
- No COC** Behling, Alison R. and Greger, Janet L. mineral metabolism of aging female rats fed various commercially available calcium supplements or yogurt. *Pharm. Res.* (1988) 5(8): 501-5.
- Nut def** Behne, D., Kyriakopoulos, A., Gessner, H., Vormann, J., and Gunther, T. 1992. sex-related effects of zinc deficiency on the selenium metabolism in rats. *Journal of Trace Elements and Electrolytes in Health and Disease* 6(1)

- Nut def** Behrens, G. 1992. [on the effect of dietary zinc deficiency on the lipid composition of the erythrocyte membrane in rat and swine]. <original> zum einfluss eines alimentaeren zinkmangels auf die lipidzusammensetzung der erythrozytenmembran bei der ratte und beim schwein. 105 P.
- Abstract** Beiraghi, S., Yerkey, M., Rosen, S., Spuller, R., and Beck, M. 1987. effect of zinc and sodium-fluoride in drinking-water on rats. *Journal Of Dental Research* 66: 302.
- Nut def** Belanger, Leonard F. the influence of zinc-deprivation on the mast cell population of the bone marrow and other tissues. *J. Nutr.* (1978) 108(8): 1315-21
- FL** Belem, P. A. D., Viloria, M. I. V., Nunes, V. A., and Pompermeyer, L. G. 1986. lethal trait a 46: a case report. <original> relato de um caso de paraceratose hereditaria dos bezerros. *Arquivo Brasileiro De Medicina Veterinaria e Zootecnia*. V. 38(6) P. 871-879
- CP** Bell, A., Neonsi, L., Abolo, F., Simgba, T., and Menunga. bioavailability to rats of zinc from a cameroonian plantain-based diet influence of zinc and casein supplementation. *SOUTHGATE, D. A. T., I. T. JOHNSON AND G. R. FENWICK (ED.). ROYAL SOCIETY OF CHEMISTRY AND SPECIAL PUBLICATIONS, NO. 72. NUTRIENT AVAILABILITY: CHEMICAL AND BIOLOGICAL ASPECTS; CONFERENCE, NORWICH, ENGLAND, UK, AUGUST 21-24, 1988. XIX+404P. ROYAL SOCIETY OF CHEMISTRY: CAMBRIDGE, ENGLAND, UK. ILLUS. ISBN 0-85186-856-8. 0 (0). 1989. 244-246.*
- No COC** Bell, H. B. and Dimmik R. W. 1975. hazards to predators feeding on prairie voles killed with zinc phosphide. *J.Wildl.Manag.* 39(4): 816-819.
- In Vit** Bell, J. G. and Castillo, R. O. 1989. effect of intraluminal zinc on small intestinal growth and maturation in rats. *Clinical Research* 37: A197.
- Abstract** Bell, J. G. and Castillo, R. O. role of zinc in regulation of small intestinal growth and maturation. *73RD ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, NEW ORLEANS, LOUISIANA, USA, MARCH 19-23, 1989. FASEB (FED AM SOC EXP BIOL) J. 3 (4). 1989. A1079.*
- In Vit** Bell, J. G., Kwong, L. K., and Castillo, R. O. 1988. effect of dietary zinc restriction on small intestinal growth and disaccharidase activity in weanling rats. *Gastroenterology* 94: A31.
- Nut** Bell, J. M., Keith, M. O., and Darroch, C. S. 1988. lysine supplementation of grower and finisher pig diets based on highprotein barley, wheat and soybean meal or canola meal, with observations on thyroid and zinc status. *Canadian Journal of Animal Science* 68(3): 931-940.
- No Oral** Bell, J. U. 1980. induction of hepatic metallothionein in the immature rat following administration of cadmium. *TOXICOLOGY AND APPLIED PHARMACOLOGY* 54(1): 148-155.
- Bio Acc** Bell, J. U., Lopez, J. M., and Bartos, K. D. 1987. the postnatal development of serum zinc, copper and ceruloplasmin in the horse. *Comparative Biochemistry and Physiology, A (Comparative Physiology)* 87(3): 561-564.
- No Oral** Bell, J. U. and Waalkes, M. P. 1982. role of hepatic metallothionein during perinatal development in the rat. *Developments in Toxicology and Environmental Science* 9: 99-111.
- No Oral** Bell J.U., Waalkes M.P., and Thomas J.A. 1982. induction of hepatic metallothionein in the rabbit fetus following maternal cadmium exposure. *TOXICOL. APPL. PHARMACOL* VOL. 62, NO. 2: pp. 211-218.

- Nut def** Bell, Linda Theriault, Branstrator, Margaret, Roux, Charles, and Hurley, Lucille S. chromosomal abnormalities in maternal and fetal tissues of magnesium- or zinc-deficient rats. *Teratology* (1975) 12(3): 221-6.
- Alt** Bell, R. C., Sakanashi, T. M., Keen, C. L., and Finegood, D. T. high fructose intake significantly reduces kidney copper concentrations in diabetic, islet transplanted rats. *Biol. Trace Elem. Res.* (1998) 61(2): 137-149.
- Abstract** Bellows, R. A., Grings, E. E., Staigmiller, R. B., Hould, B. S., Bellows, S. E., and Phelps, D. A. 1995. effects of genotype and zinc supplementation during gestation on dystocia and plasma zinc levels in the dam and calf. *Journal of Animal Science* 73(SUPPL. 1): 322.
- Abstract** Bellows, R. A(A), Grings, E. E(A), Brophy, D. T., Bellows, N. R(A), Bellows, S. E., and Phelps, D. A. 1997. effects of sire, dam, fetal genotype and zinc supplementation on dystocia and zinc concentrations in beef heifers. *Journal of Animal Science* 75(SUPPL. 1): 248.
- Phys** Bellush, L. L. and Reid, S. G. 1994. metabolic and neurochemical profiles in insulin-treated diabetic rats. *American Journal of Physiology* 266(1 Pt 2): R87-94.
- Phys** Ben-Ari, Y. and Cherubini, E. 1991. zinc and gaba in developing brain [letter].
- IMM** Ben-Chetrit, E. 1992. target antigens of the ssa/ro and ssb/la system. *American Journal of Reproductive Immunology* 28(3-4): 256-8.
- No Oral** Bench, G., Corzett, M. H., Martinelli, R., and Balhorn, R. cadmium concentrations in the testes, sperm, and spermatids of mice subjected to long-term cadmium chloride exposure. *Cytometry* (1999) 35(1): 30-36.
- Bio Acc** Bendell-Young, L. I(a) and Bendell, J. F. 1999. grit ingestion as a source of metal exposure in the spruce grouse, *dendragapus canadensis*. *Environmental Pollution*. 106(3): 405-412.
- Gene** Benedetto, M. T., Anzai, Y., and Gordon, J. W. isolation and analysis of the mouse genomic sequence encoding copper zinc superoxide dismutase. *GENE (AMST)*. *GENE (Amsterdam)*. 99 (2). 1991. 191-196.
- FL** Benedito C., J. L., Castillo R., C., Hernandez B., J., Gutierrez P., C., and Garcia P., P. 1997. reproductive period and twin pregnancy modify the serum iron, copper and zinc levels in gallega ewes. *Veterinaria Mexico* 28(1): 35-40.
- FL** Benedito Castellote, Jose Luis, Castillo Rodriguez, Cristina, Hernandez Bermudez, Joaquin, Gutierrez Panizo, Candido, and Garcia Partida, Paulino. 1997. [reproductive period and twin pregnancy modify iron, copper and zinc serum levels in gallega ovine breed]. <original> el periodo reproductivo y la gestacion gemelar modifican las concentraciones sericas de hierro, cobre y cinc en la oveja de raza gallega. *Veterinaria Mexico*. V. 28(1) P. 35-40
- Mix** Bengoumi, M., Essamadi, A. K., Tressol, J. C., Chacornac, J. P., and Faye, B. 1998. comparative effects of selenium supplementation on the plasma selenium concentration and erythrocyte glutathione peroxidase activity in cattle and camels. *Animal Science* 67(3): 461-466.
- Mix** Bengoumi, M., Essamadi, K., Chacornac, J. P., Tressol, J. C., and Faye, B. 1998. comparative relationship between copper-zinc plasma concentrations and superoxide dismutase activity in camels and cows. *Veterinary Research* 29(6): 557-565.
- Plant** BENGTON, C., FOLKESON, L., and GORANSSON, A. growth reduction and branching frequency in *hylocomium splendens* near a foundry emitting copper and zinc. *LINDBERGIA*; 8

(3). 1982 (RECD. 1983). 129-138.

- In Vit** Benhur, E., Rosenthal, I., and Leznoff, C. C. 1988. recovery of chinese-hamster cells following photosensitization by zinc tetrahydroxyphthalocyanine. *Journal Of Photochemistry And Photobiology B-Biology* 2(2): 243-252.
- FL** Benitez G, M. P., Paramo Ramirez, Rosa Maria, and Esquivel Lacroix, Carlos F. 1996. [chemical vasectomy in dogs using a zinc-arginine compound (neutersol)]. <original> vasectomia quimica en perros utilizando un compuesto de zinc-arginina (neutersol). P. 345
- Prim** Benjamin, N., Cleaton-Jones, P., and Leidal, T. I. histometric evaluation of odontoblast responses to nobetec and super syntrex. *ENDOD DENT TRAUMATOL. Endodontics & Dental Traumatology*. 1 (5). 1985 (Recd. 1986). 180-184.
- IMM** Benkova, M., Soltys, J., and Boroskova, Z. 1993. modulation of the blood leucocyte and sheep complement activity by heavy metal immission in experimental fasciolosis. *Helminthologia (Bratislava)* 30(1-2): 29-34.
- Gene** Benn, A., Antoine, M., Beug, H., and Niessing, J. 1991. primary structure and expression of a chicken cdna encoding a protein with zinc-finger motifs. *Gene* 106(2): 207-12.
- Phys** Beno, D. W., Awad, J. A., and Davis, B. H. 1993. gamma-linolenic acid suppression of hepatic ito cell mitogenesis: post-pdgf receptor prostaglandin-independent mechanism. *American Journal of Physiology* 265(5 Pt 1): C1388-95.
- Alt** Bentley, P. J., Chin, B., and Grubb, B. 1984. some observations on the zinc-metabolism of the rabbit lens. *Experimental Eye Research* 38(5): 497-507.
- Nut def** Bentley, P. J. and Grubb, Barbara R. effects of a zinc-deficient diet on tissue zinc concentrations in rabbits. *J. Anim. Sci. (1991)* 69(12): 4876-82
- CP** Bentz, J. S., Thompson, S. A., Heidger, P. M. Jr, Bataineh, Z., and Timms, B. G. effects of prolactin on subcellular zinc localization in the rat prostate gland. *NINETY-NINTH ANNUAL MEETING OF THE AMERICAN ASSOCIATION OF ANATOMISTS, RENO, NEV., USA, APR. 6-10, 1986. ANAT REC.* 214 (3). 1986. 10a.
- No Oral** Benuck, I. and Rowe, F. A. centrally and peripherally induced anosmia influences on maternal behavior in lactating female rats. *PHYSIOL BEHAV. Physiology & Behavior*. 14 (4). 1975 439-448.
- No Oral** Benvenuti, S. and Ioale, P. 1993. olfactory experiments on cory's shearwater (calonectris diomedea): the effect of intranasal zinc sulphate treatment on short-range homing behaviour. *Vol. 60, No. 2, Pp. 207-210 Boll. Zool.*
- No Oral** Benvenuti, S., Ioale, P., Gagliardo, A., and Bonadonna, F. 1992. effects of zinc sulphate-induced anosmia on homing behaviour of pigeons. *Vol. 103A, No. 3, Pp. 519-526 Comp. Biochem. Physiol., A*
- No Oral** Benvenuti, Silvano and Gagliardo, Anna. homing behavior of pigeons subjected to unilateral zinc sulfate treatment of their olfactory mucosa. *J. Exp. Biol. (1996)* 199(11): 2531-2535.
- In Vit** Benzo, C. A. and Haba, G. D. L. development of chick embryo liver during organ culture requirement for zinc insulin. *Journal of Cellular Physiology*. 79 (1). 1972 53-63.
- Org Met** Berchev, K. and Minchev, T. 1967. on histologic changes of polysaccharides, desoxyribonucleic

acid, ribonucleic acid, and some enzymes in the liver of white rats acted on with zinc phosphide. *Nauchni Trudove Na Visshiiia Meditsinski Institut, Sofiia* 46(5): 71-6.

- FL** Berende, P. L. M., Terluin, R. W., and Van Der Wal P. high doses of nitrate in rations for milk fed calves 1. effect on zoo technical characteristics met hemo globin formation and nitrate and nitrite in some organs. *Z TIERPHYSIOL TIERERNAEHR FUTTERMITTELKD. Zeitschrift Fuer Tierphysiologie Tierernaehrung Und Futtermittelkunde.* 42 (6). 1979. 312-321.
- FL** Berende, P. L. M., Terluin, R. W., and Wal, P. van der. 312. high doses of nitrate in rations for milk-fed calves. 1. effect on zoo technical characteristics, methemoglobin formation and nitrate and nitrite in some organs. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde*
- Bact** Berendt, R. F., Long, G. G., Abeles, F. B., Canonico, P. G., Elwell, M. R., and Powanda, M. C. 1977. pathogenesis of respiratory klebsiella pneumoniae infection in rats: bacteriological and histological findings and metabolic alterations. *Infection and Immunity* 15(2): 586-93.
- FL** Berenshtein, F. Ya., Vasilenok, V. V., and Gutkovich, Ya. L. 1974. physiological interrelation of zinc and some biologically active substances. *Tezisy Dokl. - Konf. Beloruss. Biokhim. O-Va. 2nd* : 116-17. Editor(s): Vecher, A. S. Publisher: "Nauka i Tekhnika", Minsk, USSR.
- CP** Berg, D. and Kollmer, W. E. 1987. mobilization of zinc and strontium from bone in zinc deficient rats. *Trace Elem. Anal. Chem. Med. Biol. Proc. Int. Workshop, 4th* : Meeting Date 1986, 265-73. Editor(s): Braetter, Peter; Schramel, Peter. Publisher: de Gruyter, Berlin, Fed. Rep. Ger..
- Abstract** Berg, G. J. and Ollerich, D. A. lamellar structures in purkinje cell dendrites of rat cerebellum. *ANAT REC. Anatomical Record.* 190 (2). 1978 337
- No COC** Berg, J. M. 1985. proposed structure for the zinc-binding domains from transcription factor iiiia and related proteins. *PROC NATL ACAD SCI U S A. Proceedings of the National Academy of Sciences of the United States of America.* 1(99-102)
- Abstract** Berg, L. R. 1968. zinc metabolism of fowl at onset of reproduction. *WASH AGR EXP STA BULL.* 707: 27.
- Unrel** Bergenholtz, G. and Reit, C. 1980. reactions of the dental pulp to microbial provocation of calcium hydroxide treated dentin. *Scandinavian Journal of Dental Research* 88(3): 187-92.
- Gene** Berger, C. N. and Epstein, C. J. genomic imprinting normal complementation of murine chromosome 16. *GENET RES. Genetical Research.* 54 (3). 1989. 227-230.
- Nut** Berger, J. and Schneeman, B. O. 1988. intestinal zinc and carboxypeptidase a and b activity in response to consumption of test meals containing various proteins by rats. *The Journal Of Nutrition.* 118(6): 723-728.
- No COC** Berger, J. and Schneeman, B. O. 1986. stimulation of bile-pancreatic zinc, protein and carboxypeptidase secretion in response to various proteins in the rat. *Journal of Nutrition* 116(2): 265-72.
- Nut** Berger, Jacques and Schneeman, Barbara O. intestinal zinc and carboxypeptidase a and b activity in response to consumption of test meals containing various proteins by rats. *J. Nutr. (1988)* 118(6): 723-8 .
- No Oral** Berger, Jacques and Schneeman, Barbara Olds. stimulation of bile-pancreatic zinc, protein and carboxypeptidase secretion in response to various proteins in the rat. *J. Nutr. (1986)* 116(2):

265-72 .

- Fate** Bergman, B. 1970. the distribution of ^{65}Zn in the endochondral growth sites of the mandibular condyle and the proximal end of the tibia in young rats. an autoradiographic and gamma scintillation study. *Odontologisk Revy* 21(3): 261-74.
- Fate** Bergman, B. the distribution of zinc-65 in the endochondral growth sites of the mandibular condyle and the proximal end of the tibia in young rats an auto radiographic and gamma scintillation study. *Odontologisk Revy*. 21 (3). 1970 261-274.
- Nut def** Bergman, B. 1970. the zinc concentration in hard and soft tissues of the rat. the influence of zinc deficient feeding. *Acta Odontologica Scandinavica* 28(4): 435-40.
- Nut def** Bergman, B., Friberg, U., Lohmander, S., and Oberg, T. 1972. the importance of zinc to cell proliferation in endochondral growth sites in the white rat. *Scandinavian Journal of Dental Research* 80(6): 486-92.
- Nut def** Bergman, B., Friberg, U., Lohmander, S., and Oberg, T. 1970. morphologic and autoradiographic observations on the effect of zinc deficiency on endochondral growth sites in the white rat. *Odontologisk Revy* 21(4): 379-99.
- Bio Acc** Bergman, B., Sjostrom, R., and Wing, K. R. 1974. the variation with age of tissue zinc concentrations in albino rats determined by atomic absorption spectrophotometry. *Acta Physiologica Scandinavica* 92(4): 440-450.
- Nut def** Bergman, B. and Wing, K. R. 1974. the turnover of ^{65}Zn in rats fed a zinc-deficient diet. *Acta Physiologica Scandinavica* 92(4): 451-64.
- Nut def** Bergman, B and Wing, K R. the turnover of ^{65}Zn [zinc isotopes] in rats fed a zinc-deficient diet. *Acta Physiol Scand* Dec 1974 92 (4): 451-464. Ref.
- Nut def** Bergman, B. and Wing, K. R. 1974. turnover of Zn-^{65} in rats fed a zinc-deficient diet. *Acta Physiologica Scandinavica* 92(4): 451-464.
- Chem Meth** Bergman, Bo. 1970. concentration of zinc in some hard and soft tissues of rat determined by neutron activation analysis. *Acta Radiol. Ther., Phys., Biol.* 9(5): 420-32 .
- Nut def** Bergman, Bo. zinc concentration in hard and soft tissues of the rat . the influence of zinc-deficient feeding. *Acta Odontol. Scand. (1970)* 28(4): 425-40.
- Nut def** Bergman, Bo, Friberg, Ulf, Lohmander, Stefan, and Oberg, Torsten. importance of zinc to cell proliferation in endochondral growth sites in the white rat. *Scand. J. Dent. Res. (1972)* 80(6): 486-92.
- Nut def** Bergman, Bo, Friberg, Ulf, Lohmander, Stefan, and Oberg, Torsten. morphologic and autoradiographic observations on the effect of zinc deficiency on endochondral growth sites in the white rat. *Odontol. Revy (1970)* 21(4): 379-99.
- Bio Acc** Bergman, Bo, Sjostrom, Rolf, and Wing, Kenneth R. variation with age of tissue zinc concentrations in albino rats determined by atomic absorption spectrophotometry. *Acta Physiol. Scand. (1974)* 92(4): 440-50
- Nut def** Bergman, Bo and Wing, Kenneth R. turnover of zinc-65 in rats fed a zinc-deficient diet. *Acta Physiol. Scand. (1974)* 92(4): 451-64

- Effl** Bergmann, B. A., Rubin, A. R., and Campbell, C. R. 1997. potential of paulownia elongata trees for swine waste utilization. *Transactions of the ASAE* 40(6): 1733-1738.
- FL** Bergner, Hans and Pueschner, Arno. use of polyphosphates in animal nutrition. 8. influence of different polyphosphates and metaphosphates upon zinc metabolism in rats. *Arch. Tierernaehr.* (1970) 20(4): 375-85
- Unrel** Beriajaya, Estuningsih, S. E., Darmono, Knox, M. R., Stoltz, D. R., and Wilson, A. J. 1995. the use of wormolas in controlling gastrointestinal nematode infections in sheep under traditional grazing management in indonesia. *Jurnal Ilmu Ternak Dan Veteriner* 1(1): 49-55.
- Abstract** Berman, W. F., Keathley, P., Chan, W., and Kalan, J. 1982. zinc uptake by rat intestine - kinetic and developmental analysis. *Journal Of The American College Of Nutrition* 1: 114.
- Org Met** Bernabeu, Ramon, Princ, Fernando, Levi, De Stein Miguelina, Fin, Cyntia, Juknat, Adela Ana, Izquierdo, Alcira Vv Batilean, and Medina, Jorge H A. 1995. evidence for the involvement of hippocampal co production in the acquisition and consolidation of inhibitory avoidance learning. *Neuroreport* 6(3): 516-518.
- Alt** Bernard, J. K., Amos, H. E., and Evans, J. J. 1989. influence of zinc sulfate and protein solubility on protein and aminoacid metabolism in steers. *Nutrition Reports International* 40(6): 1117-1126.
- CP** Bernard Ora and Ganiatsas Soula. 1993. kiz-1, a very unusual protein with kinase and zinc finger domains. *Journal of Cellular Biochemistry Supplement* 0(17 PART A): 250.
- CP** Berrie, R. A., Hallford, D. M., Galyean, M. L., Birch, M. W., Christensen, B. L., Schneider, F. A., and Ortiz, A. 1994. growth and carcass characteristics of lambs fed supplemental zincsulfate or zinc methionine. <document title>proceedings western section, american society of animal science, june 22-24, 1994, las cruces, new mexico. volume 45. 137-139.
- Nut** Berry, B. W., Leddy, K. F., and Bodwell, C. E. 1985. sensory characteristics, shear values and cooking properties of ground-beef patties extended with iron-fortified and zinc-fortified soy isolate, concentrate or flour. *Journal Of Food Science* 50(6): 1556-1559.
- CP** Berry, W. D. and Brake, J. effect of 3 induced molting regimes on uterine dry matter and lipid in single comb white leghorn hens. *5TH ANNUAL MEETING OF THE SOUTHERN POULTRY SCIENCE SOCIETY, ATLANTA, GA., USA, JAN. 17-18, 1984. POULT SCI.* 63 (Suppl. 1). 1984. 4.
- No Dose** Berry, W. D. and Brake, J. 1987. postmolt performance of laying hens molted by high dietary zinc, low dietary sodium, and fasting: egg production and eggshell quality. *Poult. Sci.* 66(2): 218-26 .
- CP** Berry, W. D., Gildersleeve, R. P., and Brake, J. hens induced to molt by fasting or high dietary zinc exhibit hematological and splenic changes. *73RD ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC. POULT SCI.* 63 (Suppl. 1). 1984. 64.
- FL** Berta, F., Cava, P. L., and Ladetto, G. 1983. the use of zinc bacitracin as a growth promoter in the diets of growing rabbits. *Annali Della Facolta Di Medicina Veterinaria Di Torino* 29: 80-89.
- No Tox** Berthelot, A., Luthringer, C., and Exinger, A. trace elements during the development of hypertension in the spontaneously hypertensive rat. *Clin. Sci.* (1987) 72(4): 515-18 .

- FL** Bertino, R., Oatti, F., Caruso, G., Rampello, L., Speciale, C., Raffaele, R., Giammona, G., and Marano, P. effects of zinc sulfate on limbic motor epilepsy induced by kainic acid. *Boll. - Soc. Ital. Biol. Sper.* (1984) 60(9): 1721-5
- FL** Bertol, T. M. and Brito, B. G. de. 1998. effect of high levels of supplemental zinc on piglets performance and mortality. <original> efeito de altos niveis de zinco suplementar no desempenho e na mortalidade de leitões. *Pesquisa Agropecuaria Brasileira*. V. 33(9) P. 1493-1501
- FL** Bertol, T. M. and Brito, B. G. de. 1995. effect of zinc oxide and copper sulphate with or without feedrestriction on weaning and diarrhoea incidence in piglets. *Revista Da Sociedade Brasileira De Zootecnia* 24(2): 278-288.
- Bio Acc** Bertoni, G., Cappa, V., and Galimberti, A. 1977. analytical characteristics of hybrid maize harvested at various stages of maturity. *Revista Di Zootecnia e Veterinaria* (4): 346-356.
- Nut** Bertoni, G. and Cappelli, F. P. 1994. effect of nutrition on metabolic and productive status of buffaloes. *Informatore Agrario* 50(18): 29-33.
- CP** Bertrand, J. E., Lutrick, M. C., Edds, G. T., and West, R. L. 1981. animal performance, carcass quality, and tissue residues with beefsteers fed forage sorghum silages grown on soil treated with liquiddigested sludge. *Soil and Crop Science Society of Florida Proceedings* 40: 111-114.
- FL** Bertuzzi, S., Manfreda, G., and Franchini, A. Bologna Univ. Italy Istituto di Zootecnica. 1998. influence of dietary inorganic zinc and vitamin e on broiler immune response. <original> influenza di zinco inorganico e vitamina e dietetici sulla risposta immunitaria del pollo da carne. *Selezione Veterinaria*. (No.8-9) P. 627-636
- FL** Berzin, N., Markov, Yu. G., and Val'dman, A. R. absorption and localization of zinc in the ileum of chicks according to their supply with vitamin a. *Byull. Eksp. Biol. Med.* (1989) 108(7): 37-40.
- FL** Berzin', N. I. 1984. the action of vitamin a on protein binding of zinc in the mucousmembrane of the jejunum in chickens. <Document Title>Transportnye i Obmennye Protsessy v Kishechnikezhivotnykh. 57-66.
- Nut def** Berzin', N. I. 1988. interrelation between vitamin a and zinc in animals. *Vestnik Sel'Skokhozyaistvennoi Nauki* (1): 106-111 .
- No Oral** Berzin', N. I., Andrushaite, R. E., and Galvanovskii, Yu. Ya. 1986. rapid stimulatory action of 1 alpha -hydroxycholecalciferol on permeability of the small intestinal epithelia of chickens for minerals. 22-23.
- FL** Berzin', N. I. and Bauman, V. K. 1982. zinc-binding capacity of mucous membrane of small intestine of chickens and its dependence on vitamin a availability. <Document Title>Biokhimiya Vsasyvaniya Pitatel'Nyk Veshchestv Uzhivotnykh. 68-76.
- FL** Berzin', N. I. and Smirnova, G. Yu. 1985. [the effect of zn level in the diet on the amount of zn-fixing proteins and zn absorbtion in the intestine of chicks]. <original> vliyanie urovnya tsinka v ratsione na sodержanie tsinksvyazyvayushchikh belkov i vsasyvanie tsinka v kishhechnike tsyplyat. [food programme: biochemistry of agricultural animals]. <original> biokhimiya sel'skokhozyajstvennykh zhivotnykh i prodovol'stvennaya programma. P. 29-30
- FL** Berzina, N. effect of zinc on the development of vitamin a deficiency and vitamin a metabolism in chicks. *Usvoenie Pishch. Veshchestv v Organizme Zhivotnykh.* (1977) 43-8 From: Ref. Zh. Biol. Khim. 1977, Abstr. No. 23Ch2.

- Drug** Berzina, N. and Bauman, V. vitamin a-dependent zinc-binding protein and intestinal absorption of zinc in chicks. *Br. J. Nutr.* (1987) 57(2): 255-68.
- FL** Berzins, N. effect of vitamin a on the binding of zinc to proteins of the ileal mucosa of chicks. *Transp. i Obmen. Protsessy v Kishhechnike Zhivotnykh* Riga : Riga (1984) 57-66 From: Ref. Zh., Zhivotnovod. Vet. 1985, Abstr. No. 558286.
- FL** Berzins, N., Bauman, V., and Valdman, A. vitamin a-dependent zinc-binding protein in intestinal epithelium of chicks. *Dokl. Akad. Nauk SSSR* (1983) 268(1): 239-42 [Biochem.]
- Nut def** Beshgetoor, D. and Lonnerdal, B. 1997. effect of marginal maternal zinc deficiency in rats on mammary gland zinc metabolism. *The Journal Of Nutritional Biochemistry.* 8(10): 573-578.
- Nut def** Beshgetoor Donna and Lonnerdal Bo. 1994. effects of marginal maternal zinc deficiency on mammary zinc metabolism. *FASEB Journal* 8(4-5): A695.
- BioX** Besler, H. T. and Grimble, R. F. 1995. comparison of the modulatory influence of maize and olive oils and butter on metabolic responses to endotoxin in rats. *Clin. Sci.* 88(1): 59-66 .
- Phys** Besnard Nathalie, Pisselet Claudine, Monniaux Danielle, and Monget Philippe= (A). 1997. proteolytic activity degrading insulin-like growth factor-binding protein-2, -3, -4, and -5 in healthy growing and atretic follicles in the pig ovary. *Biology of Reproduction* 56(4): 1050-1058.
- FL** Besschetnov, I. I. content and distribution of zinc in the yolk sac, liver, and blood of chick embryos during their development. *S-Kh. Biol.* (1974) 9(6): 900-5.
- Bio Acc** Besschetnov, I. I. and Chorayan, O. G. dynamics of informational characteristics of the chemical content of developing chicken embryo organs. *Arkh. Anat. Gistol. Embriol.* (1981): 81(11), 89-92 .
- FL** Bessei, W. 1994. effect of zinc bacitracin on the performance and egg quality of layinghens given different levels and sources of protein. *Archiv Fur Geflugelkunde* 58(5): 219-223.
- FL** Bessei, W. the inauguration of a laying pause by sodium-deficient and zinc-rich rations. *Kraftfutter* (1979) 62(3): 157-62 .
- FL** Bessei, W. and Lantzsch, H. J. 1980. induction of pauses in laying with diets rich in zinc. *Archiv Fur Geflugelkunde* 44(3): 133-140.
- FL** Bessei, W. and Lantzsch, H. J. studies to induce laying pauses by zinc rich diets. *Arch. Gefluegelkd.* (1980) 44(3): 133-40.
- FL** Bessei, W., Trziszka, T., Kutritz, B., and Clostermann, G. 1993. changes in egg quality and lysozyme activity in response to storage time and feeding of growth promoters. *Archiv Fur Geflugelkunde* 57(4): 166-170.
- FL** essionov, A. I., Polozova, I. A., Roslyakova, V. A., and Anvarova, G. G. 1988. enrichment of boar rations with iodine, cobalt and zinc. <document title>tez. dokl. nauch.-prakt. konf. prof.-prep. sostava.posvyashch. 70-letnemu yubileyu perm. instituta. 73-74.
- OAC** Bestak, R., Barnetson, R. S., Nearn, M. R., and Halliday, G. M. 1995. sunscreen protection of contact hypersensitivity responses from chronic solar-simulated ultraviolet irradiation correlates with the absorption spectrum of the sunscreen. *Journal of Investigative Dermatology* 105(3): 345-51.

- FL** Bestetti, G. and Soffiatti, M. G. 1975. experimental goitre in fowls, following prolonged treatment with zineb. pathological findings. *Annali Della Facolta Di Medicina Veterinaria Di Torino* 22: 216-232.
- HHE** Beswick, P. H., Brannen, P. C., and Hurles, S. S. 1986. the effects of smoking and zinc on the oxidative reactions of human-neutrophils. *Journal Of Clinical & Laboratory Immunology* 21(2): 71-75.
- Nut def** Bettger, W. J. the effect of dietary zinc deficiency on erythrocyte-free and membrane-bound amino acids in the rat. *Nutr. Res. (N. Y.)* (1989) 9(8): 911-19
- In Vit** Bettger, W. J., Fish, T. J., and O'Dell, B. L. effects of copper and zinc status of rats on erythrocyte stability and superoxide dismutase activity. *Proc. Soc. Exp. Biol. Med.* (1978) 158(2): 279-82 .
- Nut def** Bettger, W. J. and Mccorquodale, M. 1993. effect of dietary zinc deficiency on the oligomeric form, membrane skeleton attachment and heteroanion exchange rate of anion exchange protein 1 (ae1) in the rat erythrocyte. *FASEB Journal* 7(3-4): A736 .
- Nut def** Bettger, W. J. and Odell, B. L. 1983. effect of dietary-protein on plasma zinc concentrations in rats fed zinc-deficient diets. *Federation Proceedings* 42: 820.
- Nut def** Bettger, W. J., Reeves, P. G., Moscatelli, E. A., Savage, J. E., and O'dell, B. L. interaction of zinc and poly unsaturated fatty-acids in the chick. *Journal of Nutrition.* 110 (1). 1980. 50-58.
- Nut def** Bettger, W. J. and Taylor, C. G. 1986. effects of copper and zinc status of rats on the concentration of copper and zinc in the erythrocyte membrane. *Nutrition Research* 6(4): 451-457.
- Nut def** Bettger, W. J., Wong, L. H., and Paterson, P. G. effect of environmental temperature on food intake and deficiency signs in rats fed zinc-deficient diets. *Nutrition and Behavior.* 3 (3). 1986. 241-249.
- Nut def** Bettger, William J. effect of dietary protein or amino acids on the rapid change in plasma zinc concentration in rats fed zinc deficient diets. *Nutr. Res. (N. Y.)* (1985) 5(10): 1153-9.
- Nut def** Bettger, William J. and Bray, Tammy M. effect of dietary zinc or copper deficiency on catalase, glutathione peroxidase and superoxide dismutase activities in rat heart. *Nutr. Res. (N. Y.)* (1989) 9(3): 319-26
- Nut def** Bettger, William J., Reeves, Philip G., Moscatelli, Ezio A., Reynolds, Genevieve, and O'Dell, Boyd L. interaction of zinc and essential fatty acids in the rat. *J. Nutr.* (1979) 109(3): 480-8
- Nut def** Bettger, William J., Reeves, Philip G., Moscatelli, Ezio A., Savage, James E., and O'Dell, Boyd L. interaction of zinc and polyunsaturated fatty acids in the chick. *J. Nutr.* (1980) 110(1): 50-8
- CP** Bettger, William J., Reeves, Philip G., Savage, James E., and O'Dell, Boyd L. interaction of zinc and vitamin e in the chick. *Proc. Soc. Exp. Biol. Med.* (1980) 163(3): 432-6
- Nut def** Bettger, William J., Savage, James E. , and O'Dell, Boyd L. effects of dietary copper and zinc on erythrocyte superoxide dismutase activity in the chick. *Nutr. Rep. Int.* (1979) 19(6): 893-900 .
- Acu** Bettger, William J., Savage, James E., and O'Dell, Boyd L. 1981. extracellular zinc concentration and water metabolism in chicks. *J. Nutr.* (1981) 111(6): 1013-19 .

- Nut def** Bettger, William J. and Taylor, Carla G. effects of copper and zinc status of rats on the concentration of copper and zinc in the erythrocyte membrane. *Nutr. Res. (N. Y.)* (1986) 6(4): 451-7 .
- Unrel** Betz, H., Kuhse, J., Schmieden, V., Laube, B., Kirsch, J., and Harvey, R. J. 1999. structure and functions of inhibitory and excitatory glycine receptors. *Annals of the New York Academy of Sciences* 868: 667-76.
- No COC** Betz, J. 1993. detoxification of ochratoxin a: effects of dietary alkali sources calcium hydroxide and monomethylamine on blood and urine variables and residues in pigs. 248 pp.
- No COC** Betz, W. J., Caldwell, J. H., and Ribchester, R. R. 1980. sprouting of active nerve terminals in partially inactive muscles of the rat. *Journal of Physiology* 303: 281-97.
- CP** Beutler, K. T., Pankewycz, O., and Brautigan, D. L. 1997. uptake of organic and inorganic zinc compounds. *Poultry Science* 76(SUPPL. 1): 61.
- Surv** Beyer, W. N., Day, D., Morton, A., and Pachepsky, Y. 1998. relation of lead exposure to sediment ingestion in mute swans on the chesapeake bay, usa. *Environmental Toxicology and Chemistry*. 17(11): 2298-2301.
- No Dose** Beyer, W. N., Pattee, O. H., Sileo, L., Hoffman, D. J., and Mulhern, B. M. 1985. metal contamination in wildlife living near 2 zinc smelters. *ENVIRON POLLUT SER A ECOL BIOL*. 38(1): p63-86.
- FL** Beynen, A. C. high zinc intake reduces biliary copper excretion in rats. *J. Anim. Physiol. Anim. Nutr.* (1994) 72(4/5): 169-75.
- Phys** Bezakova Gabriela and Bloch Robert J(A). 1998. the zinc finger domain of the 43-kda receptor-associated protein, rapsyn: role in acetylcholine receptor cluster. *Molecular and Cellular Neuroscience* 11(5-6): 274-288.
- Mix** Bezlepkin, Vladimir G., Sirota, Nikolai P., and Gaziev, Azhub I. the prolongation of survival in mice by dietary antioxidants depends on their age by the start of feeding this diet. *Mech. Ageing Dev.* (1996) 92(2,3): 227-234.
- No Dose** Bezuidenhout, A. J., Burger, W. P., Reyers, F., and Soley, J. T. 1994. serum- and bone-mineral status of ostriches with tibiotarsal rotation. *Onderstepoort Journal of Veterinary Research* 61(3): 203-206.
- Org Met** Bhardwaj, D. and Khan, J. A. responses of roof rat, rattus rattus l., to non-oily and oily foods after poisoning in oily foods. *Proc. Indian Acad. Sci. B* 88(2): 125-129 1979 (12 References)
- FL** BHARDWAJ, D., SIDDIQUI, J. A., and KHAN, J. A. mitigating poison and bait shyness developed by wild rats rattus-rattus 2. use of boiled foods and oily cereal mixtures. *Z ANGEW ZOOL; 71* (3). 1984 (RECD. 1985). 339-346.
- Org Met** Bhat, S. K. and Mathew, D. N. comparative toxicity of 2 acute rodenticides to the western ghats squirrel funambulus-tristriatus. *INT PEST CONTROL. International Pest Control*. 23 (5). 1981. 132.
- Org Met** Bhatnagar, R. K., Palta, R. K., Bhandari, J. K., and Saxena, P. N. 1991. responses in nisokia indica (sic) gray to zinc phosphide baits. *Journal of Entomological Research* 15(2): 149-150.
- No COC** Bhatnagar, R. K. Palta R. K. Bhandari J. K. and Saxena P. N. 1991. responses in nesokia indica

gray to zinc phosphide baits. *J.Entomol.Res.* 15(2): 149-150.

- Nut** Bhattacharya, M., Dey, S. C., Mukit, A., and Sapkota, D. 1993. effect of feed additives on the microelements of poultry liver. *Indian Journal of Poultry Science* 28(2): 141-143.
- Mineral** Bhattacharyya, B. N., Talukdar, S. C., Baruah, R. N., Baruah, K. K. Sr., Baruah, K. K. Jr., and Baruah, A. 1995. studies on circulatory levels of trace minerals at different reproductive status in goat. *Indian Journal of Animal Reproduction* 16(2): 96-98.
- Bact** Bhattacharjee, J. W. 1986. effect of cadmium and zinc on microbial adhesion, growth, and metal uptake. *Bulletin Of Environmental Contamination And Toxicology* 36(3): 396-400.
- Bio Acc** Bhatti Mohammad S. 1995. protein, energy and mineral analyses of pigeon's milk. *Poultry Science* 74(SUPPL. 1): 33.
- No Oral** Bhere, S. K., Deshmukh, B. T., Nagvekar, A. S., and Talvelkar, B. A. 1997. effect of bovine somatotropin on production parameters in cows. *Indian Journal of Animal Sciences* 67(10): 897-901.
- FL** BiaLecka, M. 1997. [the effect of bioflavonoids and lecithin on the course of experimental atherosclerosis in rabbits]. <original> wpływ bioflawonoidow i lecytyny na przebieg mia.ang.zd.ang.zycy doswiadczalnej u krolikow. *Annales Academiae Medicae Stetinensis* 43: 41-56.
- Drug** Bialecka, Monika. effect of bioflavonoids and lecithin on the course of experimental atherosclerosis in rabbits. *Rocz. Pomor. Akad. Med. Szczecinie* (1997) : 43, 41-56.
- Unrel** Bianchi, N. O. 1991. sex determination in mammals. how many genes are involved? *Biology of Reproduction* 44(3): 393-7.
- HHE** Bicknell, J. M. and Wiggins, R. V. 1988. taste disorder from zinc-deficiency after tonsillectomy. *Western Journal Of Medicine* 149(4): 457-460.
- CP** Bigalke, R. C., Van Hensbergen H J, <Book> Spitz F, Janeau, G., Gonzalez, G., and Aulagnier S: Eds. 1992. observations on a reproductively isolated population of blesbok (*damaliscus dorcas phillipsi*) in a mineral deficient environment. <book> ongules/ungulates 91. 497-503.
- FL** Bigler, B. 1978. experimental and clinical study of endodontal treatment of the teethdogs. *Zentralblatt Fur Veterinarmedizin* 25A(10): 794-813.
- Nut def** Bills, N. D., Koury, M. J., Clifford, A. J., and Dessypris, E. N. ineffective hematopoiesis in folate-deficient mice. *Blood* (1992) 79(9): 2273-80
- Nut** Bindra, G. S., Gibson, R. S., and Thompson, L. U. 1986. [phytate][calcium] [zinc] ratios in asian immigrant lacto-ovo vegetarian diets and their relationship to zinc nutriture. *Nutrition Research* 6(5): 475-483.
- No Oral** Bing, O., Grundemar, L., Ny, L., Moller, C., and Heilig, M. 1995. modulation of carbon monoxide production and enhanced spatial learning by tin protoporphyrin. *Neuroreport* 6(10): 1369-72.
- Abstract** Bingle, C. D., Srai, S. K. S., and Epstein, O. developmental changes in hepatic copper binding proteins in the guinea-pig. 22ND MEETING OF THE EUROPEAN ASSOCIATION FOR THE STUDY OF THE LIVER, TORINO, ITALY, SEPTEMBER 3-5, 1987. *J HEPATOL (AMST)*. 5 (Suppl. 1). 1987. S95.

- Ecol** Bingman, V. P. and Benvenuti, S. 1996. olfaction and the homing ability of pigeons in the southeastern united states. *Vol. 276, No. 3, Pp. 186-192 J. Exp. Zool.*
- Ecol** Bingman, V. P(A), Alyan, S., and Benvenuti, S. 1998. the importance of atmospheric odours for the homing performance of pigeons in the sonoran desert of the southwestern united states. *Journal of Experimental Biology* 201(5): 755-760.
- FL** Binnerts, W. T. 1981. <translated> zinc deficiency during pregnancy leads to skeletal malformation of unborn rats. zinkgebrek gedurende de dracht leidt tot misvormingen van het skelet bij ongeboren ratten. *Voeding.* 41 (8): 302-303.
- Not Avail** Binnerts, W. T., <Editors> D. Giesecke, G. Dirksen, and M. Stangassinger. 1981. intensification and trace element intake of dairy cows. 263-266.
- FL** Biolatti, B., Bollo, E., Appino, S., and Donn, A. 1994. pathology due to anabolic agents in veal heifers. *Medicina Veterinaria* 11(4): 241-246, 248.
- FL** Bires, J., Bajova, V., Vrzgula, L. Vysoka Skola Veterinarska Kosice CSFR, Strojny, L., Kovarova, E., Levkutova, M., Surmikova, J., Arendarcik, T., and Benuska, N. M. 1991. humoral immunity response to parenteral zinc preparation zindep inj. a.u. v. (biotika) in pregnant cows. <original> vplyv pripravku zindep inj. a. u. v. (biotika) na vybrane ukazovatele humoralnej imunity u gravidnych dojníc. *Biopharm.* V. 1(3) P. 103-109
- FL** Bires, J., Bartko, P., Jencik, F., Weisssova, T., Jesenska, M., and Biresova, M. 1995. possibilities of elimination of magnesite light ash impacts in beefbulls. *Veterinarni Medicina* 40(2): 35-44.
- FL** Bires, J., Juhasova, Z. Ustav Experimentalnej Veterinarnej Mediciny Kosice CSFR, Vrzgula, L., Bartko, P., and Hegedoes, I. 1991. the possibilities to influence piglet production by intramuscular administration of zinc to sows during gestation. <original> moznosti ovplyvnenia produkcie prasiat injekcnou aplikaciou zinku prasniciam pocas gravidity. *Zivocisna Vyroba - UVTIZ.* V. 36(1) P. 37-45
- FL** Bires, J. Ustav Experimentalnej Veterinarnej Mediciny Kosice CSFR, Vrzgula, L., and Hojerova, A. 1990. changes in the phagocytic activity of blood leukocytes, concentrations of plasma ig and albumin in sheep fed pollutant substrate. <original> zmeny fagocytarnej aktivity krvnych leukocytov, hladiny plazmovych ig a albuminu oviec po skrmovani emisneho substratu. *Zivocisna Vyroba - UVTIZ.* V. 35(9) P. 763-771
- FL** Bires, J. Ustav Experimentalnej Veterinarnej Mediciny Kosice Czechoslovakia, Vrzgula, L., Kolodziesky, L., Zarik, V., and Benuska, N. 1990. [skin parakeratosis in calves after administration of zinc]. <original> ovplyvnenie parakeratoznych zmien na kozi teliat po injekcnej aplikaci zinkoveho pripravku. *Veterinarstvi.* V. 40(3) P. 109-110
- FL** Bires, J. Vysoka Skola Veterinarska Kosice CSFR, Harvan, M., Hudak, P., Mucha, L., and Juhasova, Z. 1991. the effect of zindep inj. preparation on zincaemia, t-lymphocytes and beta-lysine in pregnant dairy cows. <original> vplyv pripravku zindep inj. na zinkemiu, t-lymfocyty a beta-lyzin u gravidnych dojníc. *Veterinarni Medicina - UVTIZ.* V. 36(11) P. 541-648
- No Oral** BIRGE, W. J. and JUST, J. J. sensitivity of vertebrate embryos to heavy metals as a criterion of water quality. *NTIS PB REPORT (PB-226 850):20 PP,1973*
- Herp** Birge, W. J. and Just, J. J. 1975. *Sensitivity of Vertebrate Embryos to Heavy Metals As a Criterion of Water Quality. Phase II. Bioassay Procedures Using Developmental Stages As Test Organisms.* <NOTE> Research Rept. RR-84; W75-06352; OWRT-B-039-KY(1)

- FL** Birke, H., Kolb, E., Salomon, F. V., Buechner, A., Nestler, K., Siebert, P., and Vallentin, G. Helsinki Univ. Finland Faculty of Veterinary Medicine. 1996. biochemical analysis of pig fetuses. 2. the tissue content of total p, iron, copper and zinc. <original> untersuchungen an schweinefeten. 2. mitteilung: der gehalt an gesamt-p, an fe, an cu und an zn in den gewebe. *Tieraerztliche Umschau*. V. 51(9) P. 582-591
- HHE** Birkenmeier, G. and Kunath, M. 1996. ligand interaction of human alpha 2-macroglobulin-alpha 2-macroglobulin receptor studied by partitioning in aqueous two-phase systems. *Journal of Chromatography* 680(1-2): 97-103.
- No Oral** Birkhahn, R. H., Askari, A., and Thomford, N. R. 1986. total parenteral feeding of rats with an acetoacetate monoglyceride and glucose mixture. *Journal of Nutrition* 116(5): 851-64.
- Nut** Bis-Wencel Hanna. 1995. the effect of extramineral feeding of goats on the level of mineral elements in the blood serum. *Medycyna Weterynaryjna* 51(2): 81-83.
- Nut def** Bises, G., Mengheri, E., and Gaetani, S. t-lymphocyte subsets in zinc deficient and in protein malnourished rats. *Nutr. Rep. Int.* (1987) 36(6): 1371-8.
- Phys** Bishayee, S. and Bachhawat, B. K. 1972. subcellular distribution, age dependent variation and species differences of brain pyridoxal phosphate phosphatase. *Neurobiology* 2(1): 12-20.
- Mix** Bishop, Christine A., Boermans, Herman J. , Ng, Peggy, Campbell, G. Douglas, and Struger, John. health of tree swallows (tachycineta bicolor) nesting in pesticide-sprayed apple orchards in ontario, canada. i. immunological parameters. *J. Toxicol. Environ. Health* Part A (1998): 55(8), 531-559.
- Surv** Bishop, Christine A., Van Der Kraak, Glen J., Ng, Peggy, Smits, Judit E. G., and Hontela, Alice. health of tree swallows (tachycineta bicolor) nesting in pesticide-sprayed apple orchards in ontario, canada. ii. sex and thyroid hormone concentrations and testes development. *J. Toxicol. Environ. Health* Part A (1998): 55(8), 561-581.
- No Org** Bishop Philip Keith(A), Lerner David Nicholas, Jakobsen Rasmus, Gosk Edmund, Burston Mark William, and Chen Tong. 1993. investigation of a solvent polluted industrial site on a deep sandstone-mudstone sequence in the uk: part 2. contaminant sources, distributions, transport and retardation. *Journal of Hydrology (Amsterdam)* 149(1-4): 231-256.
- Anat** Bisic, Dijana, Simin, Marija, Verbanac, Donatella, and Milin, Cedomila. dynamics of liver tissue zinc and copper during compensatory liver growth in mice. *Acta Pharm. (Zagreb)* (1999) 49(2): 99-105.
- FL** Bityutskij, V. S. and Gerasimenko, V. G. 1993. [structural and functional state of organs, systems and organism resistance of chicken broilers when adding zinc and zeolite into diets]. <original> strukturno-funktsional'noe sostoyanie organov,sistem i rezistentnost' organizma tsyplyat-brojlerov pri dobavke v ratsion tsinka i tseolita. [functional morphology, embryo and newborn animal diseases]. <original> funktsional'naya morfologiya, bolezni plodov i novorozhdennykh zhivotnykh. P. 15-18
- BioX** BJARNASON, J. B. and FOX, J. W. hemorrhagic metalloproteinases from snake venoms. *PHARMACOLOGY & THERAPEUTICS*; 62 (3). 1994. 325-372.
- Alt** Bjoerklund, Haakan, Lind, Birger, Piscator, Magnus, Hoffer, Barry, and Olson, Lars. 1981. lead, zinc, and copper levels in intraocular brain tissue grafts, brain, and blood of lead-exposed rats. *Toxicol. Appl. Pharmacol.* 60(3): 424-30 .

- CP** Bjorklund, H., Palmer, M., Olson, L., Seiger, A., and Hoffer, B. 1983. cerebellar purkinje neuron hypoexcitability induced by chronic perinatal lead exposure. *Federation Proceedings* 42(15): 3207-12.
- Nut def** Bk, J., Simonsen, P. E., Friis, H., and Christensen, N. Oe. zinc deficiency and host response to helminth infection: echinostoma caproni infections in cba mice. *J. Helminthol.* (1996) 70(1): 7-12.
- HHE** Black, M. R., Medeiros, D. M., Brunett, E., and Welke, R. 1988. zinc supplements and serum-lipids in young-adult white males. *American Journal Of Clinical Nutrition* 47(6): 970-975.
- Unrel** Blackman, C. F., Benane, S. G., House, D. E., and Elliott, D. J. 1990. importance of alignment between local dc magnetic field and an oscillating magnetic field in responses of brain tissue in vitro and in vivo. *Bioelectromagnetics* 11(2): 159-67.
- No COC** Blackshear, P. J. and Alberti, K. G. M. M. 1975. sequential amino acid measurements during experimental diabeticketoacidosis. *American Journal of Physiology* 228(1): 205-211.
- Rev** Blain, J. and Blain, J. J. 1983. hereditary parakeratosis in cattle of the friesland type. observations in france. *Bulletin Mensuel De La Societe Veterinaire Pratique De France* 67(2): 103...110.
- HHE** Blakeborough, P., Salter, D. N., and Gurr, M. I. 1983. zinc-binding in cows and human milks - possible implications for infant nutrition. *Journal Of The Science Of Food And Agriculture* 34: 274-275.
- HHE** Blakeborough, P., Salter, D. N., and Gurr, M. I. 1983. zinc-binding in cows milk and human-milk. *Biochemical Journal* 209(2): 505-512.
- No Oral** Blakley, B. R. 1988. influence of copper and zinc on urethan-induced adenoma development in mice. *Drug-Nutrient Interactions* 5(4): 395-401.
- Carcin** Blakley, Barry R. influence of copper and zinc on urethane-induced adenoma development in mice. *Drug-Nutr. Interact.* (1988) 5(4): 395-401 .
- Diss** Blalock, T. L. 1986. studies on the role of iron in the reversal of zinc, cadmium, vanadium, nickel and cobalt toxicities in broiler pullets. *Diss. Abstr. Int. B* 1986, 47(2), 577-8.: 188 pp.
- Abstract** Blalock, T. L., Dunn, M. A., and Cousins, R. J. sensitivity of native metallothionein promoters to dietary copper and zinc. *71ST ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, WASHINGTON, D.C., USA, MARCH 29-APRIL 2, 1987. FED PROC.* 46 (3). 1987. 884.
- Mix** Blalock, T. Lynn, Dunn, Michael A., and Cousins, Robert J. metallothionein gene expression in rats : tissue-specific regulation by dietary copper and zinc. *J. Nutr.* (1988) 118(2): 222-8 .
- CP** BLAMBERG, D. L., BLACKWOOD, U. B., SUPPLEE, W. C., and COMBS, G. F. effect of zinc deficiency in hens on hatchability and embryonic development. *PROC SOC EXP BIOL MED* 104:217-220,1960
- Nut def** Blanchard, Raymond and Cousins, Robert J. upregulation of rat intestinal uroguanylin mrna by dietary zinc restriction. *Am. J. Physiol.* (1997) 272(5, Pt. 1): G972-G978.
- CP** Blanchard Raymond K and Cousins Robert J. 1995. differential display of dietary zinc regulated rat intestinal mrnas. *FASEB Journal* 9(4): A866.

- Gene** Blanchard, Raymond K. and Cousins, Robert J. differential display of intestinal mrnas regulated by dietary zinc. *Proc. Natl. Acad. Sci. U. S. A.* (1996) 93(14): 6863-6868
- CP** Blanchard Raymond K and Cousins Robert J. 1996. messenger rna analysis and tissue distribution in the rat of dietary zinc regulated 3' expressed sequence tags. *FASEB Journal* 10(3): A531.
- CP** Blanchard Raymond K(A) and Cousins Robert J. 1997. rat uroguanylin: precursor cdna cloning and regulation of expression by dietary zinc. *FASEB Journal* 11(3): A15.
- No Oral** Blanco-Rodriguez, J. and Martinez-Garcia, C. 1997. in vivo analysis of germ cell apoptosis reveals the existence of stage-specific 'social' control of germ cell death in the seminiferous epithelium. *International Journal of Andrology* 20(6): 373-9.
- Nut def** Blanusa, M., Bremner, I., Schonwald, N., Piasek, M., Kosicek, M., Kostial, K., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. influence of maternal iron deficiency and cadmium exposure on traceelement status of suckling rats. <document title>trace elements in man and animals - tema 8:proceedings of the eighth international symposium on trace elements inman and animals. 955-958.
- BioX** Blatteis, C. M., Bealer, S. L., Hunter, W. S., Llanos-Q, J., Ahokas, R. A., and Mashburn, T. A. Jr. 1983 . suppression of fever after lesions of the anteroventral third ventricle in guinea pigs. *Brain Research Bulletin* 11(5): 519-26.
- Nut def** Blaxter, K. L. 1973. the nutrition of ruminant animals in relation to intensive methods ofagriculture. *Proceedings of the Royal Society of London* 183(No.1073): 321-336.
- No Oral** Blazka, Mark E., Nolan, Canice V., and Shaikh, Zahir A. developmental and sex differences in cadmium distribution and metallothionein induction and localization. *J. Appl. Toxicol.* (1988) 8(3): 217-22.
- No Dose** Bleavins, M. R., Aulerich, R. J., Hochstein, J. R., Hornshaw, T. C., and Napolitano, A. C. 1983. effects of excessive dietary zinc on the intrauterine and postnatal development of mink. *J Nutr.* 113(11): 2360-7.
- No Dose** Blesbois, E. and Mauger, I. zinc content of fowl seminal plasma and its effects on spermatozoa after storage at 4c. *BR POULT SCI. British Poultry Science.* 30 (3). 1989. 677-686.
- FL** Blesbois, E. Institut National de la Recherche Agronomique Monnaie France Centre de Tours Station de Recherches Avicoles. 1990. the function of seminal plasma in the storage of fowl spermatozoa at 4 degrees. <original> role du plasma seminal dans la conservation in vitro du sperme de coq [a 4 degrees]. control of fertility in domestic birds. tours (france), july 2-4 1990. <original> controle de la fertilite chez les oiseaux domestiques. tours (france), 2-4 juillet 1990. *P.* 121-134. No. 54
- CP** Blobel, G., Nakajima, T., Eckner, R., Montminy, M., and Orkin, S. 1998. creb-binding protein cooperates with transcription factor gata-1 and is required for erythroid differentiation. *Vol. 95, No. 5, Pp. 2061-2066* *Proc. Natl. Acad. Sci. Usa*
- Gene** Blobel, G. A., Simon, M. C., and Orkin, S. H. 1995. rescue of gata-1-deficient embryonic stem cells by heterologous gata-binding proteins. *Molecular and Cellular Biology* 15(2): 626-33.
- Drug** Blumenkrantz, Nelly and Hillemann, Georg. metal and anionic macromolecular binding capacity and hair depigmentation in mink by vantocil 1b, a biguanidine polymer. *Acta Agric. Scand.* (1989) 39(2): 217-27 .

- CP** Bluett, J. A. and Bryden, W. L. 1986. influence of antibiotics and oat hulls on the microbial contribution to intestinal contents. *Proceedings of the Nutrition Society of Australia* 11: 127.
- In Vit** Blumcke, S., Kessler, W. D., Niedorf, H. R., Becker, N. H., and Veith, F. J. 1973. ultrastructure of lamellar bodies of type ii pneumocytes after osmium-zinc impregnation. *Journal of Ultrastructure Research* 42(5): 417-33.
- CP** Blumenthal, J. A. S(A), Sandgren, E. P., and Carey, H. V. 1996. intestinal response to overexpression of tgf-alpha in transgenic mice. *Gastroenterology* 110(4 SUPPL.): A792.
- Rev** Blundell, T. L., Bedarkar, S., Wood, S. P., and Sewell, T. 1977. the evolution of a metal binding site. zinc binding of insulin and homologous proteins. *Evol. Metalloenzymes Metalloproteins Relat. Mater., Proc. Symp.* 1-16. Editor(s): Leigh, G. J. Publisher: Sci. Reviews Ltd., London, Engl..
- Surv** Blus, Lawrence, Henny, Charles J., and Mulhern, Bernard M. concentrations of metals in mink and other mammals from washington and idaho. *Environ. Pollut. (1987)* 44(4): 307-18 .
- Food** Bobilya, D. J., Ellersieck, M. R., Gordon, D. T., and Veum, T. L. 1991. bioavailabilities of zinc from nonfat dry milk, low fat plain yogurt, and soy flour in diets fed to neonatal pigs. *Journal of Agricultural and Food Chemistry* 39(7): 1246-1251.
- Abstract** Bobilya, D. J., Johanning, G. L., Krause, G. F., O'dell, B. L., and Veum, T. L. zinc status assessment in neonatal pigs. *73RD ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, NEW ORLEANS, LOUISIANA, USA, MARCH 19-23, 1989. FASEB (FED AM SOC EXP BIOL) J.* 3 (3). 1989. A651.
- Nut def** Bobilya, D. J., Johanning, G. L., Veum, T. L., and O'Dell, B. L. 1994. chronological loss of bone zinc during dietary zinc deprivation in neonatal pigs. *American Journal of Clinical Nutrition* 59(3): 649-653.
- Meth** Bobilya, D. J., Maurizi, M. G., Veum, T. L., and Allen, W. C. 1991. a bone biopsy procedure for neonatal pigs. *Laboratory Animals* 25(3): 222-225.
- Mineral** Bock, Beth C., Kanarek, Robin B., and Aprille, June R. mineral content of the diet alters sucrose-induced obesity in rats. *Physiol. Behav. (1995)* 57(4): 659-68.
- CP** Bockman, R. S., Repo, M. A., Warrell, R. P. Jr, Pounds, J. G., Schidlovsky, G., Gordon, B. M., and Jones, K. W. 1990. distribution of trace levels of therapeutic gallium in bone as mapped by synchrotron x-ray microscopy. *Proceedings of the National Academy of Sciences of the United States of*
- Unrel** Bode, W., Kress, L. F., Meyer, E. F., and Gomis-Ruth, F. X. 1994. the crystal structure of adamalysin ii, a zinc-endopeptidase from the snake venom of the eastern diamondback rattlesnake *crotalus adamanteus*. *Brazilian Journal of Medical and Biological Research* 27(8): 2049-68.
- Unrel** Boden, S. D., Martin, G. J. Jr, Morone, M., Ugbo, J. L., Titus, L., and Hutton, W. C. 1999. the use of coralline hydroxyapatite with bone marrow, autogenous bone graft, or osteoinductive bone protein extract for posterolateral lumbar spine fusion. *Spine* 24(4): 320-7.
- Rev** Bodey, Bela, Bodey, Bela Jr., Siegel, Stuart E., and Kaiser, Hans E. the role of zinc in pre- and postnatal mammalian thymic immunohistogenesis. *In Vivo (1998)* 12(6): 695-722 .
- No COC** Boeckh-Haebisch, Eva Maria Augusta and Oliveira-Filho, Ricardo M. systemic effects of fluoridated water on rats. *Arq. Biol. Tecnol. (1997)* 40(1): 57-68

- Nut def** Boeckner, L. S. and Kies, C. zinc content of selected tissues and taste perception in zinc deficient and zinc adequate rats. *Nutr. Rep. Int.* (1986) 34(6): 921-30
- HHE** Boeckner, L. S. and Kies, C. 1986. zinc nutrition status and growth of middle-class american adolescent children. *Nutrition Reports International* 34(3): 305-314.
- CP** Boehm, J. and Giesecke, D. ed. 1996. organic bound zinc as a feed additive for rats. <original> organisch gebundenes zink im fuetterungsversuch bei ratten. [proceedings of the society of nutrition physiology]. <original> berichte der gesellschaft fuer ernahrungsphysiologieund tier. P. 61. No. 5
- FL** BOEMER, H. metabolism and toxicity of therapeutic chelating agents.11.influence on prenatal development in the rat. *STRAHLENTHERAPIE* 142:349-352,1971
- Mix** Bogden, J. D., Kemp, F. W., Troiano, R. A., Jortner, B. S., Timpone, C., and Giuliani, D. 353-359. elevated renal copper from mercury exposure. *In: Trace Substances in Environmental Health. Hemphill*
- HHE** Bogden, J. D., Oleske, J. M., Lavenhar, M. A., Munves, E. M., Kemp, F. W., Bruening, K. S., Holding, K. J., Denny, T. N., Guarino, M. A., Krieger, L. M., and Holland, B. K. 1988. zinc and immunocompetence in elderly people - effects of zinc supplementation for 3 months . *American Journal Of Clinical Nutrition* 48(3): 655-663.
- HHE** Bogden, J. D., Oleske, J. M., Munves, E. M., Lavenhar, M. A., Bruening, K. S., Kemp, F. W., Holding, K. J., Denny, T. N., and Louria, D. B. 1987. zinc and immunocompetence in the elderly - baseline data on zinc nutriture and immunity in unsupplemented subjects. *American Journal Of Clinical Nutrition* 46(1): 101-109.
- Mix** Bogden, John D., Gertner, Sheldon B., Kemp, Francis W., McLeod, Robbie, Bruening, Kay S., and Chung, Haingsub R. dietary lead and calcium: effects on blood pressure and renal neoplasia in wistar rats. *J. Nutr.* (1991) 121(5): 718-28 .
- Food** Bogomazov, M. Ya. and Garibyan, G. M. the relation of food zinc concentrations to cadmium chloride absorption, distribution, and accumulation under different modes of experimental administration. *Vopr. Pitan.* (1992) (4): 51-3.
- FL** Bokori, J., Fekete, S., Kadar, I., Vetesi, F., and Albert, M. complex study of the physiological role of aluminum. ii. aluminum tolerance tests in broiler chickens. *Acta Vet. Hung.* (1993) 41(3-4): 235-64 .
- No Control** Bokori, J., Fekete, S., and Tolgyesi, Gy. effect of dietary zinc concentration on weight gain, feed utilization, and organic zn levels in broiler chickens. *Acta Agronomica Academiae Scientiarum Hungaricae.* (1984) 33(3-4): 353-62 .
- FL** Bokori, Jozsef, Fekete, Sandor, and Tolgyesi, Gyorgy. effect of the zinc content of feed on the weight gain, feed conversion and on the zinc concentration of various organs in broilers. *Magy. Allatorv. Lapja* (1981) 36(1): 51-6.
- FL** Bolduan, G. 1998. [feeding of weaner piglets without growth promoters?]. <original> fuetterung der absetzferkel ohne leistungsfoerderer? *LAF-Informationen.* V. 6(1) P. 73-80
- FL** Bolduan, G., Schuldt, A., and Hackl, W. 1997. diet feeding in weaner piglets. *Archiv Fur Tierzucht* 40(Supplement): 95-100.
- Nut** ollengier-Lee, S., Mitchell, M. A., Utomo, D. B., Williams, P. E. V., and Whitehead, C. C. 1998.

influence of high dietary vitamin e supplementation on egg production and plasma characteristics in hens subjected to heat stress. *British Poultry Science*. 39(1): 106-112.

- No COC** Boloorforooshan, M. and Markakis, P. zinc supplementation of a bean diet for the rat. *J. Food Sci.* (1977) 42(6): 1671, 1673 .
- Nut def** Bolze, M. S., Reeves, R. D., Lindbeck, F. E., and Elders, M. J. 1987. influence of zinc on growth, somatomedin, and glycosaminoglycan metabolism in rats. *American Journal of Physiology* 252(1 Pt 1): E21-6.
- Nut def** Bolze, M. Sue, Reeves, Robert D., Lindbeck, Frederick E., and Elders, M. Joycelyn. influence of zinc on growth , somatomedin, and glycosaminoglycan metabolism in rats. *Am. J. Physiol.* (1987) 252(1, Pt. 1): E21-E26.
- No Oral** Bon, K., Lanteri-Minet, M., de Pommery, J., Michiels, J. F., and Menetrey, D. 1996. cyclophosphamide cystitis as a model of visceral pain in rats. a survey of hindbrain structures involved in visceroreception and nociception using the expression of c-fos and krox-24 proteins. *Experimental Brain Research. Experimentelle Hirnforschung*.
- Phys** Bondi, A. and Sklan, D. 1984. vitamin a and carotene in animal nutrition. *Progress in Food & Nutrition Science* 8(1-2): 165-91.
- CP** Bondia, S., Jaudi, A., Ribas, B., Santos Ruiz, A., and Sanchez, M. I. 1980. some physiological data in rats exposed to cadmium. *Trace Elem. Anal. Chem. Med. Biol. Proc. Int. Workshop, 1st* : 37-46. Editor(s): Braetter, Peter; Schramel, Peter. Publisher: de Gruyter, Berlin, Fed. Rep. Ger...
- CP** Bondia, S., Ribas, B., De la Torre, A., and Santos Ruiz, A. 1981. zinc and cadmium metalloprotein induced by cadmium administration. *Adv. Physiol. Sci. Proc. Int. Congr., 28th* : Meeting Date 1980, Volume 12, Issue Nutr., Dig., Metab., 71-5. Editor(s): Gati, T.; Szollar, L. G.; Ungvary, Gy. Publisher: Akad. Kiado, Budapest, Hung..
- In Vit** Bonewitz, R. F., Voner, C., and Foulkes, E. C. 1982. uptake and absorption of zinc in perfused rat jejunum: the role of endogenous factors in the lumen. *Nutrition Research* 2(3): 301-307.
- In Vit** Bonewitz, Roland F., Voner, Cathleen, and Foulkes, E. C. uptake and absorption of zinc in perfused rat jejunum: the role of endogenous factors in the lumen. *Nutr. Res. (N. Y.)* (1982) 2(3): 301-7 .
- In Vit** Bonfiglioli, G., Brovotto, P., and Porto, G. 1968. *On the Frozen Polarization of Electroluminescent Cells. SCIENTIFIC-1; AFOSR-69-0779TR*
- Nut def** Bonkovsky, H. L., Healey, J. F., Lincoln, B., Bacon, B. R., Bishop, D. F., and Elder, G. H. 1987. hepatic heme synthesis in a new model of experimental hemochromatosis: studies in rats fed finely divided elemental iron. *Hepatology* 7(6): 1195-203.
- Mix** Bonner, F. W., King, L. J., and Parke, D. V. 1980. the urinary excretion of alkaline phosphatase after the repeated parenteral administration of cadmium to rats given a high dietary supplement of zinc. *Toxicology Letters*. 6 (6): 369-372.
- Bio Acc** Bonner, Frank W., King, Laurence J., and Parke, Dennis V. 1980. the effect of dietary cadmium on zinc, copper and iron levels in the bone of rats. *Toxicol. Lett.* (1980) 5(2): 105-8 .
- Mix** Bonner, Frank W., King, Laurence J., and Parke, Dennis V. the influence of high dietary zinc on

tissue disposition and urinary excretion of cadmium, zinc, copper and iron after repeated parenteral administration of cadmium to rats. *Toxicology* (1981) 19(3): 247-54 .

- Phys** Bonnet, J. J., Benmansour, S., Amejdki-Chab, N., and Costentin, J. 1994. effect of ch3hgcl and several transition metals on the dopamine neuronal carrier; peculiar behaviour of zn2+. *European Journal of Pharmacology* 266(1): 87-97.
- Nut def** Bonomi, A., Bonomi, B. M., and Quarantelli, A. 2000. relationships between the potassium content of the feed ration and zincdeficiency in dairy cows. *Obiettivi e Documenti Veterinari* 21(2): 37-47.
- FL** Bonomi, A., Bosticco, A., Lucchelli, L., Quarantelli, A., Sabbioni, A., and Superchi, P. 1988. contribution to the study of the relation between the amount ofphosphorus in the diet and the appearance of effects due to zincdeficiency in dairy cows. *Zootecnica e Nutrizione Animale* 14(4): 281-294.
- FL** Bonomi, A., Bosticco, A., Quarantelli, A., Sabbioni, A., and Superchi, P. 1988. contribution to the knowledge of the relation between the calciumcontent of the diet and appearance of the effects of zinc deficiency indairy cows. *Zootecnica e Nutrizione Animale* 14(3): 207-221.
- FL** Bonomi, A., Bosticco, A., Quarantelli, A., Sabbioni, A., and Superchi, P. 1988. study of the relation between dietary zinc deficiency and foot diseasein dairy cows. *Zootecnica e Nutrizione Animale* 14(1): 21-34.
- Plant** Bonomi, A., Superchi, P., and Sabbioni, A. 1988-1989. chemical composition and digestibility in vivo of bromus catharticusgrass and hay of different cuts. *Annali Della Facolta Di Medicina Veterinaria, Universita Di Parma* 8-9: 285-301.
- No COC** Bonomi, A. and Vassia, G. 1977. effect of saccharomyces cerevisiae and kluyveromyces fragilis given aslive yeasts on production and quantity and quality of meat in broilers. *Avicoltura* 46(7): 31-46.
- Yeast** Bonomi, A., Vassia, G., and Quarantelli, A. 1977. saccharomyces cerevisiae and kluyeromyces fragilis as live yeasts infeed for meat rabbits (experiment). *Coniglicoltura* 14(7): 27-44.
- Nut** Bonomi, Alberto, Quarantelli, Afro, Superchi, Paola, Sabbiono, Alberto, and Lucchelli, Luigina. the dynamics of feeding amino acid chelates to broilers. *Roles Amino Acid Chelates Anim. Nutr.* (1993) 302-17. Editor: 302-17. Editor(s): Ashmead, H. DeWayne. Publisher: Noyes, Park Ridge, N. J.
- Drug** Bonta, I. L., De Vos, C. J., Grijsen, H., Hillen, F. C., Noach, E. L., and Sim, A. W. 1-hydroxy-3-amino-pyrrolidin-2-one (ha-966). a new .gamma.-aminobutyric acid [gaba]-like compound, with potential use in extrapyramidal diseases. *Brit. J. Pharmacol.* (1971) 43(3): 514-35.
- BioX** Boobis, S. and Hartley, R. E. 1981. measurement of hypozincaemia in mice: a sensitive test for detection of pyrogens. *Clinical Science* 61(4): 445-9.
- Diss** Booker, Lovie King. 1983. effects of iron and zinc supplements on bioavailability of iron, copper, and zinc in young rats fed high fiber diets. *Avail.: Univ. Microfilms Int. Order No. DA8315632 From: Diss. Abstr. Int. B* 1983, 44. 3. 753. 69 pp.
- Abstract** Boonchanawiwat, S., Tongtavee, K., Somsook, S., Honknark, S., Artchawakom, T., and Suasard, K. Shell Co. of Thailand Bangkok Thailand. 1987. efficacy and environmental impact in thailand of flocoumafen, a new rodenticide for rat control in rice fields. 1 P.

- No COC** Boone, David L. and Tsang, Benjamin K. identification and localization of deoxyribonuclease i in the rat ovary. *Biol. Reprod.* (1997) 57(4): 813-821.
- No Oral** Booth, W. D. and Baldwin, B. A. 1980. lack of effect on sexual behaviour or the development of testicularfunction after removal of olfactory bulbs in prepubertal boars. *Journal of Reproduction and Fertility* 58(1): 173-182.
- FL** Booz, K. H., Mootz, W., and Musebeck, K. 1966. [studies of the "osmium-zinc iodide-affinity" elements in the submandibular gland]. <original> untersuchungen an den "osmiumzinkjodid-affinen" elementen in der glandula submandibularis. *Zeitschrift Fur Mikroskopisch-Anatomische Forschung* 75(4): 474-81.
- Nut def** Boquist, L. and Lernmark, A. 1969. effects on the endocrine pancreas in chinese hamsters fed zinc deficient diets. *Acta Pathologica Et Microbiologica Scandinavica* 76(2): 215-28.
- Nut def** Boquist, Lennart and Lernmark, Ake. effects on the endocrine pancreas in chinese hamsters fed zinc-deficient diets. *Acta Pathol. Microbiol. Scand.* (1969) 76(2): 215-28.
- Surv** Borch-Iohnsen, B., Nilssen, K. J., and Norheim, G. 1996. influence of season and diet on liver and kidney content of essential elements and heavy metals in svalbard reindeer. *Biological Trace Element Research* 51(3): 235-247.
- No Dose** Borch-Iohnsen, Berit a, Nilssen, Kjell J, and Norheim, Gunnar. 1996. influence of season and diet on liver and kidney content of essential elements and heavy metals in svalbard reindeer. *Biological Trace Element Research.* 51(3): 235-247.
- Prim** Borda, P. M. R. 1971. new aspects of the bio-ecology of triatoma infestans klug, 1834 and itsnatural enemy telenomus fariai lima, 1927. brief notes relating totrypanosoma cruzi chagas, 1909. *Revista Peruana De Entomologia* 14(2): 379-385.
- Mix** Bordas, E. 1980. experimental studies on the toxic effects of a complex of heavy metals including cd, pb, zn, cu and fe, from a surface water source. *IGIENA* VOL. 29, NO. 1: pp. 17-22.
- FL** Bordas, E., Bretter, Edit, Ghelberg, N. W., and Costin, Ileana. 1980. experimental studies on the toxic effects of a complex of heavy metals including cadmium lead, zinc, copper, and iron from a surface water source. *Rev. Ig. Bacteriol., Virusol., Parazitol., Epidemiol., Pneumoftiziol., Ig.* 29(1): 17-22.
- Nut def** Bordas, E., Nagy, S., Gabor, S., and Papilian, V. V. deficient fecundation in rats deprived of copper. *REV ROUM BIOL SER BIOL ANIM. Revue Roumaine De Biologie Serie De Biologie Animale.* 27 (2). 1982 (Recd. 1983). 111-114.
- No COC** Bordas, J., Dodson, G. G., Grewe, H., Koch, M. H. J., Krebs, B., and Randall, J. a comparative assessment of the zinc protein coordination in 2 zinc insulin as determined by x-ray absorption fine structure and x-ray crystallography. *PROC R SOC LOND B BIOL SCI. Proceedings of the Royal Society of London B Biological Sciences.* 219 (1214). 1983. 21-40.
- In Vit** Borden, K. L., CampbellDwyer, E. J., and Salvato, M. S. 1997 . the promyelocytic leukemia protein pml has a pro-apoptotic activity mediated through its ring domain. *FEBS Letters* 418(1-2): 30-4.
- No COC** Borders, C. L. Jr and Fridovich, I. 1985. a comparison of the effects of cyanide hydrogen peroxide and phenylglyoxal on eukaryotic and procaryotic copper zinc superoxide dismutases. *Archives of Biochemistry and Biophysics.* 241(2): 472-476.

- Nut** Borg, B. S., Libal, G. W., and Wahlstrom, R. C. 1987. tryptophan and threonine requirements of young pigs and their effect on serum calcium, phosphorus and zinc concentrations. *Journal of Animal Science* 64(4): 1070-1078.
- Nut** Borges Renee M. 1992. a nutritional analysis of foraging in the malabar giant squirrel (*ratufa indica*). *Biological Journal of the Linnean Society* 47(1): 1-21.
- Nut def** Boron, B., Hupert, J., Barch, D. H., Fox, C. C., Friedman, H., Layden, T. J., and Mobarhan, S. 1988. effect of zinc deficiency on hepatic enzymes regulating vitamin a status. *The Journal Of Nutrition*. 118(8): 995-1001.
- Nut def** Boron, Burton, Hupert, Jordan, Barch, David H., Fox, Colleen C., Friedman, Howard, Layden, Thomas J., and Mobarhan, Sohrab. effect of zinc deficiency on hepatic enzymes regulating vitamin a status. *J. Nutr.* (1988) 118(8): 995-1001.
- Carcin** Borovansky, J., Riley, P. A., Vrankova, E., and Necas, E. 1984. the effect of zinc on mouse melanoma growth-in vitro and in vivo. *Yale Journal of Biology and Medicine* 57: 338.
- Gene** Borycki, A. G., Mendham, L., and Emerson, C. P. Jr. 1998. control of somite patterning by sonic hedgehog and its downstream signal response genes. *Development* 125(4): 777-90.
- Mix** Boscolo, P., Carmignani, M., Menini, E., Porcelli, G., Ranieri, G., Ripanti, G., and Sciamanna, V. urinary vanillylmandelic acid and kallikrein and cardiovascular parameters in rats chronically exposed to different toxic metals. *Acta Med. Rom.* (1985) 23(2): 208-15.
- No COC** Boscolo, P., Carmignani, M., Sacchettoni-Logroscino, G., and Carelli, G. cardiovascular and renal effects of mercury exposure in rats. *Heavy Met. Hydrol. Cycle* (1988) 3-10. Editor: 3-10. Editor(s): Astruc, M.; Lester, John Norman. Publisher: Selper Ltd., London, UK. CODEN: 56OSAR.
- Nut def** Bose, Shambhunath, Mukhopadhyay, Banibrata, Chaudhury, Shibani, and Bhattacharya, Shelley. correlation of metal distribution, reduced glutathione and metallothionein levels in liver and kidney of rat. *Indian J. Exp. Biol.* (1994) 32(9): 679-81.
- Gene** Bosma, A. A. and Kroneman, J. 1979. chromosome studies in cattle with hereditary zinc deficiency (lethal trait a46). *Veterinary Quarterly* 1(3): 121-125.
- Gene** Bosma, A. A., Mannaerts, B. M. J. L., Haan, N. A. de, and Kroneman, J. 1988. sister chromatid exchanges in calves with hereditary zinc deficiency (lethal trait a 46). *Veterinary Quarterly* 10(4): 230-233.
- Mineral** Bosque, M. A., Domingo, J. L., Paternain, J. L., Llobet, J. M., and Corbella, J. evaluation of the developmental toxicity of 2,3-dimercapto-1-propanesulfonate (dmpps) in mice . effect on mineral metabolism. *Toxicology* (1990) 62(3): 311-20 -483X.
- Unrel** Botos, Istvan, Meyer, Erik, Swanson, Stanley M., Lemaitre, Vincent, Eeckhout, Yves, and Meyer, Edgar F. structure of recombinant mouse collagenase-3 (mmp-13). *J. Mol. Biol.* (1999) 292(4): 837-844.
- Phys** Botros, H. G., Birkenmeier, G., Otto, A., Kopperschlager, G., and Vijayalakshmi, M. A. 1991. immobilized metal ion affinity partitioning of cells in aqueous two-phase systems: erythrocytes as a model. *Biochimica Et Biophysica Acta* 1074(1): 69-73.
- CP** Boudey M(A), Read, M. H., Mallet, M., Bureau, F., Arhan, P., and Bougle D(A). 1996. quantitative analysis of protoporphyrin zinc during iron replenishment in iron-deficient rats:

comparative analysis with hemograms and reserves. *Archives of Physiology and Biochemistry* 104(4): D113.

- Mix** Bougle, D., Isfaoun, A., Bureau, F., Neuville, Dominique, Jauzac, Philippe, and Arhan, Pierre. long-term effects of iron: zinc interactions on growth in rats. *Biol. Trace Elem. Res.* (1999) 67(1): 37-48
- No COC** Bougon, M. and L'Hospitalier, R. 1976. effect of zinc bacitracin on the performance of chickens. *Bulletin D'Information Station Experimentale D'Aviculture De Ploufragan* 16(No.3): 111-115.
- FL** Bougon, M., Protais, J., Odje, O., Launay, M., and Menec, M. le. 1988. performance of laying hens and egg quality after a moult. *Bulletin D'Information, Station Experimentale D'Aviculture De Ploufragan, France* 28(3): 105-109.
- No COC** Bougon, M. Ministere de l'Agriculture 22 Ploufragan France Services Veterinaires. Station Experimentale d'Aviculture. 1979. [influence of bacitracin-zinc on laying hen performance [feed additive]]. <original> influence de la bacitracine-zinc sur les performances des pondeuses [additif alimentaire]. *Industries De L'Alimentation Animale.* (No.322) P. 31-36
- BioX** Boulay, M., Scott, M. E., Conly, S. L., Stevenson, M. M., and Koski, K. G. dietary protein and zinc restrictions independently modify a heligmosomoides polygyrus (nematoda) infection in mice. *Parasitology* (1998) 116(5): 449-462.
- CP** Boulay Marjolaine, Koski, K. G., Scott, M. E., and Stevenson, M. 1994. effects of protein and zinc deficiencies on heligmosomoides polygyrus infection in mice. *FASEB Journal* 8(4-5): A950.
- FL** Bouquegneau, J. M., Debacker, V., Antoine, N. Liege Univ. Belgium Inst. de Chimie. Lab. d'Océanologie, Coignoul, F., Holsbeek, L., Jauniaux, T., Tapia, G., and Joiris, C. 1994. causes of mortality and heavy metals content of guillemots uria aalge stranded along the belgian coast. <original> causes de mortalite et teneur en metaux lourds de guillemots de troil uria aalge echoues le long du littoral belge. *Bulletin De La Societe Royale Des Sciences De Liege.* V. 63(1-2) P. 211-217
- Fate** Bourcier, D. R., Sharma, R. P., and Brinkerhoff, C. R. 1981. cadmium-copper interaction: tissue accumulation and subcellular distribution of cadmium in mice after simultaneous administration of cadmium and copper. *Trace Subst. Environ. Health* : 15, 190-7 .
- Mix** Bourcier, Denis R., Sharma, Raghubir P., Bracken, William M., and Taylor, Michael J. 1982. cadmium-copper interaction: effect of copper pretreatment and cadmium-copper chronic exposure on the distribution and accumulation of cadmium, copper, zinc and iron in mice. *Trace Subst. Environ. Health* : 16, 273-9 .
- Surv** Bourne, W. R. P. the mass mortality of common murre in the irish sea in 1969. *J. Wildl. Manage.* 40(4): 789-792 1976 (35 References)
- FL** Bouska, J., Kukla, J. Stanice Veterinarni Pece Hustopece Czechoslovakia, and Lazar, V. 1988. dynamics of changes in selected biochemical parameters of the blood plasma of geese depending on their age, sex and egg laying. <original> dynamika zmen vybranych biochemickych ukazatelu krevni plasmy hus v zavislosti na veku, pohlavi a snasce. *Biologizace a Chemizace Zivocisne Vyroby - Veterinaria.* V. 24(6) P. 517-528
- FL** Bowyer, R. C., Jehanli, A. M., Patel, G., and Hermon-Taylor, J. 1991. development of enzyme-linked immunosorbent assay for free human pro-colipase activation peptide (apgpr). *Clinica Chimica Acta; International Journal of Clinical Chemistry*; 200

- HHE** Bowyer, R. C., Jehanli, A. M. T., Patel, G., and Hermon-Taylor, J. development of elisa for free human pro-colipase activation peptide apgpr. *CLIN CHIM ACTA. Clinica Chimica Acta.* 200 (2-3). 1991. 137-152.
- BioX** Bowzard, J. B., Bennett, R. P., Krishna, N. K., Ernst, S. M., Rein, A., and Wills, J. W. 1998. importance of basic residues in the nucleocapsid sequence for retrovirus gag assembly and complementation rescue. *Journal of Virology* 72(11): 9034-44.
- Unrel** Boyd, J. W. 1972. the relationship between serum immune globulin deficiency and disease in calves: a farm survey. *Veterinary Record* 90(23): 645-649.
- Mineral** Boza, Julio J., Fox, Thomas E., Eagles, John, Wilson, Peter D. G., and Fairweather-Tait, Susan J. the validity of extrinsic stable isotopic labeling for mineral absorption studies in rats. *J. Nutr.* (1995) 125(6): 1611-16.
- Nut** Bracker, M. D., Hollingsworth, J. W., Saltman, P. D., Strause, L. G., Klauber, M. R., and Lugo, N. J. 1988. failure of dietary zinc supplementation to improve the antibody-response to influenza vaccine. *Nutrition Research* 8(1): 99-104.
- Org Met** Bradbury, J. H., Ramesh, V., and Dodson, G. pmr study of the histidine residues of insulin. *Journal of Molecular Biology.* 150 (4). 1981. 609-614.
- Org Met** Bradfield, A. A. and Gill, J. E. 1984. laboratory trials of five rodenticides for the control of mesocricetus auratus waterhouse. *Journal of Hygiene* 93(2): 389-94 .
- Org Met** Bradfield, A. A. G. and Gill, J. E. laboratory trials of 5 rodenticides for the control of mesocricetus-auratus. *J HYG. Journal of Hygiene.* 93 (2). 1984. 389-394.
- No COC** Bradfield, A. A. G. and Gill J. E. 1984. laboratory trials of five rodenticides for the control of mesocricetus auratus waterhouse. *J.Hyg.* 93(2): 389-394.
- No Dose** Brady, F. O. 1983. metabolism of zinc and copper in the neonate: zinc thionein in developing rat brain, heart, lung, spleen, and thymus. *Life Sciences* 32(26): 2981-7.
- Fate** Brady, F. O. and Webb, M. 1981. metabolism of zinc and copper in the neonate. (zinc, copper)-thionein in the developing rat kidney and testis. *Journal of Biological Chemistry* 256(8): 3931-5.
- Rev** Brady, F. O., Webb, M., and Mason, R. 1982. zinc and copper metabolism in neonates: role of metallothionein in growth and development in the rat. *Developments in Toxicology and Environmental Science* 9: 77-98.
- No Tox** Brady, Frank O. metabolism of zinc and copper in the neonate: zinc thionein in developing rat brain, heart, lung, spleen, and thymus. *Life Sci. (1983)* 32(26): 2981-7 .
- Mix** Brady, Frank O. and Webb, Michael. metabolism of zinc and copper in the neonate. (zinc,copper)-thionein in the developing rat kidney and testis. *J. Biol. Chem. (1981)* 256(8): 3931-5 .
- Rev** Brady, Frank O., Webb, Michael, and Mason, Richard. zinc and copper metabolism in neonates: role of metallothionein in growth and development in the rat. *Dev. Toxicol. Environ. Sci. (1982)* 9(Biol. Roles Metallothionein): 77-98 .
- Unrel** Brady, J. P., Duncan, M. K., Wawrousek, E. F., and Piatigorsky, J. 1997. the transcription factor, kid-1, is highly expressed in both eye and kidney of the mouse [letter].

- CP** Brafford, P. A. and Rothstein, J. L. 1997. a novel embryonic dna-binding protein involved in hematopoiesis. *Journal of Allergy and Clinical Immunology* 99(1 PART 2): S505.
- Nut def** Braga-Costa, T. M., De-Oliveira, L. M., and Vannucchi, H. effect of zinc deficiency induced before and during pregnancy on the survival of female rats and their pups. *Braz. J. Med. Biol. Res.* (1995) Volume Date 1995, 28(5): 569-74.
- No Oral** Brain, P. F., Goldsmith, J. F., Parmigiani, S., and Mainardi, M. involvement of various senses in responses to individual housing in laboratory albino mice 1. the olfactory sense. *BOLL ZOOL. Bollettino Di Zoologia.* 49 (3-4). 1982 (1983) (Recd. 1984). 213-222.
- Bio Acc** Brake, J. 1993. recent advances in induced molting. *Poultry Science* 72(5): 929-931.
- CP** Brake, J. and Baldwin, C. D. effect of bacitracin zinc on broiler breeders. 79TH ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC., BLACKSBURG, VIRGINIA, USA, MAY 1990. *POULT SCI.* 69 (Suppl. 1). 1990. 23.
- CP** Bramlage, L. R. 1991. dietary considerations in the development of osteochondrosis. *Publication - Veterinary Continuing Education, Massey University.* (No.135) P. 7-11
- Unrel** Bramson, P. E. and Corley, J. P. 1972. *Environmental Status of the Hanford Reservation for 1971*
- Unrel** Bramson, P. E., Corley, J. P., and Nees, W. L. 1973. *Environmental Status of the Hanford Reservation for CY-1972*
- Unrel** Branam, J. E. 1987. dietary management of geriatric dogs and cats. *Veterinary Technician* 8(10): 501-503.
- Diss** Branche, Olatunde Patrick. 1988. the effects of zinc supplementation on the pathogenesis of schistosoma mansoni infection in balb/cj mice. .*Avail.: Univ. Microfilms Int. Order No. DA8914215 From: Diss. Abstr. Int. B* 1989, 50. 4. 1196. 121 pp.
- Phys** Brand, I. A. and Heinickel, A. key enzymes of carbohydrate metabolism as targets of the 11.5-kda zinc-binding protein parathymosin. *J BIOL CHEM. Journal of Biological Chemistry.* 266 (31). 1991. 20984-20989.
- In Vit** Brand, I. A. and Kleineke, J. 1996. intracellular zinc movement and its effect on the carbohydrate metabolism of isolated rat hepatocytes. *The Journal Of Biological Chemistry.* 271(4): 1941-1949.
- Surv** Brand, T. S., Brand, A. A., Cloete, S. W. P., and Durand, A. untreated urea-enriched and thermal-ammoniated oat grain as supplementary feed for pregnant and lactating south african mutton merino ewes grazing wheat stubble. *Suid-Afrikaanse Tydskrif Vir Veekunde.* 22 (2). 1992. 58-63.
- No Oral** Brandes, J. S. insulin induced over eating in the rat. *PHYSIOL BEHAV. Physiology & Behavior.* 18 (6). 1977 1095-1102.
- No Oral** Brands, B., Baskerville, J. C., Hirst, M., and Gowdey, C. W. 1980. zinc tannate salts of heroin, laam and hydromorphone attenuate opiate withdrawal syndrome. *Psychopharmacology* 68(3): 311-4.
- No Dose** Brandt, A. Statens Husdyrbrugsforsoeg Hilleroed Denmark. 1983. effect of dietary copper and zinc on the haematology of male pastel mink kits: a pilot investigation [iron, fe, blood plasma analysis, 300 ppm copper per kg wet feed highly toxic to mink]. *Scientifur.* V. 7(2) P. 61-65

- Food** Brandt, R. B., Doyle, B. A., Chan, W., Poland, J. L., and Seibel, H. R. 1997. the effects of running stress on plasma vitamin a levels in rats. *Food And Chemical Toxicology : An International Journal Published For The British Industrial Biological Research Association*. 35(5): 459-463.
- HHE** Brannen, P. C. and Beswick, P. H. 1986. the effect of zinc on stimulated superoxide production in human-neutrophils - dependence on the method employed. *Biochemical Society Transactions* 14: 878-879.
- CP** Brannstrom T(A), Ernhill K(A), Marklund, S., and Nilsson, P. 1998. transgenic mice homozygotic for the asp90ala human sod1 mutation develop als clinically and histologically. *Society for Neuroscience Abstracts* 24(1-2): 486.
- No COC** Braude, R. and Hosking, Z. D. 1975. feed additives to diets supplemented with copper for growing pigs. *Journal of Agricultural Science, UK* 85(2): 263-266.
- Org Met** Brauer, G. M. and Stansbury, J. W. 1984. cements containing syringic-acid esters o ethoxy benzoic-acid and zinc oxide. *Journal of Dental Research*. 63(2): 137-140.
- Drug** Bravo, L., Escolar, G., Navarro, C., Fontarnau, R., and Bulbena, O. 1990. effect of zinc acexamate on gastric lesions induced by aspirin: a morphological study. *European Journal of Pharmacology* 190(1-2): 59-65.
- FL** Bravo Ojeda, Marco Antonio. 1995. [influence of cooper and zinc in diets for growing goats]. <original> influencia del cobre y cinc en dietas para cabras en crecimiento. 68 P.
- Nut def** Bray, Tammy M., Kubow, Stan, and Bettger, William J. effect of dietary zinc on endogenous free radical production in rat lung microsomes. *J. Nutr.* (1986) 116(6): 1054-60
- Meth** Braye, F., Weber, G., Irigaray, J. L., and Frayssinet P(A). 1997. osseointegration in cortical sheep bone of calcium phosphate implants evaluated by pixe method and histology. *Journal of Biomedical Materials Research* 36(3): 315-324.
- Acu** Brazeau, P. and Martin, J. B. analogs of somatostatin. part b. in vivo activities: prolongation of action with protamine zinc. *Curr. Top. Mol. Endocrinol.* (1976) 3(Hypothal. Endocr. Funct., [Proc. Int. Symp., 1975]): 379-86 .
- Alt** Breeding, S. W., Berry, W. D., and Brake, J. maintenance of duodenum weight during a molt induced by dietary zinc in a low-calcium diet *Poultry Science*. 71 (8). 1992. 1408-1411.
- Nut def** Breeding, S. W., Berry, W. D., and Brake, J. 1992. research note: maintenance of duodenum weight during a molt induced by dietary zinc in a low-calcium diet. *Poultry Science* 71(8): 1408-1411.
- CP** Breeding, S. W. and Brake, J. effects of dietary zinc in the absence of supplemental dietary calcium on an induced molt of scwl hens. *NINTH ANNUAL MEETING OF THE SOUTHERN POULTRY SCIENCE SOCIETY. POULT SCI.* 67 (Suppl. 1). 1988. 5.
- Nut def** Breeding, S. W., Brake, J., Garlich, J. D., and Johnson, A. L. 1992. molt induced by dietary zinc in a low-calcium diet. *Poult. Sci.* 71(1): 168-80 .
- Unrel** Breen, K. C. and Regan, C. M. 1988. developmental control of n-cam sialylation state by golgi sialyltransferase isoforms. *Development* 104(1): 147-54.
- HHE** Breitschwerdt, E. B., Armstrong, P. J., Robinette, C. L., Dillman, R. C., Karl, M. L., and Lowry,

- E. C. 1986. 3 cases of acute zinc toxicosis in dogs. *Veterinary And Human Toxicology* 28(2): 109-117.
- FL** Brem, G., Brenig, B., Goodman, H. M., Selden, R. C., Graf, F., Kruff, B., Springmann, K., Hondele, J., Meyer, J., Winnacker, E. L., and Krausslich, H. 1985. production of transgenic mice, rabbits and pigs by microinjection intopronuclei. *Zuchthygiene* 20(5): 251-252.
- Abstract** BREMERT, J. C., DREOSTI, I. E., and TULSI, R. S. a dietary interaction between deficiencies of folic acid and zinc on embryonic development in rats. *TERATOLOGY* 40(3):261,1989
- Nut def** Bremert, J. C., Dreosti, I. E., and Tulsi, R. S. 1989. a teratogenic interaction between dietary deficiencies of zinc and folic acid in rats : an electron microscope study. *Nutr. Res. (N. Y.)* 9(1): 105-12.
- In Vit** Bremner, I. 1976. the relationship between the zinc status of pigs and the occurrence of copper binding and zinc binding proteins in liver. *British Journal of Nutrition*. 35(2): 245-252.
- Nut def** Bremner, I. 1976. the relationship between the zinc status of pigs and the occurrence ofcopper- and zn-binding proteins in liver. *British Journal of Nutrition* 35(2): 245-252.
- Mix** Bremner, I. and Campbell, J. K. 1978. effect of copper and zinc status on susceptibility to cadmium intoxication. *Environ Health Perspect.* 25: 125-128.
- Nut def** Bremner, I. and Davies, N. T. 1976. studies on the appearance of a hepatic copper-binding protein inand zinc-deficient rats. *British Journal of Nutrition* 36(1): 101-112.
- No Oral** Bremner, I., Hoekstra, W. G., Davies, N. T., and Young, B. W. metabolism of sulfur-35 labeled copper thionein zinc thionein and cadmium thionein in the rat. *Chemico-Biological Interactions.* 23 (3). 1978. 355-368.
- No COC** Bremner, I., Mehra, R. K., and Sato, M. 1987. metallothionein in blood, bile and urine. *EXS* 52: 507-17.
- CP** Bremner, I., Morrison, J. N., and Wood, A. M. metallothionein concentrations in the blood and urine of streptozotocin treated rats. *Trace Elements In Man And Animals 6 / Edited By Lucille S. Hurley, ... [Et Al.].* p. 681-682.
- BioX** Bremner, I., Morrison, J. N., Wood, A. M., and Arthur, J. R. 1987. effects of changes in dietary zinc, copper and selenium supply and of endotoxin administration on metallothionein i concentrations in blood cells and urine in the rat. *The Journal Of Nutrition.* 117(9): 1595-1602.
- Nut def** Bremner, I., Williams, Richard Bell, and Young, Brian W. 1981. the effects of age, sex, and zinc status on the accumulation of (copper, zinc)-metallothionein in rat kidneys. *J. Inorg. Biochem.* 14(2): 135-46 .
- CP** Bremner, Ian and Davies, Neill T. 1974. zinc proteins in rat liver. *Trace Elem. Metab. Anim. Proc. Int. Symp., 2nd* : Meeting Date 1973, 493-6. Editor(s): Hoekstra, W. G. Publisher: Univ. Park Press, Baltimore, Md..
- No Oral** Bremner, Ian, Morrison, James N., Wood, Anne M., and Arthur, John R. effects of changes in dietary zinc, copper and selenium supply and of endotoxin administration on metallothionein i concentrations in blood cells and urine in the rat. *J. Nutr. (1987)* 117(9): 1595-602
- Nut** Bremner, Ian, Wood, Anne M., Noble, Nancy A., and Robertson, Aileen. assessment of nutritional status by immunoassay of metallothionein. *Metallothionein Biol. Med. (1991)* 323-

38. Editor: 323-38. Editor(s): Klaassen, Curtis D.; Suzuki, Kazuo T. Publisher: CRC, Boca Raton, Fla..

- CP** Brenckle, L. B. and Rasmussen, A. I. 1986. effect of marginal dietary zinc on blood fractions of rats. *Federation Proceedings* 45: 1082.
- Phys** Brenner, G. M. and Koo, S. I. effect of different dosages of estradiol on copper and zinc status and on high density lipoproteins in ovariectomized rats. *J TRACE ELEM EXP MED. Journal of Trace Elements in Experimental Medicine*. 3 (1). 1990. 55-66.
- No COC** Brenner, G. M. and Koo, S. I. 1988. estradiol-induced increase in serum high-density lipoproteincholesterol and its relationships with zinc and copper status in ovariectomized rats. *Hormone and Metabolic Research* 20(9): 597-599.
- FL** Brentrup H(A), Luttel H(A), and Bunge, J. 1996. effects of zinc-methionine complex on the performance of dairy cows and somatic cell counts in milk. *Tieraerztliche Umschau* 51(9): 559-566.
- HHE** Breskin, M. W., Worthingtonroberts, B. S., Knopp, R. H., Brown, Z., Plovie, B., Mottet, N. K., and Mills, J. L. 1983. 1st trimester serum zinc concentrations in human-pregnancy. *American Journal Of Clinical Nutrition* 38(6): 943-953.
- Drug** Brewer, G. J., Hill, G. M., Prasad, A. S., Cossack, Z. T., and Rabbani, P. 1983. oral zinc therapy for wilsons-disease. *Annals Of Internal Medicine* 99(3): 314-320.
- CP** Brewer, George J., Bereza, Ulana, Kretzchmar, Peter, Brewer, Lucia F., and Aster, Jon C. 1982. molecular mechanism of zinc action, and a note on the treatment of sle in the mouse with zinc. *Inflammatory Dis. Copper [Proc. Symp.]* : Meeting Date 1981, 529-42. Editor(s): Sorenson, John R. J. Publisher: Humana, Clifton, N. J. CODEN: 49ELAY.
- CP** Briceno-Valero, J. and Gronsky, R. 1982. *Pre-Precipitation Phenomena at Grain Boundaries*. LBL-13820; CONF-810860-9
- Phys** Bricker, B. J., Tabatabai, L. B., Judge, B. A., Deyoe, B. L., and Mayfield, J. E. cloning expression and occurrence of the brucella copper zinc superoxide dismutase. *INFECT IMMUN. Infection and Immunity*. 58 (9). 1990. 2935-2939.
- Nut def** Bridges, C. H. and Harris, E. D. 1988. experimentally induced cartilaginous fractures (osteocondritisdissecans) in foals fed low-copper diets. *Journal of the American Veterinary Medical Association* 193(2): 215-221.
- Unrel** Bridges, C. H. and Moffitt, P. G. 1990. influence of variable content of dietary zinc on copper metabolism of weanling foals. *American Journal of Veterinary Research* 51(2): 275-280.
- Nut def** Bridges, C. H., Womack, J. E., Harris, E. D., and Scrutchfield, W. L. 1984. considerations of copper metabolism in osteochondrosis of suckling foals. *Journal of the American Veterinary Medical Association* 185(2): 173-178.
- CP** Brightwell J(A), Magaha J(A), Flinn J(A), Chandhoke, V., and Jones, B. 1999. enhanced levels of zinc in drinking water adversely affect spatial learning in rats. *Society for Neuroscience Abstracts*. 25(1-2): 1829.
- IMM** Brin, M. F. 1997. botulinum toxin: chemistry, pharmacology, toxicity, and immunology. *Muscle & Nerve* 6: S146-68.

- No Oral** Briner, W. E. and Ball, J. D. 1996. the effect of zinc on spina bifida produced by gaba agonists in the rat. *Met. Ions Biol. Med. Proc. Int. Symp., 4th* : 393-395. Editor(s): Collery, Philippe. Publisher: Libbey Eurotext, Montrouge, Fr..
- Org Met** Brinkhaus, F., Mann, J., Zorich, C., and Greaves, J. A. 1998. bioavailability of zinc propionate in dogs. *Journal of Nutrition* 128(12 Suppl): 2596S-2597S.
- Phys** Briske-Anderson, M. and Kramer, T. R. influence of zinc on bcg cell wall skeleton induced suppression of concanavalin a stimulated dna synthesis of rat splenic t-lymphocytes. *NUTR RES. Nutrition Research.* 10 (6). 1990. 635-646.
- Bact** Briske-Anderson, Mary and Kramer, Tim R. influence of zinc on bacillus calmette-guerin cell wall skeleton induced suppression of concanavalin-a stimulated dna-synthesis of rat splenic t-lymphocytes. *Nutr. Res. (N. Y.)* (1990) 10(6): 635-46.
- Nut def** Brody, M. S., Steinberg, J. R., Svingen, B. A., and Luecke, R. W. increased purine nucleotide cycle activity associated with dietary zinc deficiency. *Biochem. Biophys. Res. Commun.* (1977) 78(1): 144-50
- Nut def** Brody, M S, Steinberg, J R, Svingen, B A, and Luecke, R W. increased purine nucleotide cycle activity associated with dietary zinc deficiency [rats]. *Biochem Biophys Res Commun* Sept 9, 1977 78 (1): 144-150. Ref.
- Nut def** Broek, A. H. M. van den and Thoday, K. L. 1986. skin disease in dogs associated with zinc deficiency: a report of fivecases. *Journal of Small Animal Practice* 27(5): 313-323.
- Abstract** BROGAN, W. C III, CURTO, K. A., and THOMAS, J. A. 1982. enhancement of iron induced testicular lipid per oxidation by di-2 ethylhexyl phthalate or dietary zinc deficiency. 66TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY
- Alt** Brommage, Robert, Binacua, Claudine, and Carrie, Anne Lise. ovulation-associated increase in intestinal calcium absorption during the rat estrous cycle is blunted by ovariectomy. *Biol. Reprod.* (1993) 49(3): 544-8 .
- FL** Bronsch, K., Schneider, D., and Rigal-Antonelli, F. 211. olaquinox, a new growth promoter in animal nutrition. 1.in rearing piglets. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde*
- FL** Bronsch, K., Schneider, D., and Rigal-Antonelli, F. olaquinox a new growth promoting feed additive part 1 the effect on piglet rearing. *Z TIERPHYSIOL TIERERNAEHR FUTTERMITTELKD. Zeitschrift Fuer Tierphysiologie Tierernaehrung Und Futtermittelkunde.* 36 (4). 1976 211-221.
- CP** Brookes, G. B. and Lilly, D. J. the effects of acute zinc deficiency on the function of the cochlea in the albino rat. *MEETING OF THE OTO-RHINO-LARYNGOLOGICAL RESEARCH SOCIETY, BIRMINGHAM, ENGLAND, APR. 19, 1985. CLIN OTOLARYNGOL.* 10 (5). 1985 (Recd. 1986). 290-291.
- Nut def** Brooks, D. and Singh, J. interactions of carbon monoxide exposure and zinc deficiency on fetal anomalies in protein-deficient mice. *Teratology* 1997 Jan;55(1):56
- Org Met** Brooks, J. E. and Htun, P. T. 1980. laboratory evaluation of scilliroside used as a rodenticide against the lesser bandicoot rat, bandicota bengalensis. *Journal of Hygiene* 85(2): 227-34.

- Phys** Brosvic, G. M., Slotnick, B. M., and Henkin, R. I. 1992. decreased nacl sensitivity in zinc-deprived rats. *Physiology & Behavior*. 52(3): 527-533.
- Phys** Brosvic, G. M., Slotnick, B. M., and Henkin, R. I. decreased sodium chloride sensitivity in zinc-deprived rats. *PHYSIOL BEHAV. Physiology & Behavior*. 52 (3). 1992. 527-533.
- Phys** Brouette-Lahlou, I., Godinot, F., and Vernet-Maury, E. 1999. the mother rat's vomeronasal organ is involved in detection of dodecyl propionate, the pup's preputial gland pheromone. *Physiology & Behavior* 66(3): 427-36.
- Gene** Brown David R, Qin Kefeng, Herms Jochen W, Madlung Axel, Manson Jean, Strome Robert, Fraser Paul E, Kruck Theo, Von Bohlen Alex, Schulz-Schaeffer Walter, Giese Armin, Westaway David, and Kretzschmar Hans= (A). 1997. the cellular prion protein binds copper in vivo. *Nature (London)* 390(6661): 684-687.
- Unrel** Brown, E. D., Calhoun, N. R., Larson, R. H., and Smith, J. C. Jr. 1979. an effect of zinc deficiency on dental caries. *Life Sciences* 24(22): 2093-2098.
- Nut def** Brown, E. D., Penhos, J. C., Recant, L., and Smith, J. C. Jr. 1975. glucose tolerance, plasma and pancreatic insulin levels in zincdeficient rats. *Proceedings of the Society for Experimental Biology and Medicine* 150(3): 557-560.
- Unrel** Brown, Ellen D., Calhoun, Noah R., Larson, Rachel H., and Smith, J. Cecil Jr. an effect of zinc deficiency on dental caries. *Life Sci. (1979)* 24(22): 2093-7
- Nut def** Brown, Ellen D., Chan, Winnie, and Smith, J. Cecil Jr. bone mineralization during a developing zinc deficiency. *Proc. Soc. Exp. Biol. Med. (1978)* 157(2): 211-14.
- Nut def** Brown, Ellen D., Chan, Winnie, and Smith, J. Cecil Jr. vitamin a metabolism during the repletion of zinc deficient rats. *J. Nutr. (1976)* 106(4): 563-8.
- CP** BROWN, G., HUNT, V., WAN, J., and GRIMBLE, R. F. 1986. the differing responses of zinc and protein metabolism to escherichia-coli endotoxin in rats fed on diets containing maize coconut and fish oils. *FOUR HUNDRED AND THIRTIETH MEETING OF THE NUTRITION SOCIETY*
- Abstract** BROWN, J. M. the protective effect of zinc chloride on acetazolamide teratogenesis in the icr/sim mouse. *TERATOLOGY* 27(2):33A-34A,1983
- Anat** Brown, M. C. and Hopkins, W. G. 1981. role of degenerating axon pathways in regeneration of mouse soleus motor axons. *Journal of Physiology (London)*. 318(0): 365-374 .
- No COC** Brown Oscar A, Sosa Yolanda E, Dardenne Mireille, Pleau Jean-Marie, and Goya Rodolfo G(A). 1999. growth hormone-releasing activity of thymulin on pituitary somatotropes is age dependent. *Neuroendocrinology* 69(1): 20-27.
- No COC** Brownie, C. F., Brownie, C., Noden, D., Krook, L., Haluska, M., and Aronson, A. L. 1986. teratogenic effect of calcium edetate (caedta) in rats and the protective effect of zinc. *Toxicology And Applied Pharmacology* 82(3): 426-443.
- Food** Browning, J. D., MacDonald, R. S., Thornton, W. H., and O'Dell, B. L. 1998. reduced food intake in zinc deficient rats is normalized by megestrol acetate but not by insulin-like growth factor-i. *Journal of Nutrition* 128(1): 136-42.
- Nut def** Browning, J. D. and O'Dell, B. L. 1995. zinc deficiency decreases the concentration of n-methyl-d-aspartate receptors in guinea pig cortical synaptic membranes. *Journal of Nutrition* 125(8):

2083-9.

- Nut def** Browning, J. D., Reeves, P. G., and O'Dell, B. L. effect of zinc deficiency and food restriction on the plasma levels of prostaglandin metabolites in male rats. *J. Nutr.* (1983) 113(4): 755-9.
- Nut def** Browning, Jimmy D. and O'Dell, Boyd L. low zinc status impairs calcium uptake by hippocampal synaptosomes stimulated by potassium but not by n-methyl-d-aspartate. *J. Nutr. Biochem.* (1995) 6(11): 588-94.
- Nut def** Browning, Jimmy D., Reeves, Philip G., and O'Dell, Boyd L. zinc deficiency in rats reduces the vasodilation response to bradykinin and prostacyclin. *J. Nutr.* (1987) 117(3): 490-5.
- No Dose** BROWNSCHIEDLE, C. M., WOOTTEN, V., MATHIEU, M. H., DAVIS, D. L., and HOFMANN, I. A. the effects of maternal diabetes on fetal maturation and neonatal health. *METAB CLIN EXP* 32:148-155,1983
- FL** Broz, J. and Sevcik, B. 1974. further results with nitrovin for fattening pigs. *Biologizace a Chemizace Vyzivy Zvirat* 10(2): 115-120.
- FL** Broz, J., Sevcik, B., and Tejnora, J. 1975. czechoslovak carbadox in the feed cos 2. *Biologizace a Chemizace Vyzivy Zvirat* 11(2): 131-137.
- Plant** Bruce, R. C. a review of the trace element nutrition of tropical pasture legumes in northern australia. *TROP GRASSL. Tropical Grasslands.* 12 (3). 1978 (Recd. 1979). 170-183.
- In Vit** BRUININK, A., FALLER, P., SIDLER, C., BOGUMIL, R., and VASAK, M. growth inhibitory factor and zinc affect neural cell cultures in a tissue specific manner. *CHEMICO-BIOLOGICAL INTERACTIONS*; 115 (3). 1998. 167-174.
- FL** Bruininx, E. M. A. M. and Peet-Schwering, C. M. C. van der. 1999. individual feed intake characteristics of weanling pigs housed ingroups. . <Document Title>Proefverslag - *Praktijkonderzoek Varkenshouderij* (P 1.233): 32 pp.
- Rev** Brummerstedt, E. lethal trait a-46 in cattle a review. *BRUMMERSTEDT, E. (ED.). PAPERS DEDICATED TO PROFESSOR JOHANNES MOUSTGAARD: ON THE OCCASION OF HIS SEVENTIETH BIRTHDAY THE 26TH OF SEPTEMBER 1981. VIII+245P. ROYAL DANISH AGRICULTURAL SOCIETY: COPENHAGEN, DENMARK. ILLUS. PAPER. ISBN 87-70262-20-9. 0 (0). 1981 (Recd. 1982). P240-245.*
- Nut def** Brummerstedt, E. lethal trait a-46 in cattle status and perspectives. *RYGAARD, J., ET AL. (ED.). IMMUNE-DEFICIENT ANIMALS IN BIOMEDICAL RESEARCH; 5TH INTERNATIONAL WORKSHOP, OCTOBER 13-16, 1985. XV+420P. S. KARGER AG: BASEL, SWITZERLAND; NEW YORK, NEW YORK, USA. ILLUS. ISBN 3-8055-4385-9. 0 (0). 1987. 47-50.*
- FL** Brummerstedt, E., Andresen, E., Basse, A., and Flagstad, T. 1974. lethal trait a 46 in cattle. immunological investigations. *Nordisk Veterinaermedicin* 26(No.5): 279-293.
- HHE** Brummerstedt, E., Basse, A., Flagstad, T., and Andresen, E. animal model of human disease acro dermatitis enteropathica zinc mal absorption. *AM J PATHOL. American Journal of Pathology.* 87 (3). 1977 725-728.
- Drug** Brummerstedt, E., Flagstad, T., Basse, A., and Andresen, E. 1971. the effect of zinc on calves with hereditary thymus hypoplasia. *Acta Pathologica Et Microbiologica Scandinavica* 79A(Fasc. 6): 686-687.

- Org Met** BRUMMETT, E. S. and MAYS, C. W. teratological studies of zn-dtpa in mice. *HEALTH PHYS* 33:624-626,1977
- FL** Brzozowska, A. and Pronczuk, A. 1985. relationship between magnesium and zinc levels of the diet and its protein utilization. *Annals Of Nutrition And Metabolism*. 29(4): 253-259.
- Nut** Brzozowska, A., Sicinska, A., Witkowska, J., and Roszkowski, W. effect of protein quality and dietary levels of iron zinc and copper on apparent absorption and tissue trace elements concentration in the rats. *SOUTHGATE, D. A. T., I. T. JOHNSON AND G. R. FENWICK (ED.). ROYAL SOCIETY OF CHEMISTRY AND SPECIAL PUBLICATIONS, NO. 72. NUTRIENT AVAILABILITY: CHEMICAL AND BIOLOGICAL ASPECTS; CONFERENCE, NORWICH, ENGLAND, UK, AUGUST 21-24, 1988. XIX+404P. ROYAL SOCIETY OF CHEMISTRY: CAMBRIDGE, ENGLAND, UK. ILLUS. ISBN 0-85186-856-8. 0 (0). 1989. 206-208.*
- Nut** Brzozowska, A., Sicinska, A., Witkowska, J., and Roszkowski, W. effect of protein quality and dietary levels of iron, zinc and copper on the apparent absorption and tissue concentration of trace elements in rats. *Spec. Publ. - R. Soc. Chem. (1989) 72(Nutr. Availability: Chem. Biol. Aspects): 206-8.*
- CP** Brzozowska, A. M. influence of magnesium and zinc in a diet on the nutritive value of casein in the rat. *Kiel. Milchwirtsch. Forschungsber. (1983) 35(3): 415-16 .*
- CP** Brzozowska, A. M. Warsaw Agricultural Univ. Poland Inst. of Human Nutrition. 1983. influence of magnesium and zinc in a diet on the nutritive value of casein in the rat. *Kieler Milchwirtschaftliche Forschungsberichte. V. 35(3) P. 415-416*
- Mix** Brzozowska, Anna, Czerwinska, Dorota, Kiepuski, Andrzej, Sicinska, Aleksandra, and Roszkowski, Wojciech. effect of protein quality and dietary level of iron, zinc and copper on the utilization of these elements by growing rats . ii. iron, zinc and copper content in tissues of experimental animals. *Acta Aliment. Pol. (1991) 17(2): 171-9 .*
- FL** Brzozowska, Anna, Popielarska, Danuta, Czerwinska, Dorota, Witkowska, Jolanta, Wronowski, Sylwester, and Roszkowski, Wojciech. effect of sodium salt of phytic acid on metabolism of iron, zinc, and copper in growing rats. *Bromatol. Chem. Toksykol. (1991) 24(3-4): 299-303.*
- FL** Brzozowska, Anna and Pronczuk, Andrzej. relationship between magnesium and zinc levels of the diet and its protein utilization. *Ann. Nutr. Metab. (1985) 29(4): 253-9.*
- Fate** Brzozowska, Anna, Witkowska, Jolanta, Wronowski, Sylwester, and Roszkowski, Wojciech. effect of protein quality and dietary level of iron, zinc and copper on the utilization of these elements by growing rats . part i. general development of animals and apparent absorption of iron, zinc and copper. *Acta Aliment. Pol. (1990) 16(1-2): 45-52.*
- FL** Brzozowska, Anna, Zielska, Grazyna, Morawiec, Marek, and Pronczuk, Andrzej. effect of mineral components on the utilization of dietary protein. part ii. zinc. *Zywienie Czlowieka Metab. (1985) 12(4): 227-35.*
- Org Met** Buckle, A. P., <Editors> Singleton, G. R., Hinds, L. A., Leirs, H., and Zhang ZhiBin. 1999. 7. rodenticides - their role in rodent pest management in tropicalagriculture. <Document Title>*Ecologically-Based Management of Rodent Pests*. 163-177.
- No COC** Budny, J. A., Niewenhuis, R. J., Buehler, E. V., and Goldenthal, E. I. 1973. subacute oral toxicity of trisodium nitrilotriacetate (na₃nta) in dogs. *Toxicology and Applied Pharmacology* 26(1): 148-53.

- No Oral** Budzynski, C. A., Strasser, R., and Bingman, V. P. 1998. the effects of zinc sulphate anosmia on homing pigeons, *Columba livia*, in a homing and a non-homing experiment. *Vol. 104, No. 2, Pp. 111-118* *Ethology*
- Bio Acc** Buegelsack G(A), Kolb, E., Salomon F-V, and Nestler, K. 1993. the content of Fe, Cu and Zn in female pigs in 11 age-groups beginning with the birth to a body mass of 200 to 265 kg. *DTW (Deutsche Tierärztliche Wochenschrift)* 100(9): 350-354.
- Abstract** Buell, S., Fosmire, G. J., and Sandstead, H. H. some effects of zinc deficiency on the development of the hippocampus and cerebellum in the suckling rat. *PROC N D ACAD SCI. Proceedings of the North Dakota Academy of Science.* 30 (1). 1976 5
- Nut def** Buell, S. J., Fosmire, G. J., Ollerich, D. A., and Sandstead, H. H. effects of post natal zinc deficiency on cerebellar and hippocampal development in the rat. *EXP NEUROL. Experimental Neurology.* 55 (1). 1977 199-210.
- Nut def** Buell, S J, Fosmire, G J, Ollerich, D A, and Sandstead, H H. effects of postnatal zinc deficiency on cerebellar and hippocampal development in the rat [reprinted from experimental neurology]. *US Agric Res Serv (Reprints Of Articles By Ars Employees)* 1977 55: 199-210. Ref.
- Nut def** Buell, S. J., Fosmire, G. J., and Sandstead, H. H. 1977. alterations in cerebellar and hippocampal development in weanling rat as consequences of postnatal zinc-deficiency.
- Nut def** Buell, Stephen J., Fosmire, Gary J., Ollerich, Dwayne A., and Sandstead, Harold H. effects of postnatal zinc deficiency on cerebellar and hippocampal development in the rat. *Exp. Neurol.* (1977) 55(1): 199-210 CODEN: EXNEAC.
- Unrel** Buenning, P., Holmquist, B., and Riordan, J. F. substrate specificity and kinetic characteristics of angiotensin converting enzyme EC-3.4.15.1. *Biochemistry.* 22 (1). 1983. 103-110.
- Abstract** Bui, L., Taubeneck, M., Faber, W., and Keen, C. multiple dosing of 2-ethylhexanoic acid alters maternal zinc (Zn) metabolism and is teratogenic in the rat. *FASEB J* 1997 Feb;11(3):A194
- CP** Bui, L. M., Dressendorfer, R. H., Keen, C. L., and Dubick, M. A. altered mineral metabolism in response to interleukin 1-beta IL-1-beta in rats fed a marginal zinc diet. 1992 *MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY (FASEB), PART I, ANAHEIM, CALIFORNIA, USA, APRIL 5-9, 1992. FASEB (FED AM SOC EXP BIOL) J.* 6 (4). 1992. A193.
- CP** Bui, L. M., Dressendorfer, R. H., Keen, C. L., Summary, J. J., and Dubick, M. A. 1994. zinc status and interleukin-1 beta-induced alterations in mineral metabolism in rats. *Proceedings Of The Society For Experimental Biology And Medicine.* 206(4): 438-444.
- Abstract** Bui, L. M., Taubeneck, M. W., Faber, W. D., and Keen, C. L. altered zinc (Zn) metabolism contributes to the developmental toxicity of 2-ethylhexanoic acid (EHXA) in Sprague-Dawley rats. *Teratology* 1997 Jan;55(1):60
- Bact** Bukhari, Z. and Smith, H. V(A). 1995. effect of three concentration techniques on viability of *Cryptosporidium parvum* oocysts recovered from bovine feces. *Journal of Clinical Microbiology* 33(10): 2592-2595.
- Org Met** Bullard, R. W. and Shumake, S. A. food base flavor additive improves bait acceptance by ricefield rats. *Journal of Wildlife Management.* 41 (2). 1977 290-297.
- CP** Bunce, G. E., Dylewski, D., and Lytton, F. D. C. 1985. diminished uterine gap junction

formation in zinc-deficient pregnant rats at term. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th* : Meeting Date 1984, 201-5. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK..

- Abstract** Bunce, G. E. and Gordon, E. A. use of ovarian 20-alpha hydroxy steroid dehydrogenase activity as a marker for the onset of parturition in rats. *61ST ANNUAL MEETING OF THE VIRGINIA ACADEMY OF SCIENCE, FAIRFAX, VA., USA, MAY 17-20, 1983. VA J SCI.* 34 (3). 1983. 100.
- CP** Bunce, G. E., Hess, J. L., Veit, H., Hill, J. L., and McClellan, M. 1978. nephrosis in female rats fed a low zinc diet during gestation. *Federation Proceedings* 37(3): 668.
- CP** Bunce, G. E., Lytton, F., Guneseckera, B., Vessal, M., and Kim, C. 1994. molecular basis for abnormal parturition in zinc deficiency in rats. *Advances In Experimental Medicine And Biology.* 352 : 209-214.
- CP** Bunce, G. E., Stewart, K. K., and Kim, C. vitellogenin induction in quail is diminished by a marginal zinc diet. *75TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ATLANTA, GEORGIA, USA, APRIL 21-25, 1991. FASEB (FED AM SOC EXP BIOL) J.* 5 (5). 1991. A941.
- Nut def** Bunce, G. E., Wilson, G. R., Mills, C. F., and Klopfer, A. 1983. studies on the role of zinc in parturition in the rat. *Biochem. J.* 210(3): 761-7 .
- Org Met** Bundock Elisabeth A, Drummond George S, and Kappas Attallah(A). 1996. tissue distribution of synthetic heme analogues: studies with tin, chromium, and zinc mesoporphyrins. *Pharmacology (Basel)* 52(3): 187-198.
- Diss** Bundscherer, B. 1984.*Cadmium Retention in Liver and Kidneys of Growing Chicks As Influenced by Zinc Intake and Different Binding-Forms of Cadmium.* <NOTE> Diss. (Dr.Med.Vet.). GSF-B-1689
- FL** Bundscherer, B., Rambeck, W. A., Kollmer, W. E., and Zucker, H. effect of dietary zink level on cadmium retention in the liver and kidney of chicks. *Z. Ernaehrungswiss.* (1985) 24(2): 73-8.
- FL** Bundscherer, B. Muenchen Univ. Germany F. R. Tieraerztliche Fakultaet. Inst. fuer Physiologie Physiologische Chemie und Ernaehrungsphysiologie, Rambeck, W. A., Kollmer, W. E., and Zucker, H. 1985. [influence of dietary zinc on cadmium retention in the liver and kidney of growing chicks]. <original> einfluss des zinkgehalts im futter auf die cadmiumretention in leber und nieren beim huehnerkueken. *Zeitschrift Fuer Ernaehrungswissenschaft.* V. 24(2) P. 73-78
- Abstract** Bunk, M. J., Dnistrian, A., Schwartz, M. K., and Rivlin, R. S. dietary zinc deficiency impairs plasma transport of vitamin e. *TWENTY-SEVENTH ANNUAL MEETING OF THE AMERICAN SOCIETY FOR CLINICAL NUTRITION, SAN DIEGO, CALIFORNIA, USA, APRIL 30-MAY 2, 1987. AM J CLIN NUTR.* 45 (4). 1987. 865.
- Nut def** Bunk, M. J., Dnistrian, A. M., Schwartz, M. K., and Rivlin, R. S. dietary zinc deficiency decreases plasma concentrations of vitamin e. *Proc. Soc. Exp. Biol. Med.* (1989) 190(4): 379-84.
- CP** Bunk, M. J., Dnistrian, A. M., Seres, D. S., Schwartz, M. K., and Rivlin, R. S. regulation of plasma concentrations of vitamin e by marginal intake of dietary zinc. *EIGHTIETH ANNUAL NATIONAL MEETING OF THE AMERICAN SOCIETY FOR CLINICAL INVESTIGATION, WASHINGTON, D.C., USA, APRIL 29-MAY 2, 1988. CLIN RES.* 36 (3). 1988. 548a.
- IMM** Bunk, M. J., Galvin, J. E., Yung, Y. P., Dnistrian, A. M., and Blaner, W. S. 1987. relationship of

cytotoxic activity of natural killer cells to growth rates and serum zinc levels of female riii mice fed zinc. *Nutrition and Cancer* 10(1-2): 79-87.

- Abstract** Bunk, M. J., Yung, Y. P., Galvin, J. E., and Blaner, W. S. divergent zinc needs for growth and for natural killer cell activity in weaning mice evidence for a hierarchy of zinc requirements. *TWENTY-SEVENTH ANNUAL MEETING OF THE AMERICAN SOCIETY FOR CLINICAL NUTRITION, SAN DIEGO, CALIFORNIA, USA, APRIL 30-MAY 2, 1987. AM J CLIN NUTR.* 45 (4). 1987. 845.
- In Vit** Bunk, M. J., Yung, Y. P., Galvin, J. E., and Blaner, W. S. 1987. divergent zinc needs for growth and for natural-killer cell-activity in weanling mice - evidence for a hierarchy of zinc requirements. *Clinical Research* 35: A768.
- Alt** Bunk, Michael J., Galvin, James E., Yung, Yee-Pang, Dnistrian, Ann M., and Blaner, William S. 1987. relationship of cytotoxic activity of natural killer cells to growth rates and serum zinc levels of female riii mice fed zinc. *Nutr. Cancer* 10(1-2): 79-87.
- No COC** Bunke, M. and Itskovitz, H. 1986. urinary excretion and renal production of prostaglandins e2, f2 alpha, and thromboxane b2 in experimental diabetes mellitus. *Journal of Laboratory and Clinical Medicine* 108(4): 332-9.
- No COC** Bunke, M. and Itskovitz, H. urinary excretion and renal production prostaglandins e-2 f-2-alpha and thromboxane b-2 in experimental diabetes mellitus. *J LAB CLIN MED. Journal of Laboratory and Clinical Medicine.* 108 (4). 1986. 332-339.
- In Vit** Bunning, P., Holmquist, B., and Riordan, J. F. 1983. substrate specificity and kinetic characteristics of angiotensin converting enzyme. *Biochemistry* 22(1): 103-10.
- No Dose** Buntain, B. J. and Selman, I. E. 1980. controlled studies of various treatments for neonatal calf diarrhoea incalves of known immunoglobulin levels. *Veterinary Record* 107(11): 245-248.
- FL** Buntak-Kobler, D. and Stipetic, S. 1981. [the histological analysis of the consequences of root-canal traumatic perforation (author's transl)]. <original> histolosko provjeravanje posljedica traumatske perforacije korijenskog kanala. *Acta Stomatologica Croatica* 15(3): 109-14.
- No COC** Bunyan, J., Jeffries, L., Sayers, J. R., Gulliver, A. L., and Coleman, K. anti microbial substances and chick growth promotion the growth promoting activities of anti microbial substances including 52 used either in therapy or as dietary additives. *BR POULT SCI. British Poultry Science.* 18 (3). 1977 283-294.
- No COC** Bunyan, J., Jeffries, L., Sayers, J. R., Gulliver, A. L., and Coleman, K. 1977. antimicrobial substances and chick growth promotion: the growth-promoting activities of antimicrobial substances, including fifty-two used either in therapy or as dietary additives. *British Poultry Science* 18(3): 283-294.
- Abstract** Burch, R. E., Williams, R. V., and Sullivan, J. F. effect of selenium and cobalt on tissue trace metals. *FED PROC. Federation Proceedings.* 32 (3 Part 1). 1973 886
- No Tox** Burch, Robert E., Sullivan, James F., Jetton, Mary M., and Hahn, Henry K. J. 1979. the effect of aging on trace element content of various rat tissues: i. early stages of aging. *Age (Omaha Nebr.)* 2(4): 103-7.
- Alt** Burch, W. M., Hamner, G., and Wuthier, R. E. phosphotyrosine and phosphoprotein phosphatase activity of alkaline phosphatase in mineralizing cartilage. *METAB CLIN EXP. Metabolism Clinical and Experimental.* 34 (2). 1985. 169-175.

- No Oral** Burd, Gail D. morphological study of the effects of intranasal zinc sulfate irrigation on the mouse olfactory epithelium and olfactory bulb. *Microsc. Res. Tech.* (1993) 24(3): 195-213.
- Nut def** Burger, I., Edney, A., and Horrocks, D. 1987. basics of feline nutrition. *In Practice* 9(4): 143...150.
- Nut def** Burger, R. A., Atuahene, Y. O., and Arscott, G. H. 1984. effect of several dermatitis preventing agents on foot pad dermatitis in dwarf and normal sized single comb white leghorn layers (dietary zinc deficiency, chickens). *Poultry Science.* 63 (5): 997-1002.
- No Oral** Buritova, J., Honore, P., and Besson, J. M. 1995. indomethacin reduces both krox-24 expression in the rat lumbar spinal cord and inflammatory signs following intraplantar carrageenan. *Brain Research* 674(2): 211-20.
- Unrel** Burke, J. P., Boyd, R. B., Fenton, M. R., Thompson, V. W., Stock, D., and Atkin, J. zinc deprivation and its relationship to peripheral nerve structure and function in sprague-dawley rats. *J. Trace Elem. Exp. Med.* (1995) 8(3): 155-60.
- Abstract** Burke, J. P. and Fenton, M. R. the effect of a zinc deficient diet on liver plasma membrane structure and membrane associated enzyme activity. 69TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ANAHEIM, CALIF., USA, APR. 21-26, 1985. *FED PROC.* 44 (5). 1985. 1508.
- Abstract** Burke, J. P. and Fenton, M. R. the effect of a zinc deficient diet on membrane turnover and protein secretion in tpc-183 plasma cytoma cells. 66TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, NEW ORLEANS, LA., USA, APRIL 15-23, 1982. *FED PROC.* 41 (3). 1982. Abstract 2988.
- Abstract** Burke, J. P. and Fenton, M. R. the effect of a zinc deficient diet on mitochondrial function in an immuno globulin m secreting plasma cytoma. 67TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, CHICAGO, ILL., USA, APRIL 10-15, 1983. *FED PROC.* 42 (4). 1983. Abstract 3097.
- Abstract** Burke, J. P. and Fenton, M. R. effect of a zinc deficient diet on phospho lipid levels and cholesterol in liver sub cellular membranes. 68TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 1-6, 1984 *FED PROC.* 43 (3). 1984. Abstract 2345.
- CP** Burke, J. P. and Fenton, M. R. peripheral nerve metabolism and zinc levels in streptozotocin induced diabetic rats effect of diets high in fish and corn oil. 75TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ATLANTA, GEORGIA, USA, APRIL 21-25, 1991. *FASEB (FED AM SOC EXP BIOL) J.* 5 (5). 1991. A941.
- Alt** Burke, J. P. and Fenton, M. R. 1989. plasma and cellular zinc levels and membrane lipid composition in streptozotocin diabetic rats. *Comparative Biochemistry And Physiology : B : Comparative Biochemistry.* 93(2): 409-412.
- Alt** Burke, J. P., Fenton, M. R., Corrigan, G., and Joseph, R. 1988. liver membrane zinc and lipid-composition in the db/db mouse. *Nutrition Reports International* 38(1): 69-77.
- Nut def** Burke, J. P., Fenton, M. R., Miller, M. L., and Tursi, F. D. 1981. the effect of a zinc-deficient diet and the inflammatory response on rat liver mitochondrial protein synthesis. *Biochemical Medicine* 25(1): 48-55.
- CP** Burke, J. P., Stock, D., and Fenton, M. R. the development of peripheral neuropathy in rats on a

zinc deficient diet. 1992 MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY (FASEB), PART I, ANAHEIM, CALIFORNIA, USA, APRIL 5-9, 1992. FASEB (FED AM SOC EXP BIOL) J. 6 (4). 1992. A1093.

- Nut def** Burke, James P., Owens, Kenneth, and Fenton, Marilyn R. effect of a zinc-deficient diet on mitochondrial and microsomal lipid composition in tepc-183 plasmacytoma. *Biochem. Med. Metab. Biol.* (1987) 37(2): 148-56.
- FL** Burkhanov, A. I. 1988. [evaluation of the toxicity of the dust from a lead-zinc concentrate]. <original> otsenka toksichnosti pyli svintsovo-tsinkovogo kontsentrata. *Gigiena Truda i Professional'Nye Zabolevaniia* (3): 32-5.
- No COC** Burnett, G. S. and Neil, E. L. a note on the effect of probioticum feed additive on the liver weight gain feed conversion and carcass quality of bacon pigs. *ANIM PROD. Animal Production.* 25 (1). 1977 95-98.
- Unrel** Burns, Margaret S., Bellhorn, Roy W., Impellizzeri, Charles W., Aguirre, Gustavo D., and Laties, Alan M. development of hereditary tapetal degeneration in the beagle dog. *Curr. Eye Res.* (1988) 7(2): 103-14 .
- IMM** Burns, R. B. 1983. antibody production suppressed in the domestic fowl (gallus domesticus) by zinc deficiency. *Avian Pathology* 12(1): 141-146.
- Nut def** Burns, W. A., Khedekar, R. R., and Smith, J. C. Jr. ultrastructural changes in the testis of zinc deficient rats. *FED PROC. Federation Proceedings.* 38 (3 Part 1). 1979 605
- FL** Burpo, C. E., Savage, J. E., and O'Dell, B. L. 1971. biological availability of zinc in foodstuffs. <Document Title>Trace Substances in Environmental Health. IV. 260-265.
- Nut def** Bus, J. S. 1985. the relationship of carbon disulfide metabolism to development of toxicity. *Neurotoxicology* 6(4): 73-80.
- HHE** Busch, S. J., Barnhart, R. L., Martin, G. A., Fitzgerald, M. C., Yates, M. T., Mao, S. J., Thomas, C. E., and Jackson, R. L. 1994. human hepatic triglyceride lipase expression reduces high density lipoprotein and aortic cholesterol in cholesterol-fed transgenic mice. *Journal of Biological Chemistry* 269(23): 16376-82.
- Phys** Bush, A. I., Pettingell, W. H. JR, de Paradis, M., Tanzi, R. E., and Wasco, W. 1994. the amyloid beta-protein precursor and its mammalian homologues. evidence for a zinc-modulated heparin-binding superfamily. *Journal of Biological Chemistry* 269(43): 26618-21 .
- Bact** Bush, K., Henry, P. R., and Slusarchyk, D. S. 1984. muraceins--muramyl peptides produced by nocardia orientalis as angiotensin-converting enzyme inhibitors. i. taxonomy, fermentation and biological properties. *Journal of Antibiotics* 37(4): 330-5.
- Bio Acc** Bush, R. S. and Nicholson, J. W. G. 1985. the effect of cement kiln dust on tissue accumulation of trace minerals in steers. *Canadian Journal of Animal Science* 65(2): 429-435.
- Nut def** Bushnell, Philip J. and Levin, Edward D. effects of zinc deficiency on lead toxicity in rats. *Neurobehav. Toxicol. Teratol.* (1983) 5(3): 283-8.
- HHE** Bustin, S. A., Nie, X. F., Barnard, R. C., Kumar, V., Pascall, J. C., Brown, K. D., Leigh, I. M., Williams, N. S., and McKay, I. A. 1994. cloning and characterization of erf-1, a human member of the tis11 family of early-response genes. *DNA and Cell Biology* 13(5): 449-59.

- Unrel** Butcher, E. O. and Mitchell, O. G. 1967. structure and secretory mechanism of rodent and primate palatine glands. *Journal of Dental Research* 46(4): 672-4.
- Surv** Butler, D. L., Krueger, R. P., Osmundson, B. C., and Thompson, A. J. 1993. *Reconnaissance Investigation of Water Quality, Bottom Sediment, and Biota Associated With Irrigation Drainage in the Pine River Project Area, Southern Ute Indian Reservation, Southwestern Colorado and Northwestern New Mexico, 1988-89* : 105 pp.
- Nut** Butler, K. D. Jr and Hintz, H. F. effect of level of feed intake and gelatin supplementation on growth and quality of hoofs of ponies. *Journal of Animal Science*. 44 (2). 1977 257-261.
- In Vit** Butler, P. E., McKay, M. J., and Bond, J. S. 1987. characterization of meprin, a membrane-bound metalloendopeptidase from mouse kidney. *Biochemical Journal* 241(1): 229-35 .
- Rev** Butterworth, C. E. Jr and Tamura, T. 1989. folic acid safety and toxicity: a brief review. *American Journal of Clinical Nutrition* 50(2): 353-8.
- Nut def** Buttolph, M. L., Misa, T., and Newberne, P. M. 1981. effects of caramel diets and other dietary manipulations on cecal enlargement, kidney pathology and hematology. *Nutrition Reports International* 23(6): 1043-1054.
- Unrel** Buxton, L. E. and Murdoch, R. N. behavior and properties of membrane bound mouse uterine alkaline phosphatase ec-3.1.3.1 during early pregnancy. *AUST J BIOL SCI. Australian Journal of Biological Sciences*. 33 (5). 1980. 539-548.
- Gene** Buxton Paul G, Kostakopoulou Konstadina, Brickell Paul, Thorogood Peter, and Ferretti Patrizia(A). 1997. expression of the transcription factor slug correlates with growth of the limb bud and is regulated by fgf-4 and retinoic acid. *International Journal of Developmental Biology* 41(4): 559-568.
- Bact** Bwangamoi, O., Mavenyengwa, M., Mohan, K., and Ngondonga, J. 1993. an outbreak of exudative epidermitis in bacon pigs in zimbabwe. *Zimbabwe Veterinary Journal* 24(4): 149-158.
- No Oral** Byar, D. P., Anderson, J. E., and Mostofi, F. K. 1968. *The Distribution of 65ZINC IN THE Prostate and Other Organs in Control, Castrated, and Hypophysectomized Rats* : 9p.
- FL** Byazzubau, V. I. 1974. relation of amount of zinc in the diet to some indices of carbohydratemetabolism in pigs. *Vestsi Akademii Navuk BSSR, Sel'Skagaspadarchykh Navuk* (3): 112-117, 144.
- Org Met** Byers, R. E. and Carbaugh, D. H. 1987. bait shyness of pine voles to zinc phosphide and anticoagulants stored with pesticides. *Hortscience*. 22(2): 239-241.
- No COC** Byers, R. E. and Carbaugh D. H. 1987. bait shyness of pine voles to zinc phosphide and anticoagulants stored with pesticides. *Hortscience*. 22(2): 239-241.
- No COC** Byers, R. E. and Carbaugh D. H. 1991. rodenticides for the control of pine and meadow voles in orchards. *J. Environ. Hortic.* 9(3): 167-172.
- No COC** Byers, R. E. and Carbaugh D. H. 1989. vole population shifts related to rodenticide usage. *Hortscience*. 24(5): 783-785.
- Org Met** Byers, Ross E. and Carbaugh, David H. rodenticides for the control of pine and meadow voles in orchards. *J. Environ. Hortic.* (1991) 9(3): 167-72.

- Alt** Byington, Neal Dwain. 1982. flow injection atomic absorption assay of copper and zinc in the plasma of age dependent audiogenic seizure susceptible mice. Avail.: Univ. Microfilms Int. Order No. DA8305418 From: Diss. Abstr. Int. B 1983, 43. 10. 3228. Unavailable. 220 pp.
- Drug** Caballeria, Joan, Gimenez, America, Andreu, Hernan, Deulofeu, Ramon, Pares, Albert, Caballeria, Llorenc, Ballesta, Antonio M., and Rodes, Joan. zinc administration improves gastric alcohol dehydrogenase activity and first-pass metabolism of ethanol in alcohol-fed rats. *Alcohol.: Clin. Exp. Res.* (1997) 21(9): 1619-1622.
- In Vit** Cable Edward E, Gildemeister Otto S, Pepe Joyce A, Donohue Susan E, Lambrecht Richard W, and Bonkovsky Herbert L(A). 1996. hepatic 5-aminolevulinic acid synthase mrna stability is modulated by inhibitors of heme biosynthesis and by metalloporphyrins. *European Journal of Biochemistry* 240(1): 112-117.
- In Vit** Cable Edward E, Pepe Joyce A, Karamitsios Nicholas C, Lambrecht Richardw. , and Bonkovsky Herbert L(A). 1994. differential effects of metalloporphyrins on messenger rna levels of delta-aminolevulinate synthase and heme oxygenase: studies in cultured chick embryo liver cells. *Journal of Clinical Investigation* 94(2): 649-654.
- No COC** Cabre, Maria, Ferre, Natalia, Folch, Jaume, Paternain, Jose L., Hernandez, Merce, Del Castillo, Daniel, Joven, Jorge, and Camps, Jordi. inhibition of hepatic cell nuclear dna fragmentation by zinc in carbon tetrachloride-treated rats. *J. Hepatol.* (1999) 31(2): 228-234 .
- Nut def** Cabre, Maria, Folch, Jaume, Gimenez, America, Matas, Carme, Pares, Albert, Caballeria, Joan, Paternain, Jose Luis, Rodes, Joan, Joven, Jorge, and Camps, Jordi. influence of zinc intake on hepatic lipid peroxidation and metallothioneins in alcoholic rats : relationship of collagen synthesis. *Int. J. Vitam. Nutr. Res.* (1995) 65(1): 45-50.
- Acu** Cacheris, W. P., Quay, S. C., and Rocklage, S. M. the relationship between thermodynamics and the toxicity of gadolinium complexes. *Magnetic Resonance Imaging.* 8 (4). 1990. 467-482.
- Abstract** Caddell, J. L. increased dietary zinc and the outcome of pregnancy in magnesium deficient rat dams. *ANNUAL MEETING OF THE AMERICAN PEDIATRIC SOCIETY AND THE SOCIETY FOR PEDIATRIC RESEARCH, SAN FRANCISCO, CALIF., USA, APRIL 28-MAY 1, 1981. PEDIATR RES.* 15 (4 Part 2). 1981. 528.
- Nut def** Caddell, J. L. 1981. increased dietary zinc and the outcome of pregnancy in magnesium (mg) deficient rat dams. *Pediatric Research* 15: 528.
- Drug** Cadet, J. L., Ali, S. F., Rothman, R. B., and Epstein, C. J. 1995. neurotoxicity, drugs and abuse, and the cuzn-superoxide dismutase transgenic mice. *Molecular Neurobiology* 11(1-3): 155-63.
- Alt** Cadet, J. L., Ladenheim, B., Baum, I., Carlson, E., and Epstein, C. 1994. cuzn-superoxide dismutase (cuznsod) transgenic mice show resistance to the lethal effects of methylenedioxyamphetamine (mda) and of methylenedioxymethamphetamine (mdma). Vol. 655, No. 1-2, Pp. 259-262 *Brain Res.*
- Bio Acc** Cahill, T. M., Anderson, D. W., Elbert, R. A., Perley, B. P., and Johnson, D. R. 1998. elemental profiles in feather samples from a mercury-contaminated lake in central california. *Arch. Environ. Contam. Toxicol.* 35(1): 75-81 .
- FL** Cai, D., Wang, D., Xu, Q., and Li, R. effects of dietary zinc on experimental burns in rabbits. *ACTA NUTR SIN.* 11 (1). 1989. 54-59.
- Alt** Cai, Donglian, Wang, Dekai, Li, Rongjie, and Xu, Qinghua. effects of zinc on burn healing and

correlation between serum zinc and serum protein and alkaline phosphatase in burned rabbits. *J. Med. Coll. PLA (1988)* 3(2): 185-90.

- Mix** Cai, Xuelin, Song, Xuehua, and Wu, Suqiong. studies on relationship between trace element accumulation in hair and metabolism in the body of rabbit by using ⁷⁵se and ⁶⁵zn tracer technique. *Henong Xuebao (1999)* 13(3): 168-174.
- Nut def** Cakmak, I. and Marschner, H. 1988. enhanced superoxide radical production in roots of zinc-deficient plants. *Journal Of Experimental Botany* 39(207): 1449-1460.
- Nut def** Cakmak, I. and Marschner, H. 1988. increase in membrane-permeability and exudation in roots of zinc-deficient plants. *Journal Of Plant Physiology* 132(3): 356-361.
- Nut def** Cakmak, I. and Marschner, H. 1987. mechanism of phosphorus-induced zinc-deficiency in cotton .3. changes in physiological availability of zinc in plants. *Physiologia Plantarum* 70(1): 13-20.
- Plant** Cakmak, I. and Marschner, H. 1988. zinc-dependent changes in electron-spin-resonance signals, nadph oxidase and plasma-membrane permeability in cotton roots. *Physiologia Plantarum* 73(1): 182-186.
- FL** Calamari, L., Bertoni, G., Maianti, M. G., and Cappa, V. 1989. usefulness of new haematochemical indices in the assessment of metabolic profile in dairy cows. *Zootecnica e Nutrizione Animale* 15(3): 191-210.
- CP** Calamari, L., Maianti, M. G., Carasi, C., Bertoni, G., and <Editors> Trenti, F. 1994. the acute phase state and the metabolic and functional liver changes. <document title>proceedings 18th world buiatrics congress: 26th congress of the italian association of buiatrics, bologna, italy, august 29-september 2, 1994. volume 2. 1215-1218.
- FL** Calandriello, M. 1971. [experimental study on the histological tolerance of various surgical cements of common use in periodontal surgery]. <original> ricerche sperimentali sulla tolleranza istologica di diversi cementi chirurgici di comune impiego in chirurgia parodontale. *Rivista Italiana Di Stomatologia* 26(7): 514-34.
- CP** Calboun, N. R., Howard, M. P., Brown, E. D., and Smith, J. C. 1983. the effect of zinc deficiency on bones labeled with super(65)zinc. fifth annual scientific meeting of the american society for bone and mineral research. abstracts. P. 638. Vol. 35, No. 4-5 Calcif. Tissue Int.
- Phys** Calcagnetti, D. J., Quatrella, L. A., and Schechter, M. D. 1996. olfactory bulbectomy disrupts the expression of cocaine-induced conditioned place preference. *Physiology & Behavior* 59(4-5): 597-604.
- No Dose** Caldas, A., Richard, M. J., Maniar, S., Laouari, D., Dechaux, M., Favier, A., and Kleinknecht, C. zinc bone loss in chronic renal failure and chronic metabolic acidosis. *Biological Trace Element Research*. Jan/Mar 1992. v. 32 p. 339-348.
- Alt** Caldas, Alberto, Richard, Marie Jeanne, Maniar, Saad, Laouari, Denise, Dechaux, Michele, Favier, Alain, and Kleinknecht, Claire. zinc bone loss in chronic renal failure and chronic metabolic acidosis. *Biol. Trace Elem. Res. (1992)* : 32, 339-48 .
- No Dose** CALDER, S. E., MAYS, C. W., TAYLOR, G. N., and BRAMMER, T. zn-dtpa safety in the mouse fetus. *HEALTH PHYS* 36:524-526,1979
- FL** Calderon, A. M., Hornedo, A. S., Lopez Morales J R, and Navarro Fierro R. pathological study and economical analysis of zinc deficiencies in pigs. *VETERINARIA (MEX CITY)*.

VETERINARIA (Mexico City). 20 (1). 1989. 39-46.

- Unrel** Caldwell, G. L., White, D. G., Kelsey, M., Peters, A. R., and Solly, K. J. 1988 . relationship of calf antibody status to disease and performance. *Veterinary Record* 122(3): 63-65.
- No Control** Caldwell, D. F. and Oberleas, D. effects of protein and zinc nutrition on behavior in the rat . *PAN AMER HEALTH ORGAN SCI PUBL.* 185. 1969 2-8
- Nut def** Caldwell, D. F., Oberleas, D., and Prasad, A. S. reproductive performance of chronic mildly zinc-deficient rats and the effects on behavior of their offspring. *Nutr. Rep. Int.* (1973) 7(5): 309-19
- Nut def** Caldwell, D. F., Oberleas, Donald, and Prasad, Ananda S. psychobiological changes in zinc deficiency. *Trace Elem. Hum. Health Dis.* (1976) Volume 1, 311-25. Editor: Volume 1, 311-25. Editor(s): Prasad, Ananda S.; Oberleas, Donald. Publisher: Academic, New York, N. Y..
- Nut def** Caldwell, Donald F., Oberleas, D., Clancy, J. J., and Prasad, A. S. behavioral impairment in adult rats following acute zinc deficiency. *Proc. Soc. Exp. Biol. Med.* (1970) 133(4): 1417-21
- Abstract** Calhoun, N. R., Becker, K. L., and Smith, J. C. Jr. the essentiality of zinc for bone formation. *Federation Proceedings.* 32 (3 Part 1). 1973 896
- Nut def** Calhoun, N R, McDaniel, E G, Howard, M P, and Smith, J C Jr. loss of zinc from bone during [dietary] deficiency state [rats]. *Nutr Rep Int* Mar 1978 17 (3): 299-306.
- Nut def** Calhoun, N. R., McDaniel, E. G., Howard, M. P., and Smith, J. C. Jr. CS Hospital Washington D. C. 20422 USA. 1978. loss of zinc from bone during deficiency state. *Nutrition Reports International* 17(3): 299-306.
- Nut def** Calhoun, N. R., Smith, J. C. Jr, and Becker, K. L. 1975. the effects of zinc on ectopic bone formation. *Oral Surgery, Oral Medicine, and Oral Pathology* 39(5): 698-706.
- Nut def** Calhoun, Noah R., McDaniel, E. G., Howard, Mary Patricia, and Smith, J. Cecil Jr. loss of zinc from bone during deficiency state. *Nutr. Rep. Int.* (1978) 17(3): 299-306.
- FL** Calizaya Cuadros, C. A. 1992. [effect of the growth promoter rotation in swine feeding in the initiation and growth phases]. <original> efecto de la rotacion de promotores de crecimiento en la alimentacion de cerdos en las fases de inicio y crecimiento. 92 P.
- No Oral** Calvin, H. I. comparative labeling of rat epididymal spermatozoa by intratesticularly administered $^{65}\text{ZnCl}_2$ and $[^{35}\text{S}]\text{cysteine}$. *J. Reprod. Fertil.* (1981) 61(1): 65-73.
- No Oral** Calvin, H. I. selective incorporation of selenium-75 into a poly peptide of the rat sperm tail. *Journal of Experimental Zoology.* 204 (3). 1978 445-452.
- Drug** Camargo, W. V. de A., Fernandes, N. S., and Santiago, A. M. H. 1981. periodontal disease in cattle in brazil. *Biologico* 47(6): 183-185.
- In Vit** Cameselle, J. C., Costas, M. J., Sillero, M. A., and Sillero, A. 1983. dinucleosidetetraphosphatase inhibition by $\text{Zn}(\text{II})$. *Biochemical and Biophysical Research Communications* 113(2): 717-22.
- In Vit** Cameselle, J. C., Costas, M. J., Sillero, M. A. G., and Sillero, A. di nucleoside tetra phosphatase ec-3.6.1.17 inhibition by zinc ii. *Biochemical and Biophysical Research Communications.* 113 (2). 1983. 717-722.

- Nut def** Campbell, J. K. and Mills, C. F. 1979. *the toxicity of zinc to pregnant sheep. Environ Res.* 20(1): 1-13.
- No Dose** Campbell-Beggs, C. L., Johnson, P. J., Messer, N. T., Lattimer, J. C., Johnson, G., and Casteel, S. W. 1994. osteochondritis dissecans in an appaloosa foal associated with zinc toxicosis. *Journal of Equine Veterinary Science* 14(10): 546-550.
- CP** Campbell, J. K., Davies, N. T., and Mills, C. F. 1978. interactions of cadmium, copper and zinc in animals chronically exposed to low levels of dietary cadmium. *Trace Elem. Metab. Man Anim. Proc. Int. Symp., 3rd* : Meeting Date 1977, 553-6. Editor(s): Kirchgessner, M. Publisher: Arbeitskreis Tierernaehrungsforschung Weihenstephan Inst. Ernaehrungsphysiol., Freising-Weihenstephan, Ger..
- Drug** Campbell, M. H. and Miller, J. K. 1998. effect of supplemental dietary vitamin e and zinc on reproductive performance of dairy cows and heifers fed excess iron. *Journal of Dairy Science* 81(10): 2693-2699.
- Nut def** Campbellbrown, M., Ward, R. J., Haines, A. P., North, W. R. S., Abraham, R., Mcfadyen, I. R., Turnlund, J. R., and King, J. C. 1985. zinc and copper in asian pregnancies - is there evidence for a nutritional deficiency. *British Journal Of Obstetrics And Gynaecology* 92(9): 875-885.
- In Vit** Campo, R. D. 1988. effects of cations on cartilage structure swelling of growth plate and degradation of proteoglycans induced by chelators of divalent cations. *Calcified Tissue International.* 43(2): 108-121.
- Nut def** Campos, M. S., Gomez-Ayala, A. E., Lopez-Aliaga, I., Pallares, I., Hartiti, S., Pharm, B., Alterez, M. J. M., Barrionuevo, M., Rodriguez-Matas, M. C., and Lisbona, F. role of the proximal colon in mineral absorption in rats with and without ferropenic anemia. *Nutr. Res. (N. Y.)* (1996) 16(9): 1529-1543
- FL** Camps, D. M. 1996. growth promoters in broiler chickens. *Revista Cubana De Ciencia Avicola* 20(1): 31-37.
- FL** Camps, J., Cabre, M., Gimenez, A., Caballeria, J., Pares, A., Joven, J., and Rodes, J. influence of dietary zinc on hepatic lipid peroxidation and proline hydroxylase activity in alcoholic rats. *27th Annual Meeting Of The European Association For The Study Of The Liver, Vienna, Austria, August 26-29, 1992. J HEPATOL (AMST).* 16 (Suppl. 1). 1992. S83.
- No COC** Camps, Jordi, Bargallo, Teresa, Gimenez, America, Alie, Silvia, Caballeria, Joan, Pares, Albert, Joven, Jorge, Masana, Lluís, and Rodes, Joan. relationship between hepatic lipid peroxidation and fibrogenesis in carbon tetrachloride-treated rats : effect of zinc administration. *Clin. Sci.* (1992) 83(6): 695-700 .
- Nut** Canfield, W. K. and Johnson, W. T. 1987. the influence of the dietary ratio of polyunsaturated to saturated fatty acids on zinc metabolism. *Nutrition Research.* 7(1): 109-119.
- Nut** Canfield, Wesley K. and Johnson, W. Thomas. the influence of the dietary ratio of polyunsaturated to saturated fatty acids on zinc metabolism. *Nutr. Res. (N. Y.)* (1987) 7(1): 109-19 .
- Nut def** Cannon, Dale S., Crawford, Isaac L., and Carrell, Laura E. zinc deficiency conditions food aversions in rats. *Physiol. Behav.* (1988) 42(3): 245-7.
- Abstract** Canolty, N. L. and Johnson, M. A. effects of increasing dietary lithium carbonate on weight and mineral contents of tissues from weanling rats. *71st Annual Meeting Of The Federation Of*

American Societies For Experimental Biology, Washington, D.C., Usa, March 29-April 2, 1987. Fed Proc. 46 (3). 1987. 906.

- Nut def** Canton, Mary C., Cotter, B. M., Cremin, F. M., and Morrissey, P. A. the effect of dietary zinc deficiency on pancreatic .gamma.-glutamyl hydrolase (ec 3.4.22.12) activity and on the absorption of pteroylpolyglutamate in rats. *Br. J. Nutr. (1989) 62(1): 185-93.*
- Nut def** Canton, Mary C. and Cremin, F. M. the effect of dietary zinc depletion and repletion on rats : zn concentration in various tissues and activity of pancreatic .gamma.-glutamyl hydrolase (ec 3.4.22.12) as indices of zn status. *Br. J. Nutr. (1990) 64(1): 201-9.*
- In Vit** Canton, T., Pratt, J., Stutzmann, J. M., Imperato, A., and Boireau, A. 1998. glutamate uptake is decreased tardively in the spinal cord of fals mice. *Vol. 9, No. 5, Pp. 775-778 Neuroreport*
- CP** Cantor, A. H. and Johnson, T. H. inducing pauses in egg production of japanese quail with dietary zinc. *5th Annual Meeting Of The Southern Poultry Science Society, Atlanta, Ga., Usa, Jan. 17-18, 1984. Poult Sci. 63 (Suppl. 1). 1984. 10.*
- Nut def** Cao, G. 1991. [effects of zinc deficiency and supplements on lipid peroxidation and superoxide dismutase in mice] . *Chung-Hua i Hsueh Tsa Chih 71(11): 623-6, 44.*
- Phys** Cao, G. and Chen, J. effects of dietary zinc and free radical generation lipid peroxidation and superoxide dismutase in trained mice. *Archives of Biochemistry and Biophysics. 291 (1). 1991. 147-153.*
- Nut def** Cao, Guohua and Chen, Jidi. effects of dietary zinc on free radical generation, lipid peroxidation, and superoxide dismutase in trained mice. *Arch. Biochem. Biophys. (1991) 291(1): 147-53 .*
- Nut def** Cao, Guohua, Chen, Jidi, Liu, Xiaopeng, and Wu, Yuzhen. effects of zinc deficiency and supplements on lipid peroxidation and superoxide dismutase in mice. *Zhonghua Yixue Zazhi (1991) 71(11): 623-6.*
- Org Met** Cao, J., Godoy, S., Henry, P. R., Liu, L. P., Miles, R. D., and Ammerman, C. B. 1997. relative bioavailability of organic zn sources for chicks. *Journal of Animal Science 75(SUPPL. 1): 188.*
- Gene** Cao J(A), Devis, S. R(A), Cousins, R. J(A), Henry, P. R., Miles, R. D., and Ammerman, C. B. 1999. the effect of dietary zinc sources on metallothionein gene expression in chicks. *FASEB Journal 13(4 PART 1): A579.*
- Nut** Cao, J. P. R. Henry S. R. Davis R. J. Cousins R. D. Miles R. C. Littell and C. B. Ammerman. 2002. relative bioavailability of organic zinc sources based on tissue zinc and metallothionein in chicks fed conventional dietary zinc concentrations. *Animal Feed Science and Technology. 101: 161-170.*
- Carcin** Cao Tongyu, Shannon Mark, Handel Mary Ann, and Etkin Laurence D(A). 1996 . mouse rat finger protein (rfp) proto-oncogene is expressed at specific stages of mouse spermatogenesis. *Developmental Genetics 19(4): 309-320.*
- Gene** Capdevila, M., Cols, N., Romero-Isart, N., Gonzalez-Duarte, R., Atrian, S., and Gonzalez-Duarte, P. recombinant synthesis of mouse zn3-.beta. and zn4-.alpha. metallothionein 1 domains and characterization of their cadmium(ii) binding capacity. *Cell. Mol. Life Sci. (1997) 53(8): 681-688.*
- Nut def** Capel, I. D., Dorrell, H. M., Oakley, J., and Williams, D. C. the influence of zinc on the anti-lewis

lung carcinoma activity of some anti-cancer drugs. *IRCS Med. Sci.: Libr. Compend.* (1980) 8(8): 550.

- Carcin** Capel, Ifor D., Dorrell, Helen M., Pinnock, Marisa H., Jenner, Marilyn, and Williams, Donald C. the influence of zinc status on the anti-lewis lung tumor activity of cisplatin and gallium. *Anticancer Res.* (1981) 1(5): 269-73 .
- FL** Caperna, T. J., Campbell, R. G., and Steele, N. C. 1992. [interrelationship between exogenous porcine growth hormone administration and feeding intake, affecting tissular levels of iron, copper, zinc and bony calcium of growing swine]. <original> interrelaciones entre la administracion de hormona de crecimiento porcina exogena y la ingesta alimenticia, afectando a niveles tisulares de hierro, cobre, zinc y calcio oseo de cerdos en crecimiento. *Anaporc.* (No.117) P. 24-35
- No COC** Caperna, T. J., Campbell, R. G., and Steele, N. C. 1989. interrelationships of exogenous porcine growth hormone administration and feed intake level affecting various tissue levels of iron, copper,zinc and bone calcium of growing pigs. *Journal of Animal Science* 67(3): 654-663.
- CP** Caperna, T. J., Steele, N. C., Campbell, R. G., and Brown, E. G. influence of growth hormone treatment on transferrin levels and iron status of growing pigs. *Meeting Of The American Society For Clinical Nutrition, Inc. Clinical Division Of The American Institute Of Nutrition, Washington, D.C., Usa, April 28-29, 1988. Clin Res.* 36 (3). 1988. 756a.
- Aquatic** CAPON, R. J., ELSBURY, K., BUTLER, M. S., LU, C. C., HOOPER, J. NA, ROSTAS, J. AP, O'BRIEN, K. J., MUDGE, L. M., And SIM, A. TR. extraordinary levels of cadmium and zinc in a marine sponge, *tedania charcoti* topsent: inorganic chemical defense agents. *EXPERIENTIA (BASEL)*; 49 (3). 1993. 263-264.
- Nut** Caprez, Andrea and Fairweather-Tait, Susan J. the effect of heat treatment and particle size of bran on mineral absorption in rats. *Br. J. Nutr.* (1982) 48(3): 467-75 .
- FL** Capurro, M. T. and Beas, F. 1975. [various deliberations over zinc and its clinical importance]. <original> algunas consideraciones sobre el cinc y su importancia en clinica. *Revista Chilena De Pediatria* 46(4): 373-7.
- FL** Carbini, L., Dazzi, E., Lantini, T., Padalino, A. P., and Zucca, G. 1980. histological changes in rats given a diet deficient in zinc, vitamin aor both. *Bollettino Della Societa Italiana Di Biologia Sperimentale* 56(18, II): 225.
- Bio Acc** Carcagno, A. R., Gullace, F. A., Soler, I. J., Fernandez, C. A., Bernardi, A. M. de, and Capaul, E. G. 1993. zinc in blood plasma and hair. concentrations and distribution in 150aberdeen angus steers. *Revista De Medicina Veterinaria (Buenos Aires)* 74(1): 42-46.
- Herp** Carl, T. F., Dufton, C., Hanken, J., and Klymkowsky, M. W. 1999. inhibition of neural crest migration in xenopus using antisense slug rna. *Developmental Biology* 213(1): 101-15.
- CP** Carlisle, E. M., Curran, M. J., and Duong, T. the effect of interrelationships between silicon, aluminum, and the thyroid on zinc content in brain. *Trace Elem. Man Anim. 7: Monogr. Proc., Round Tables Discuss. Int. Symp., 7th : Meeting Date 1990, 12-16-12/17.* Editor(s): Momcilovic, Berislav. Publisher: Inst. Med. Res. Occup. Health Univ. Zagreb, Zagreb, Yugoslavia..
- Abstract** Carlisle, E. M., Curran, M. J., and Duong, T. effect of the thyroid on dietary silicon and aluminum on zinc content in brain. *73RD ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, NEW ORLEANS, LOUISIANA, USA,*

MARCH 19-23, 1989. FASEB (FED AM SOC EXP BIOL) J. 3 (3). 1989. A761.

- Bact** Carlomagno, M. A., Coghlan, L. Graham, and McMurray, D. N. 1986. chronic zinc deficiency and listeriosis in rats : acquired cellular resistance and response to vaccination. *Med. Microbiol. Immunol.* 175(5): 271-80 .
- Abstract** Carlomagno, M. A., Mintzer, C., and McMurray, D. N. nonspecific anti listerial resistance in protein deficient or zinc deficient guinea-pigs vaccinated with bcg. *84TH ANNUAL MEETING OF THE AMERICAN SOCIETY FOR MICROBIOLOGY, ST. LOUIS, MO., USA, MAR. 4-9, 1984. ABSTR ANNU MEET AM SOC MICROBIOL.* 84 (0). 1984. Abstract U27.
- Nut def** Carlomagno, Mirta A. and McMurray, David N. chronic zinc deficiency in rats : its influence on some parameters of humoral and cell-mediated immunity. *Nutr. Res. (N. Y.)* (1983) 3(1): 69-78.
- Nut def** Carlomagno, Mirta A., Mintzer, Carole L., Tetzlaff, Christine L., and McMurray, David N. 1985. differential effect of protein and zinc deficiencies on lymphokine activity in bcg-vaccinated guinea pigs. *Nutr. Res. (N. Y.)* 5(9): 959-68 .
- Unrel** Carlson, Gary P. 1993. formation of fatty acid propyl esters in liver, lung and pancreas of rats administered 1-propanol. *Research Communications in Chemical Pathology and Pharmacology* 81(1): 121-124.
- Mineral** Carlson, M. S., Hill, G. M., and Link, J. E. 1999. early- and traditionally weaned nursery pigs benefit from phase-feeding pharmacological concentrations of zinc oxide: effect on metallothionein and mineral concentrations. *Journal of Animal Science* 77(5): 1199-1207.
- CP** Carlson, M. S., Hill, G. M., and Link, J. E. 1996. the impact of dietary copper and (or) zinc supplementation on hepatic and intestinal cells in growing pigs. *Journal of Animal Science* 74(SUPPL. 1): 182.
- Abstract** Carlson, M. S., Hill, G. M., and Link, J. E. 1997. the impact of phase feeding pharmacological concentrations of zinc to early-weaned pigs. *Journal of Animal Science* 75(SUPPL. 1): 62.
- CP** Carlson, M. S(A), Hoover, S. L., Hill, G. M(A), Link, J. E(A), and Turk, J. R. 1998. effect of pharmacological zinc on intestinal metallothionein concentration and morphology in nursery pig. *Journal of Animal Science* 76(SUPPL. 2): 53.
- Abstract** Carlson, M. S(A), Hoover, S. L(A), Hill, G. M(A), Link, J. E(A), and Ward, T. L. 1997. the impact of organic and inorganic sources of zinc supplementation on intestinal metallothionein concentration in the nursery pig. *Journal of Animal Science* 75(SUPPL. 1): 188.
- No COC** Carmignani, M. and Boscolo, P. 1984. cardiovascular homeostasis in rats chronically exposed to mercuric chloride. *Arch. Toxicol. Suppl.* 7: (Dis. Metab. Reprod. Toxic Response Drugs Other Chem.), 383-8.
- No COC** Carmignani, M., Boscolo, P., Sacchettoni, G., Ripanti, G., and Carelli, G. cardiovascular function, renal ultrastructure and tissue metal levels in rats with long-term exposure to mercuric chloride. *Acta Med. Rom.* (1988) 26(3): 287-97 .
- No Oral** Carmignani, M., Finelli, V. N., and Boscolo, P. mechanisms in cardiovascular regulation following chronic exposure of male rats to inorganic mercury. *Toxicol. Appl. Pharmacol.* (1983) 69(3): 442-50 .
- Gene** Carmona, R., Gonzalez-Iriarte, M., Macias, D., Perez-Pomares, J. M., Garcia-Garrido, L., and

Munoz-Chapuli, R. 2000. immunolocalization of the transcription factor slug in the developing avian heart. *Anatomy and Embryology* 201(2): 103-9.

- CP** Carmona Santana, Ricardo, Ortiz de la Rosa, Benjamin, Escobedo Mex, Jose Guadalupe, and Anon. 1998. <original> determinacion de cu y zn en cuatro localidades ganaderas del municipio de conkal, yucatan. [9. national congress of research and agricultural technological development. proceedings]. <original> 9. congreso nacional de investigacion y desarrollo tecnologico agropecuario. resumenes. 291 P. P. 231
- Abstract** Carney, S. M., Underwood, B. A., and Loerch, J. D. effects of zinc and vitamin a deficiencies on hepatic mobilization and urinary excretion of vitamin a in rats. *FED PROC. Federation Proceedings*. 35 (3). 1976 761
- Nut def** Carney, S. M., Underwood, B. A., and Loerch, J. D. 1976. effects of zinc and vitamin a deficient diets on the hepatic mobilization and urinary excretion of vitamin a in rats. *Journal of Nutrition* 106(12): 1773-81.
- Nut def** Carney, Susan M., Underwood, Barbara A., and Loerch, John D. effects of zinc and vitamin a deficient diets on the hepatic mobilization and urinary excretion of vitamin a in rats. *J. Nutr.* (1976) 106(12): 1773-81.
- CP** Carosa, E., Fanelli, A., Ulisse, S., Di Lauro, R., Rall, J. E., and Jannini, E. A. 1998. ciona intestinalis nuclear receptor 1: a member of steroid/thyroid hormone receptor family. *Proceedings of the National Academy of Sciences of the United States of*
- Bio Acc** Carpena, E., Fedrizzi, G., Cortesi, P., and Cattani, O. 1990. heavy metals (zn, cu, cd) in fish and aquatic birds. *ITAL. J. BIOCHEM* VOL. 39, NO. 2: pp. 133A-134A.
- Phys** Carpenter, David O., Briggs, Dean B., Knox, Anthony P., and Strominger, Norman. excitation of area postrema neurons by transmitters, peptides, and cyclic nucleotides. *J. Neurophysiol.* (1988) 59(2): 358-69 .
- No COC** Carpenter, R. G. and Grossman, S. P. 1983. reversible obesity and plasma fat metabolites. *Physiology & Behavior* 30(1): 51-5.
- Unrel** Carr, J. and Harris, J. growth retardation of ethanol exposed rat fetuses: alterations in metabolism of zinc and metallothionein as possible causes. *FASEB J* 1990;4(3):A515
- FL** Carregal, R. D., Oliveira, P. S. P. F. de, and D'Amico, R. de C. D. 1985. [effect of different zinc levels on the diet of growing rabbits]. <original> efeito de diferentes niveis de zinco na dieta de coelhos em crescimento. *Revista Da Sociedade Brasileira De Zootecnica*. V. 14(1) P. 28-32
- Nut def** Carroll, H. F. 1987. transient neonatal zinc-deficiency.
- Bact** Carroll, P. T. and Smith, L. K. 1990. effect of phospholipase c from bacillus cereus on the release of membrane-bound choline-o-acetyltransferase from rat hippocampal tissue. *Journal of Neurochemistry* 54(3): 1047-55.
- CP** Carter J(A), Beer, W., Hardman, E., Heitman, D., and Cameron, I. 1993. effects of long-term consumption of single dietary fiber types (cellulose, lignin, pectin and guar gum) on rat colonic ph and on bioavailability of calcium, copper, magnesium and zinc. *Proceedings of the American Association for Cancer Research Annual Meeting* 34(0): 553.
- No COC** Carter, J. W. and Koo, S. I. 1984. effects of dietary aroclor 1254 (pcbs) on serum levels of lipoproteincholesterol and tissue distribution of zinc, copper and calcium infischer rats. *Nutrition*

Reports International 29(1): 223-232.

- No COC** Carter, J. W. and Koo, S. I. effects of dietary aroclor 1254 poly chlorinated bi phenyls on serum levels of lipo protein cholesterol and tissue distribution of zinc copper and calcium in fischer rats. *Nutrition Reports International*. 29 (1). 1984. 223-232.
- No COC** CARTER, J. W. and KOO, S. I. evaluation of polychlorobiphenyl aroclor 1254 in an animal model of atherosclerosis. *ARCH ENVIRON CONTAM TOXICOL*; 17 (3). 1988. 307-312.
- No COC** Carter, John W. and Koo, Sung I. effects of dietary aroclor 1254 (pcbs) on serum levels of lipoprotein cholesterol and tissue distribution of zinc, copper and calcium in fischer rats. *Nutr. Rep. Int.* (1984) 29(1): 223-32 .
- No COC** Carter, John W. and Koo, Sung I. evaluation of the polychlorobiphenyl aroclor 1254 in an animal model of atherosclerosis. *Arch. Environ. Contam. Toxicol.* (1988) 17(3): 307-12
- Abstract** Carter, S. D., Richardson, C. R., Mcglone, J. J., and Holthaus, D. L. 1996. effects of a zinc propionate compound on zinc metabolism and growth of nursery pigs. *Journal of Animal Science* 74(SUPPL. 1): 183.
- No Tox** Carubelli, R. and Tulsiani, D. R. 1971. neuraminidase activity in brain and liver of rats during development. *Biochimica Et Biophysica Acta* 237(1): 78-87.
- Phys** Casademunt, E., Carter, B. D., Benzal, I., Frade, J. M., Dechant, G., and Barde, Y. 1999. the zinc finger protein nrif interacts with the neurotrophin receptor p75 super(ntr) and participates in programmed cell death. *Vol. 18, No. 21, Pp. 6050-6061* Embo Journal
- FL** Casarin, A., Fernandez, J. I., and Gonzalez, A. 1997. [effects of zinc-methionine supplementation in the feed for breeding sows]. <original> efectos de la inclusion de un metioninato de zinc en el pienso para las cerdas reproductoras. *Anaporc.* (No.168) P. 76-81
- Drug** Case, T. S., Saltzman, M. J., Cheuk, J., Yazdani, M., Sadeghpour, A., Albrecht, D., Rossowska, M. J., and Nakamoto, T. combined effects of caffeine and alcohol during pregnancy on bones in newborn rats. *Res. Exp. Med.* (1996) 196(3): 179-185.
- Chem Meth** Casella, L. and Gullotti, M. coordination modes of histidine 2. stereochemistry of the reaction between histidine derivatives and pyridoxal analogs conformational properties of zinc ii complexes of histidine schiff bases. *Journal of the American Chemical Society.* 103 (21). 1981. 6338-6347.
- Gene** Cassar-Malek Isabelle, Rochard Pierrick, Wrutniak Chantal, Samarut Jacques, and Cabello Gerard(A). 1997. v-erba, an oncogene stimulating avian myoblast differentiation. *M-S (Medecine Sciences)* 13(8-9): 952-960.
- CP** Cassidy, M. M., Watkins, D. W., and Satchithandam, S. divalent cation balance with dietary fiber or bile sequestrant ingestion in rats. *THIRD CHEMICAL CONGRESS OF NORTH AMERICA HELD AT THE 195TH AMERICAN CHEMICAL SOCIETY MEETING, TORONTO, ONTARIO, CANADA, JUNE 5-10, 1988. ABSTR PAP CHEM CONGR NORTH AM.* 3 (1). 1988. Agfd 114.
- Mix** Caster, W. O. and Doster, Julie M. effect of the dietary zinc/copper ratio on plasma cholesterol level. *Nutr. Rep. Int.* (1979) 19(6): 773-5 .
- Nut def** Caster, W. O. and Resurreccion, Anna V. A. influence of copper, zinc, and protein on biological response to dietary iron. *ACS Symp. Ser.* (1982) 203(Nutr. Bioavailability Iron): 97-105

Gene	Castillo, S. O., Xiao, Q., Kostrouch, Z., Dozin, B., and Nikodem, V. M. 1998. a divergent role of cooh-terminal domains in nurr1 and nur77 transactivation. <i>Gene Expression</i> 7(1): 1-12.
Nut def	Castro, C. E., Alvares, O. F., and Sevall, J. S. 1986. zinc deficiency decreases histone hi0 in rat liver. <i>Nutrition Reports International</i> 34(1): 67-74.
Nut def	Castro, C. E., Kaspian, L. C., Chen, S. S., and Nolker, S. G. 1992. zinc deficiency increases the frequency of single-strand dna breaks in rat liver. <i>Nutrition Research</i> . 12(6): 721-736.
Nut def	Castro, C. E., Xing, C., and Pettersen, C. 1995. effects of zinc deficiency and aluminum ingestion on growth and antioxidant status in rat. <i>FASEB Journal</i> 9(3): A448.
Nut def	Castro, C. Elizabeth, Alvares, Olav F., and Sevall, J. S. zinc deficiency decreases histone h10 in rat liver. <i>Nutr. Rep. Int.</i> (1986) 34(1): 67-74.
Nut def	Castro, C. Elizabeth and Cheng, Pei Ting. zinc deficiency in rat does not alter the major histone patterns in liver nuclei. <i>Nutr. Res. (N. Y.)</i> (1993) 13(5): 541-8
No COC	Castro, L. F. V. de Instituto Nacional de Investigacao Agraria Santarem Portugal Estacao Zootechnica Nacional. 1982. study of the influence of zinc bacitracin and flavomicin on egg production. <original> estudo da influencia da bacitracina de zinco e da flavomicina na producao de ovos. <i>Revista Portuguesa De Ciencias Veterinarias</i> . V. 77(463) P. 179-186
In Vit	Catalanotto, F. and Lacy, P. 1976. effects of dietary zinc-deficiency on taste in rats. <i>Journal Of Dental Research</i> 55: B324.
Nut def	Catalanotto, F. A. effects of dietary methionine supplementation on preferences for sodium chloride solutions. <i>BEHAV BIOL. Behavioral Biology</i> . 24 (4). 1978 (Recd. 1979). 457-466.
Mix	Catalanotto, F. A. and Henkin, R. I. 1972. effects of thiols on sodium chloride preference and copper and zinc metabolism in the rat. <i>Americal Journal of Physiology</i> 222(6): 1594-1598.
Nut def	Catalanotto, Frank A. alterations of short-term tastant-containing fluid intake in zinc deficient adult rats. <i>J. Nutr.</i> (1979) 109(6): 1079-85.
Nut def	Catalanotto, Frank A. gustatory preferences in zinc deficient adult rats. <i>Chem. Senses Flavour</i> (1978) 3(3): 299-305.
Nut def	Catalanotto, Frank A. and Lacy, Peter. effects of a zinc deficient diet upon fluid intake in the rat. <i>J. Nutr.</i> (1977) 107(3): 436-42.
Nut def	Catalanotto, Frank A. and Nanda, Ravindra. the effects of feeding a zinc-deficient diet on taste acuity and tongue epithelium in rats. <i>J. Oral Pathol.</i> (1977) 6(4): 211-20.
No Oral	Cater, Bryan R., Cook, Melvyn W., Gangolli, Sharat D., and Grasso, Paul. studies on dibutyl phthalate-induced testicular atrophy in the rat : effect on zinc metabolism. <i>Toxicol. Appl. Pharmacol.</i> (1977) 41(3): 609-18 .
No COC	Cathcart, E. B., Shelford, J. A., and Peterson, R. G. the effects of calcium carbonate on the apparent digestibility serum concentration and apparent retention of dietary minerals in dairy cattle. <i>Canadian Journal of Animal Science</i> . 63 (1). 1983. 173-180.
Alt	CATLIN, E. A., CHA, C. M., and OH, W. postnatal growth and fatty acid synthesis in overgrown rat pups induced by fetal hyperinsulinemia. <i>METAB CLIN EXP</i> 34:1110-1114,1985

- FL** Caujolle, F., Chanh, P. H., Nguyen-Luong Thi Ngoc-Suong, and van To, P. 339. toxicological study of zinc. i. immediate and deferred toxicity and long-term toxicity. *Agressologie* 10 ISS Jul-Aug 1969
- FL** Caujolle, Fernand, Pham-Huu-Chanh, Nguyen-Luong-Thi-Ngoc-Suong, and Phung Van To. 1969. toxicological study of zinc. i. immediate, deferred, and long-term toxicity. *Agressologie* 10(4): 333-9 .
- No Oral** Caujolle, Fernand, Pham-Huu-Chanh, Nguyen-Luong-Thi-Ngoc-Suong, and Phung Van To. toxicological study of zinc. ii. immediate toxicity produced by continuous intravenous infusion. *Agressologie (1969)* 10(4): 341-7.
- Phys** Cavazos, J. E., Golarai, G., and Sutula, T. P. 1991. mossy fiber synaptic reorganization induced by kindling: time course of development, progression, and permanence. *Journal of Neuroscience* 11(9): 2795-803.
- Nut def** Cavdar, A. O., Bahceci, M., Akar, N., Erten, J., Bahceci, G., Babacan, E., Arcasoy, A., and Yavuz, H. 1988. zinc status in pregnancy and the occurrence of anencephaly in turkey. *Journal Of Trace Elements And Electrolytes In Health And Disease* 2(1): 9-14.
- FL** Ceballos-Picot, I. 1993. [transgenic mice overexpressing copper-zinc superoxide dismutase: a model for the study of radical mechanisms and aging]. <original> les souris transgeniques surexprimant la superoxyde dismutase a cuivre et zinc: un modele d'etude des mecanismes radicalaires et du vieillissement. *Comptes Rendus Des Seances De La Societe De Biologie Et De Ses Filiales*
- Phys** Ceballos-Picot, I., Nicole, A., and Sinet, P. M. 1992. cellular clones and transgenic mice overexpressing copper-zinc superoxide dismutase: models for the study of free radical metabolism and aging. *EXS* 62: 89-98.
- No Oral** Cecava, M. J., Hancock, D. L., and Parker, J. E. 1993. effects of zinc-treated soybean meal on ruminal fermentation and intestinal amino acid flows in steers fed corn silage-based diets. *Journal of Animal Science* 71(12): 3423-3431.
- FL** Cenni, B., Tocchini, M., Verita, P., and Orlandi, M. 1976. use of two antibiotics (chlortetracycline and zinc bacitracin) and agrowth promoter (nitrovin) in feeding broiler fowls. *Atti Della Societa Italiana Delle Scienze Veterinarie* 30: 493-495.
- CP** Cerklewski, F. L. 1983. effect of increased dietary zinc on toxicity and removal of tissue lead in rats. *Federation Proceedings* 42: 1182.
- Unrel** Cerklewski, F. L. 1981. effect of suboptimal zinc nutrition during gestation and lactation on rat molar tooth composition and dental caries. *The Journal Of Nutrition.* 111 (10): 1780-1783.
- Drug** Cerklewski, F. L. 1984. postabsorptive effect of increased dietary zinc on toxicity and removal of tissue lead in rats. *Journal of Nutrition* 114(3): 550-4.
- Mix** Cerklewski, F. L. and Forbes, R. M. 1976. influence of dietary zinc on lead toxicity in the rat. *J. Nutr.* 106(5): 689.
- Nut def** Cerklewski, F. L. and Ridlington, J. W. 1985. influence of zinc and iron on dietary fluoroide utilization in the rat. *The Journal Of Nutrition.* 115(9): 1162-1167.
- Nut def** Cerklewski, Florian L. adaptation to marginal dietary zinc during successive pregnancies in the rat. *Nutr. Rep. Int. (1982)* 26(1): 141-5.

Unrel	Cerklewski, Florian L. effect of suboptimal zinc nutrition during gestation and lactation on rat molar tooth composition and dental caries. <i>J. Nutr.</i> (1981) 111(10): 1780-3
Drug	Cerklewski, Florian L. postabsorptive effect of increased dietary zinc on toxicity and removal of tissue lead in rats. <i>J. Nutr.</i> (1984) 114(3): 550-4.
Mix	Cerklewski, Florian L. and Forbes, Richard M. influence of dietary zinc on lead toxicity in the rat. <i>J. Nutr.</i> (1976) 106(5): 689-96 .
Mix	Cerklewski, Florian L. and Ridlington, James W. influence of zinc and iron on dietary fluoride utilization in the rat. <i>J. Nutr.</i> (1985) 115(9): 1162-7 .
Phys	Cesnjaj, M., Stavljenic, A., and Vukicevic, S. 1991. decreased osteoinductive potential of bone matrix from ovariectomized rats. <i>Acta Orthopaedica Scandinavica</i> 62(5): 471-5.
Alt	CHA, C. M., GELARDI, N. L., and OH, W. accelerated growth and abnormal glucose tolerance in young female rats exposed to fetal hyperinsulinemia. <i>PEDIATR RES</i> 21:83-87,1987
Nut def	Cha, M. C. and Rojhani, A. failure of igf-i infusion to promote growth in zn deficient hypophysectomized rats. <i>J. Trace Elem. Med. Biol.</i> (1998) 12(3): 141-147.
Nut def	Cha, Ming Chuan and Rojhani, Arezoo. zinc deficiency inhibits the direct growth effect of growth hormone on the tibia of hypophysectomized rats. <i>Biol. Trace Elem. Res.</i> (1998) Volume Date 1997, 59(1-3): 99-111.
Diss	Chabanet, D. 1986. [ovine toxicology: epidemiological study from the data of the national veterinary antipoison center and the toxicology laboratory in france, 1980-1983. clinical observations and assays]. <original> toxicologie ovine. etude epidemiologique en france de 1980 a 1983 d'apres les donnees cnitv [centre national d'informations toxicologiques veterinaires] laboratoire de toxicologie. observations cliniques et experimentation. 107 p
Prim	Chadwick, Douglas P., May, Joan C., and Lorenz, Douglas. spontaneous zinc deficiency in marmosets, saguinus mystax. <i>Lab. Anim. Sci.</i> (1979) 29(4): 482-5
Nut def	Chafetz, M. D., Abshire, F. M., and Bernard, D. L. zinc deficiency in adult rats alters foraging in a radial arm maze. <i>Neurol. Neurobiol.</i> (1984) 11B(Neurobiol. Zinc, Part B): 109-19.
Nut def	Chafetz, M. D. and Barbay, S. zinc deprivation and metal chelation effects on reactivity and eight-arm maze behavior. <i>Nutrition and Behavior.</i> 2 (4). 1985 (Recd. 1986). 213-224.
Nut def	Chafetz, M. D. and Duhon, J. 1987. evidence for behavioral regulation of dietary zinc intake. <i>Nutrition and Behavior</i> 3(4): 279-289.
Nut def	Chafetz, Michael D. and Duhon, Jay. evidence for behavioral regulation of dietary zinc intake. <i>Nutr. Behav.</i> (1987) 3(4): 279-89.
Nut	Chai, Mingning and Liu, Huang. effects of zinc supplement to weaning feed on absorption of copper, iron, and calcium. <i>Shipin Kexue (Beijing)</i> (1989) : 119, 20-3 .
No Oral	Chakrabarti, S. and Brodeur, J. 1985. influence of zinc chloride on the metabolism and hepatotoxicity of bromobenzene in rats. <i>Environmental Research</i> 37(1): 192-204.
No Oral	Chakrabarti, Saroj and Brodeur, Jules. influence of zinc chloride on the metabolism and hepatotoxicity of bromobenzene in rats. <i>Environ. Res.</i> (1985) 37(1): 192-204 .

- No Dose** Chakraborty, T. and Biswas, B. B. 1987. ontogenically regulated expression of metallothionein and its messenger rna in chick liver. *Biochemical and Biophysical Research Communications* 147(1): 226-33.
- Fate** Champagne, E. T. and Hinojosa, O. 1987. independent and mutual interactions of copper(ii) and zinc(ii) ions with phytic acid. *Journal Of Inorganic Biochemistry* 30(1): 15-33.
- Alt** Chan, C. P., Hansen, R. J., and Stern, J. S. 1985. protein turnover in insulin-treated, alloxan-diabetic lean and obese zucker rats. *Journal of Nutrition* 115(8): 959-69 .
- Alt** Chan, C. P., Koong, L. J., and Stern, J. S. 1982. effect of insulin on fat and protein deposition in diabetic lean and obese rats. *American Journal of Physiology* 242(1): E19-24.
- HHE** Chan, E. K., Hamel, J. C., Buyon, J. P., and Tan, E. M. 1991. molecular definition and sequence motifs of the 52-kd component of human ss-a/ro autoantigen. *Journal of Clinical Investigation* 87(1): 68-76.
- No Oral** Chan, Hing Man and Cherian, M. George. ontogenic changes in hepatic metallothionein isoforms in prenatal and newborn rats. *Biochem. Cell Biol. (1993)* 71(3-4): 133-40 .
- Not Avail** Chan, J. C. M., Jacob, M., and Smith, J. C. 1979. zinc and growth in rats - effect of steroid-administration.
- Alt** Chan, P. H., Kawase, M., Murakami, K., Chen, S. F., Li, Y., Calagui, B., Reola, L., Carlson, E., and Epstein, C. J. 1998. overexpression of sod1 in transgenic rats protects vulnerable neurons against ischemic damage after global cerebral ischemia and reperfusion. *Journal of Neuroscience* 18(20): 8292-9.
- No COC** Chan, P. H., Longar, S., and Fishman, R. A. 1987. protective effects of liposome-entrapped superoxide dismutase on posttraumatic brain edema. *Annals of Neurology* 21(6): 540-7.
- Alt** Chan, P. H., Yang, G. Y., Chen, S. F., Carlson, E., and Epstein, C. J. 1991. cold-induced brain edema and infarction are reduced in transgenic mice overexpressing cuzn-superoxide dismutase. *Annals of Neurology* 29(5): 482-6.
- Alt** Chan Pak H(A), Kamii Hideyuki, Yang Guoyuan, Gafni Juliette, Epstein Charles J, Carlson Elaine, and Reola Liza. 1993. brain infarction is not reduced in sod-1 transgenic mice after a permanent focal cerebral ischemia. *Neuroreport* 5(3): 293-296.
- CP** Chan, W., Calhoun, N. R., Howard, M. P., and Smith, J. C. 1979. zn-65 retention, plasma and bone zinc concentration - affected by of dietary-protein in rats. *Federation Proceedings* 38: 606.
- CP** Chan, W., Calhoun, N. R., Howard, M. P., and Smith, J. C. Jr. 1979. 65zinc retention, plasma and bone zinc concentration: affected byof dietary protein in rats. *Federation Proceedings* 38(3, I): 606.
- Abstract** Chan, W., Calhoun, N. R., and Smith, J. C. Jr. effect of dietary protein on urinary excretion of calcium and zinc. *FED PROC. Federation Proceedings.* 37 (3). 1978 847
- No Tox** Chan, W., Calhoun, N. R., and Smith, J. C. Jr. CS Veterans. effect of dietary protein on urinary excretion of calcium and zinc.
- CP** Chan, W. Y., Bates, J. M. Jr., Chung, K. W., and Rennert, O. M. 1986. abnormal zinc metabolism in unilateral maldescended testes of a mutant rat strain. *Proceedings of the Society*

For Experimental Biology and Medicine. 182(4): 549-558.

- Nut def** Chan, W. Y., Chung, K. W., Bates, J., Blomberg, L., and Rennert, O. M. 1981. organ specific zinc deficiency in testicular feminization rats: hormone-metal interaction. *Biochemical And Biophysical Research Communications.* 102 (2): 630-635.
- Rev** Chan, W. Y. and Rennert, O. M. 1985. genetic trace metal disturbances. *Journal of the American College of Nutrition* 4(1): 39-48.
- Alt** Chan, W. Y. LIFSA, Chung, K. W., Bates, J. M. Jr., LeBlanc, M., and Tease, L. A. 1983. zinc metabolism in testicular feminization and surgical cryptorchid testes in rats. *Life Sciences.* 32 (11): 1279-1284.
- FL** Chan YanZhen, Li QiFeng, Zhao YuLan, Qiao Liang, and Sun GuangDong. 1998. effect of supplement of zinc oxide on the performance of early weaningpiglets. *Chinese Journal of Animal Science* 34(4): 22-23.
- In Vit** Chandler, J. A., Sinowatz, F., Timms, B. G., and Pierrepont, C. G. the subcellular distribution of zinc in dog prostate studies by x-ray microanalysis. *Cell Tissue Res. (1977)* 185(1): 89-103 .
- Nut def** Chandler, J. A., Timms, B. G., and Battersby, S. prostate development in zinc-deficient rats. *The Prostatic Cell : ; Structure And Function / ; Editors, Gerald P. Murphy, Avery A. Sandberg, James P. Karr.* p. 475-490. ill.
- Nut def** Chandra, R. K., Heresi, Gloria, and Au, Bing. serum thymic factor activity in deficiencies of calories, zinc, vitamin a and pyridoxine. *Clin. Exp. Immunol. (1980)* 42(2): 332-5 .
- Phys** Chandrasiri, V., Bau, H. M., Villaume, C., Giannangeli, F., and Mejean, L. 1990. effect of germinated and heated soybean meals on plasma cholesterol and triglycerides in rats. *Reproduction, Nutrition, Development* 30(5): 611-8.
- Sludge** Chaney, Rufus L., Stoewsand, Gilbert S., Bache, Carl A., and Lisk, Donald J. cadmium deposition and hepatic microsomal induction in mice fed lettuce grown on municipal sludge-amended soil. *J. Agric. Food Chem. (1978)* 26(4): 992-4 .
- No Oral** CHANG, C., MANN, D. E. JR, and GAUTIERI, R. F. teratogenicity of zinc chloride,1,10-phenanthroline,and a zinc-1,10-phenanthroline complex in mice. *J PHARMACEUT SCI* 66:1755-1758,1977
- Drug** Chang, C. H. and Waibel, P. E. efficacy of zinc bacitracin and sources of unidentified growth factors with corn-m soy bean-d meal type diet for turkey poults. *POULTRY SCI.* 49 (3). 1970 733-743.
- Nut** Chang, Chao-Wu. detoxification effect of aluminum, vitamin b6 and zinc on the performance of broilers fed 10% salvadoran leucaena diet. *Tung-Hai Hsueh Pao (1987)* : 28, 999-1007.
- Prim** Chang, Charles and Scott, Rachel E. cerebral zinc content during normal development and the effects of altered protein synthesis. *Fetal Postnatal Cell. Growth (1975)* 99-109. Editor: 99-109. Editor(s): Cheek, Donald B. Publisher: Wiley, New York, N. Y..
- Nut def** Chang, I-Chia Hsu, Harrill, Inez, and Gifford, Elizabeth D. 1969. influence of zinc and vitamin d on bone constituents of the rat. *Metab. Clin. Exp.* 18(7): 625-9.
- Nut def** Chang, I. H., Harrill, I., and Gifford, E. D. 1969. influence of zinc and vitamin d on bone

constituents of the rat. *Metabolism: Clinical and Experimental* 18(7): 625-9.

- No Oral** Chang, Louis W. and Dyer, Robert S. trimethyltin induced zinc depletion in rat hippocampus. *Neurol. Neurobiol.* (1984) 11B(Neurobiol. Zinc, Part B): 275-90.
- Alt** Chang, Soon Hee, Cho, Soo Yeul, and Park, Mi Lee. effect of calcium and magnesium on the lipid and mineral composition of serum and tissues in cholesterol-fed rats. *Han'Guk Yongyang Siklyong Hakhoechi* (1988) 17(2): 176-83 .
- OAC** Chang, Yehji, Zhang, Wenzhong, and Tao, Jinguang. 1988. x-ray microanalysis of trace elements during coronary atherosclerosis. *Huazhong Gongxueyuan Xuebao* 16(1): 17-22 .
- FL** Chanin, B. E., Hamilton, D. L., Hancock, D. S., and Schiefer, H. B. biointeraction of dietary t-2 toxin and zinc in mice. *Can. J. Physiol. Pharmacol.* (1984) 62(10): 1320-6
- Diss** Chanin-Olson, Barbara Eloise. 1985. the absorption and metabolism of zinc in the zinc deficient and replete mouse and interactions with cadmium and copper. *Avail.: NLC From: Diss. Abstr. Int. B* 1986. 46. 12. Pt. 1, 4147. ,907680
- Nut def** Chanmugam, P., Wheeler, C., and Hwang, D. H. 1984. the effect of zinc deficiency on prostaglandin synthesis in rat testes. *The Journal Of Nutrition.* 114(11): 2066-2072.
- Nut def** Chanmugam, P., Wheeler, C., and Hwang, D. H. 1984. fatty acid composition of the testes of zinc-deficient rats: the effect of docosapentaenoic acid supplementation. *The Journal Of Nutrition.* 114(11): 2073-2079.
- Diss** Chanmugam, Prithiva. 1983. the effect of zinc nutriture on prostaglandin synthesis and fatty acid composition in rat testes. *Avail.: Univ. Microfilms Int. Order No. DA8409575 From: Diss. Abstr. Int. B* 1984, 45. 1. 130. 102 pp.
- Nut def** Chanmugam, Prithiva, Wheeler, Catherine, and Hwang, Daniel H. the effect of zinc deficiency on prostaglandin synthesis in rat testes. *J. Nutr.* (1984) 114(11): 2066-72
- Nut def** Chanmugam, Prithiva, Wheeler, Catherine, and Hwang, Daniel H. fatty acid composition of the testes of zinc-deficient rats : the effect of docosapentaenoic acid supplementation. *J. Nutr.* (1984) 114(11): 2073-9
- Nut def** Channa, M. L., Burger, F. J., Ubbink, J. B., and Reinach, S. G. zinc, copper and iron balance in the vitamin b-6-deficient rat. *Int. J. Vitam. Nutr. Res.* (1994) 64(3): 204-11.
- No Oral** Chaoui, Abdelilah, Mazhoudi, Salma, Ghorbal, Mohamed Habib, and El Ferjani, Ezzedine. cadmium and zinc induction of lipid peroxidation and effects on antioxidant enzyme activities in bean (*phaseolus vulgaris* l.). *Plant Sci. (Shannon Irel.)* (1997): 127(2), 139-147.
- Alt** CHAPMAN, R. H. and STERN, J. M. maternal stress and pituitary-adrenal manipulations during pregnancy in rats: effects on morphology and sexual behavior of male offspring. *J COMP PHYSIOL PSYCHOL* 92:1074-1083,1978
- Nut def** Chareonpong-Kawamoto, N. and Yasumoto, K. 1995. selenium deficiency as a cause of overload of iron and unbalanced distribution of other minerals. *Bioscience, Biotechnology, and Biochemistry* 59(2): 302-6.
- CP** Charles-Shannon, V. L., Sasser, L. B., Burbank, D. K., and Kelman, B. J. 1981. the influence of zinc on the ontogeny of hepatic metallothionein in the fetal rat. *Proceedings of the Society for Experimental Biology and Medicine*; 168

- FL** Charles Terezinha Padilha(A), Campos Oriel Fajardo De(A), and Liziere Rosane Scatamburlo. 1994. use of the glutaraldehyde coagulation test as an indicator of the immunoglobulin level in serum of neonatal calves. *Revista Da Sociedade Brasileira De Zootecnia* 23(1): 65-72.
- Fate** Charton, G., Rovira, C., Ben-Ari, Y., and Levie, V. 1985. spontaneous and evoked release of endogenous zn^{2+} in the hippocampal mossy fiber zone of the rat in situ. *Experimental Brain Research. Experimentelle Hirnforschung*.
- OAC** CHATTERJEE, J., BASU, D., BASU, S. K., DAS, A. K., GHOSAL, S. K., MIDYA, T., and BHATTACHERJEE, S. changes in the zinc concentration in testicular cells of male swiss albino mice irradiated with different doses of x-ray. *INDIAN J PHYSIOL ALLIED SCI*; 43 (4). 1989. 141-145.
- Unrel** Chatterjee, J., De, K., Basu, S. K., and Das, A. K(A). 1994. alteration of spermatozoal structure and trace metal profile of testis and epididymis of rat under chronic low-level x-ray irradiation. *Biological Trace Element Research* 41(3): 305-319.
- Carcin** Chattopadhyay Subrata and Freake Hedley C(A). 1998. zinc chelation enhances thyroid hormone induction of growth hormone mrna in gh3 cells. *Molecular and Cellular Endocrinology* 136(2): 151-157.
- In Vit** Chatteraj, S. and Majumder, A. L. 1986. modification of brain fructose-1,6-bisphosphatase activity by chelators: "induction" of 5'-amp sensitivity. *Biochemical and Biophysical Research Communications* 139(2): 571-80.
- Nut def** Chaudhry, I. M., Gandor, D. W., and Gerson, S. J. reduction of carbonic anhydrase activity in the submandibular salivary glands of zinc deficient rats. *ARCH ORAL BIOL. Archives of Oral Biology*. 26 (5). 1981. 399-402.
- Abstract** Chaudhry, I. M., Meyer, J., and Gandor, D. effect of nutritional changes on alkaline phosphatase and pyrophosphatase. *ANNUAL SESSION OF THE AMERICAN ASSOCIATION FOR DENTAL RESEARCH, WASHINGTON, D.C., USA, MAR. 12-15, 1986. J DENT RES*. 65 (Spec. Issue). 1986. 324.
- Prim** Chaudhuri, A. and Cynader, M. S. 1993. activity-dependent expression of the transcription factor zif268 reveals ocular dominance columns in monkey visual cortex. *Brain Research* 605(2): 349-53.
- Nut** Chavez, E., Laurenz, J. C., Greene, L. W., Byers, F. M., and Schelling, G. T. 1989. apparent absorption of phosphorus, magnesium, zinc, and copper in twobreds of cows. <document title>beef cattle research in texas, 1988. 200-207.
- No COC** Chavrier, P., Lemaire, P., Revelant, O., Bravo, R., and Charnay, P. 1988 . characterization of a mouse multigene family that encodes zinc fingerstructures. *Molecular and Cellular Biology* 8(3): 1319-1326.
- Phys** Cheema, Abdul Majeed and Khan, Muhammad Naeem. some chemical constituents of accessory sex organs in different functional states of endocrine pancreas in male rats. *Pak. J. Biochem.* (1987) 20(1-2): 17-21 .
- FL** Chelyshev Yu A. neuro histological and histochemical data on additional fiber of some encapsulated receptors. *Arkhiv Anatomii Gistologii i Embriologii*. 76 (4). 1979. 45-51.
- FL** Chemineau, P., Levy, F., and Cognie, Y. 1984. the buck effect - physiological mechanisms. <document title>reproduction des ruminants en zone tropicale. reunioninternationale, pointe-a-

pitre, guadeloupe, 8-10 juin 1983. 473-485.

- Unrel** Chemineau, P., Levy, F., and Thimonier, J. 1986. effects of anosmia on lh secretion, ovulation and oestrous behaviour induced by males in the anovular creole goat. *Animal Reproduction Science* 10(2): 125-132.
- Gene** Chen, C. Y. and Schwartz, R. J. 1997. competition between negative acting yy1 versus positive acting serum response factor and tinman homologue nkx-2.5 regulates cardiac alpha-actin promoter activity. *Molecular Endocrinology* 11(6): 812-22.
- Alt** Chen Chunying(A), Zhou Jinyan, Xu Huibi, Jiang Yan, and Zhu Guanfu. 1997. effect of selenium supplementation on mice infected with lp-bm5 mulv, a murine aids model. *Biological Trace Element Research* 59(1-3): 187-193.
- In Vit** CHEN, D., WAITE, L. C., and PIERCE, W. M JR. in vitro bone resorption is dependent on physiological concentrations of zinc. *Biological Trace Element Research*; 61 (1). 1998. 9-18.
- Alt** Chen, D., Waite, L. C., and Pierce, W. M. Jr. in vitro effects of zinc on markers of bone formation. *Biol. Trace Elem. Res.* (1999) 68(3): 225-234.
- In Vit** Chen, H., Noble, F., Coric, P., Zaluski, M. F., and Roques, B. P. 1998. aminophosphinic inhibitors as transition state analogues of enkephalin-degrading enzymes: a class of central analgesics. *Vol. 95, No. 20, Pp. 12028-12033* Proc. Natl. Acad. Sci. Usa
- Nut def** Chen, Hui Jun, Kimura, Mieko, and Itokawa, Yoshinori. effects of riboflavin deficiency on tissue mineral concentration and glutathione peroxidase activity in rats. *Maguneshumu (Kyoto)* (1998) Volume Date 1997, 16(2): 97-105.
- Nut def** Chen, Huijun, Kimura, Mieko, and Itokawa, Yoshinori. changes in iron, calcium, magnesium, copper, and zinc levels in different tissues of riboflavin-deficient rats. *Biol. Trace Elem. Res.* (1997) 56(3): 311-319.
- Drug** Chen Huixiong, Noble Florence, Mothe Aurelie, Meudal Herve, Coric Pascale, Danascimento Sophie, Roques Bernard P(A), George Pascal, and Fournie-Zaluski Marie-Claude. 2000. phosphinic derivatives as new dual enkephalin-degrading enzyme inhibitors: synthesis, biological properties, and antinociceptive activities. *Journal of Medicinal Chemistry* 43(7): 1398-1408.
- Alt** Chen, M. D., Lin, P. Y., Chen, P. S., Cheng, V., and Lin, W. H. 1997. zinc attenuation of gdp binding to brown adipocytes mitochondria in genetically obese (ob/ob) mice. *Biological Trace Element Research*. 57(2): 139-145.
- Phys** Chen, M. D. and Lin, W. H. 1993. [effects of fasting and diet resupplementation on the variation of blood zinc, copper, calcium and magnesium levels in two laboratory rodents: dba/2 mouse and sd rat]. *[Chung-Hua i Hsueh Tsa Chih]* 51(5): 361-7.
- Alt** Chen, Ming-Der, Lin, Pi-Yao, Cheng, Vie, and Lin, Wen-Han. zinc supplementation aggravates body fat accumulation in genetically obese mice and dietary -obese mice. *Biol. Trace Elem. Res.* (1996) 52(2): 125-132 .
- Phys** Chen, Ming Der, Lin, Pi Yao, and Lin, Wen Han. investigation of the relationships between zinc and obesity. *Gaoxiong Yixue Kexue Zazhi* (1991) 7(12): 628-34.
- Alt** Chen, Ming-Der, Lin, Pi-Yao, and Lin, Wen-Han. 1998. zinc supplementation on serum levels and hepatic conversion of thyroid hormones in obese (ob/ob) mice. *Biol. Trace Elem. Res.* 61(1): 89-96 .

- Phys** Chen, Q. X., Perkins, K. L., and Wong, R. K. S. 1998. zn^{2+} blocks the nmda- and ca^{2+} - triggered postexposure current ipe in hippocampal pyramidal cells. *Journal of Neurophysiology* 79(2): 1124-6.
- Phys** Chen, Qiang X., Perkins, Katherine L., and Wong, Robert K. S. zn^{2+} blocks the nmda- and ca^{2+} - triggered postexposure current ipe in hippocampal pyramidal cells. *J. Neurophysiol.* (1998) 79(2): 1124-1126.
- Phys** Chen Qiang X, Perkins Katherine L(A), and Wong Robert K S. 1998. zn^{2+} blocks the nmda- and ca^{2+} -triggered postexposure current ipe in hippocampal pyramidal cells. *Journal of Neurophysiology (Bethesda)* 79(2): 1124-1126.
- Rev** Chen, R. W., Eakin, D. J., and Whanger, P. D. biological function of metallothionein. ii. its role in zinc metabolism in the rat. *Nutr. Rep. Int.* (1974) 10(4): 195-200 .
- Nut def** Chen, R. W., Vasey, E. J., and Whanger, P. D. accumulation and depletion of zinc in rat liver and kidney metallothioneins. *J. Nutr.* (1977) 107(5): 805-13 .
- Nut def** Chen, S. Y. 1986. autoradiographic study of cell proliferation in acanthotic buccal epithelium of zinc-deficient rabbits. *Archives of Oral Biology* 31(8): 535-9.
- Nut def** Chen, S. Y. 1980. histologic alterations of zinc-deficient rabbit oral-mucosa. *Journal Of Dental Research* 59: 279.
- Nut def** Chen S-Y. morphologic alterations of oral mucosa in zinc deficient rabbits. *ARCH ORAL BIOL. Archives of Oral Biology.* 25 (6). 1980. 377-384.
- Nut def** Chen, S. Y. 1988. studies on cell-migration, adenylate-cyclase and membrane-coating granules in the buccal epithelium of the zinc-deficient rabbit, including the influence of isoproterenol. *Archives Of Oral Biology* 33(9): 645-651.
- No COC** Chen, S. Y., Collipp, P. J., and Hsu, J. M. the effect of sodium selenite toxicity on tissue distribution of zinc, iron, and copper in rats. *Biol. Trace Elem. Res.* (1985) 7(3): 169-79 .
- Nut def** Chen, S. Y., Meyer, J., and Gerson, S. 1975. the parakeratin layer of zinc-deficient rat buccal epithelial. *Pharmacology and Therapeutics in Dentistry* 2(2): 83-95.
- Nut def** Chen, Shu-Ming and Young, Tze-Kong. effects of zinc deficiency on endogenous antioxidant enzymes and lipid peroxidation in glomerular cells of normal and five-sixths nephrectomized rats. *J. Formosan Med. Assoc.* (1998) 97(11): 750-756.
- Nut def** Chen, Sow-Yeh, Meyer, Julia, and Gerson, Stanley. parakeratin layer of zinc-deficient rat buccal epithelium. *Pharmacol. Ther. Dent.* (1975) 2(2): 83-95.
- CP** Chen W-J A(A), Berryhill, E. C(A), Parnell, S. E(A), and West, J. R(A). 1999. the effect of zinc supplementation on alcohol-induced purkinje cell loss in the developing cerebellar vermis. *Alcoholism Clinical and Experimental Research* 23(5 SUPPL.): 28A.
- Nut def** Chen, Y., Saari, J. T., and Kang, Y. J. 1995. copper deficiency increases metallothionein-i mrna content selectively in rat liver. *The Journal Of Nutritional Biochemistry.* 6(11): 572-576.
- Phys** Chen, Y., Whitney, P. L., and Frank, L. 1994. comparative responses of premature versus full-term newborn rats to prolonged hyperoxia. *Pediatric Research* 35(2): 233-7.
- FL** Chen Yanzhen(August 1st Land Reclamation Uni., Mishan Heilongjiang China College of Animal

Science and Technology. 1998. effect of zinc oxide additive on the performance of early weanling piglets. <original> zaoqi duannai zizhu riliang zhong tianjia yanghuaxin de shiyan. *Chinese Journal of Animal Science*. <Subtitle>Zhongguo Xumu Zazhi (China). V. 34(4) P. 22-23

- QAC** Chen, Z., Wu, H., Zhang, Y., and Shu, H. 1997. effect of "jia wei fo shou san" on erythrocyte membrane calcium, zinc concentration in pregnant rats with asymmetrical intrauterine growth retardation induced by passive smoking. *Journal of Tongji Medical University* 17(4): 218-20.
- Gene** Chen, Z. F., Paquette, A. J., and Anderson, D. J. 1998. nr5f2 is required in vivo for repression of multiple neuronal target genes during embryogenesis [see comments]. *Nature Genetics* 20(2): 136-42.
- FL** Chen ZhongMing (et al.). 1998. the effect of zinc on the performance of breeding hens. *Journal of Henan Agricultural Sciences* (9): 33.
- Carcin** Cheng, G., Cleary, A. M., Ye, Z. S., Hong, D. I., Lederman, S., and Baltimore, D. 1995. involvement of craf1, a relative of traf, in cd40 signaling. *Science* 267(5203): 1494-8.
- CP** Cheng, G. X., Zhu, X. H., Men, X. Q., Wang, L., Huang, Q. H., Jin, X. L., Xiong, S. M., Zhu, J., Guo, W. M., Chen, J. Q., Xu, S. F., So, E., Chan, L. C., Waxman, S., Zelent, A., Chen, G. Q., Dong, S., Liu, J. X., and Chen, S. J. 1999. distinct leukemia phenotypes in transgenic mice and different corepressor interactions generated by promyelocytic leukemia variant fusion genes plzf-raralpha and npm-raralpha. *Proceedings of the National Academy of Sciences of the United States of*
- Abstract** Cheng, J. and Kornegay, E. T. 1995. comparison of zinc sulfate and a zinc lysine complex as zinc source for young pigs fed lysine deficient and adequate diets. *Journal of Animal Science* 73(SUPPL. 1): 172.
- Nut def** Cheng, J., Kornegay, E. T., and Schell, T. 1998. influence of dietary lysine on the utilization of zinc from zincsulfate and a zinc-lysine complex by young pigs. *Journal of Animal Science* 76(4): 1064-1074.
- Abstract** Cheng, J., Schell, T. C., and Kornegay, E. T. 1995. influence of dietary lysine on the utilization of zinc from zinc sulfate and a zinc lysine complex by young pigs. *Journal of Animal Science* 73(SUPPL. 1): 17.
- Mix** CHENG, S. and ET, A. L. observation by quantitative electron microscopy of the protective action of zinc on the liver against cadmium damage. *CHIN J PREV MED*; 22 (3). 1988. 161-163.
- Unrel** Cheng, Yiyong, Chen, Xingwei, Wang, Donglan, Li, Xiaoyan, and Lin, Chuenzhu. effects of zinc on collagen synthesis and wound healing in rats. *Yingyang Xuebao* (1992) 14(1): 70-5.
- No COC** Chengelis, C. P., Dodd, D. C., Means, J. R., and Kotsonis, F. N. 1986. protection by zinc against acetaminophen induced hepatotoxicity in mice. *Fundamental and Applied Toxicology* 6(2): 278-84.
- Org Met** Chentsova, N. Yu. danger to poultry during scattering of zinc phosphide-poisoned grain to control rodents in forest plantings. *Vliyanie Pestits. Dikikh Zhivotn. (1972)* 90-102. Editor: 90-102. Editor(s): Voronova, L. D. Publisher: Tsentr. Lab. Okhr. Prir., Moscow, USSR..
- No Oral** Cherian, M. G., Templeton, D. M., Gallant, K. R., and Banerjee, D. 1987. biosynthesis and metabolism of metallothionein in rat during perinatal development. *Experientia Suppl.* 52: (Metallothionein 2), 499-505.

- FL** Cherkasova, E. V. effect of zinc on oxygen consumption, phagocytosis, and the development of pliss lymphosarcoma. *Vop. Onkol. (1968)* 15(2): 81-5.
- FL** Cherkasova, E. V. 1969. [the effect of zinc on oxygen consumption, phagocytosis and the development of pliss lymphosarcoma]. <original> vliianie tsinka na potreblenie kisloroda, fagotsitoz i razvitie limfosarkomy plissa. *Voprosy Onkologii* 15(2): 81-5.
- CP** Cherkasova, E. V. 1969. effect of zinc on the intensity of the oxygen requirements of rats. *Mater. Konf. Fiziol. Respub. Srednei Azii Kaz. 4th* : Meeting Date 1968, Volume 2, 280-2. Editor(s): Bazanova, N. U. Publisher: "Nauka" Kaz. SSR, Alma-Ata, USSR..
- FL** Chernov, O. V. and Khitsenko, I. I. 1971. the blastomogenic properties of some dithiocarbamic acid derivatives (the herbicides zineb and ziram. *Vopr. Onkol.;* 15(4)
- No Dose** Cherry, J. A., Beane, W. L., and Weaver, W. D. Jr. continuous vs. intermittent photoperiod under low intensity illumination. *Poultry Science.* 59 (7). 1980. 1550-1551.
- No COC** Cherubini, E., Martina, M., Sciancalepore, M., and Strata, F. 1998. gaba excites immature ca3 pyramidal cells through bicuculline-sensitive and -insensitive chloride-dependent receptors. *Perspectives on Developmental Neurobiology* 5(2-3): 289-304.
- CP** Chesters, J. K. 1971. problems caused by variation in food intake in experiments on protein and nucleic acid metabolism. *Proceedings of the Nutrition Society* 30(1): 1-7.
- Nut def** Chesters, J. K. 1983. zinc metabolism in animals: pathology, immunology and genetics. *Journal of Inherited Metabolic Disease* 6 Suppl 1: 34-8.
- CP** Chesters, J. K. and Petrie, L. 5s ribosomal rna synthesis in zinc-deficient rats . *Trace Elements In Man And Animals 6 / Edited By Lucille S. Hurley, ... [Et Al.]*. p. 299-300.
- Nut def** Chesters, J. K. and Quarterman, John. effects of zinc deficiency on food intake and feeding patterns of rats. *Brit. J. Nutr. (1970)* 24(4): 1061-9.
- Nut def** Chesters, J. K. and Will, M. 1973. some factors controlling food intake by zinc deficient rats. *British Journal of Nutrition.* 30(3): 555-566.
- Nut def** Chesters, J. K. and Will, Marie . factors controlling food intake by zinc-deficient rats. *Brit. J. Nutr. (1973)* 30(3): 555-66.
- Food** Chesters, John K., Boyne, Ronald, and Petrie, Linda. effects of growth , food intake, and dietary zinc on diadenosine tetraphosphate concentrations in rats. *J. Nutr. Biochem. (1990)* 1(2): 107-10.
- Nut def** Chesters, John K. and Petrie, Linda. effect of dietary zinc deficiency on 5 s ribosomal rna synthesis in rats. *Biochem. Soc. Trans. (1987)* 15(5): 846.
- CP** Chetty, K. N. and Dhannavada, S. R. effects of chlordecone on immune response and certain trace metal levels in rats fed different dietary calcium and protein regimen. *75TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ATLANTA, GEORGIA, USA, APRIL 21-25, 1991. FASEB (FED AM SOC EXP BIOL) J.* 5 (5). 1991. A1386.
- No Control** Chhabra, A. and Arora, S. P. 1985. effect of zn deficiency on serum vitamin a level, tissue enzymes and histological alterations in goats. *Livestock Production Science* 12(1): 69-77.

- Nut def** Chhabra, A. and Arora, S. P. histological alterations in certain tissues of goats fed zinc and vitamin a-deficient diets. *Indian Journal of Animal Sciences*. 59 (9). 1989. 1045-1048.
- Nut** Chhabra, A., Arora, S. P., and Kishan, J. the effect of dietary zinc on beta carotene conversion to vitamin a. *Indian Journal of Animal Sciences*. 50 (10). 1980. 879-881.
- Mix** Chhabra, A., Arora, S. P., and Kishan, J. 1980. note on the effect of dietary zinc on beta - carotene conversion to vitamin a. *Indian Journal of Animal Sciences* 50(10): 879-881.
- Nut def** Chhabra Aruna and Arora, S. P. 1993. effect of vitamin a and zinc supplement on alcohol dehydrogenase and superoxide dismutase activities of goat tissues. *Indian Journal of Animal Sciences* 63(3): 334-338.
- HHE** Chiarantini, L., Rossi, L., Fraternali, A., and Magnani, M. 1995. modulated red blood cell survival by membrane protein clustering. *Molecular and Cellular Biochemistry* 144(1): 53-9.
- Nut def** Chiba, Hiroshige, Takasaki, Misao, Masuyama, Ritsuko, Uehara, Mariko, Kanke, Yusuke, Suzuki, Kazuharu, and Goto, Shiro. 1998. time course of change in hepatic lipid peroxide level in iron-deficient rats. *Nippon Eiyo Shokuryo Gakkaishi* 51(4): 201-206
- No Oral** Chiba, M. and Kikuchi M. 1985. the in vivo and in vitro effects of manganese and zinc on the activity of erythrocyte delta-aminolevulinic acid dehydratase. *Nutr.Res. Suppl.I*: 568-571.
- No COC** CHIBA, T., TERAOKI, Y., and NAGUMO, K. influence of chelating agent edta on the development of chick embryo, with particular reference to effects on fluid electrolyte levels. *TERATOLOGY* 24(1):17A,1981
- No Oral** Chikosi, S. F. McMaster D. and Love A. H. G. 1985. an improved model of the perfused rat intestine for the study of zinc absorption. *Nutr.Res. Suppl.I*: 255-258.
- Abstract** Chin, J. M., Clegg, M. S., Ferrell, M. F., Metzler, G. L., and Keen, C. L. relationship between calcium and sodium in the development of hypertension and altered mineral metabolism in dahl s rats. 71ST ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, WASHINGTON, D.C., USA, MARCH 29-APRIL 2, 1987. *FED PROC.* 46 (3). 1987. 889.
- BioX** Chirase, N. K., Hutcheson, D. P., and Thompson, G. B. 1991. feed intake, rectal temperature, and serum mineral concentrations of feedlot cattle fed zinc oxide or zinc methionine and challenged with infectious bovine rhinotracheitis virus. *Journal of Animal Science* 69(10): 4137-4145.
- Mix** Chirase, N. K. and L. W. Greene. 2001. *Dietary Zinc and Manganese Sources Administered From the Fetal Stage Onwards Affect Immune Response of Transiently Stressed and Virus Infected Offspring Steer Calves* *Animal Feed Science and Technology*. 93: 217-228.
- Mineral** Chiy, P., Fuente, M. de la, Barrado, E., Vega, M., and Phillips, C. 1998 . determination of mineral balances in sheep offered feed with added cadmium and zinc. *Fresenius' Journal of Analytical Chemistry* 361(4): 343-348.
- No Oral** Chmielnicka, J., Nasiadek, M., Brzezniak, E., Papierz, W., and Kaluzynski, A. urinary excretion of zinc and copper as indicators of alkylmercuric compounds nephrotoxicity in rats. *Journal of Trace Elements in Experimental Medicine*. 2 (4). 1989. 331-342.
- No Oral** Chmielnicka, Jadwiga, Komsta-Szumaska, Elzbieta, and Zareba, Grazyna. 1983. effect of interaction between zinc 65, mercury and selenium in rats (retention, metallothionein, endogenous copper). *Arch. Toxicol.* 53(2): 165-75 .

- No COC** Chmielnicka, J. and Nasiadek, M. 1991. tissue distribution and urinary excretion of essential elements in rats orally exposed to aluminum chloride. *Biological Trace Element Research*. 31(2): 131-138.
- No Dose** Cho, C. H., Chen, S. M., Ogle, C. W., and Young, T. K. 1989. effects of zinc and cholesterol choleate on serum-lipoproteins and the liver in rats. *Life Sciences* 44(25): 1929-1936.
- Nut def** Cho, C. H., Fong, L. Y. Y., Ma, P. C. C., and Ogle, C. W. 1987. zinc-deficiency - its role in gastric-secretion and stress-induced gastric-ulceration in rats. *Pharmacology Biochemistry And Behavior* 26(2): 293-297.
- Phys** Cho, C. H. and Ogle, C. W. the inhibitory action of zinc on gastric secretion and on stress-induced gastric ulceration in rats. *Trace Subst. Environ. Health* (1987) : 21, 567-73 .
- No Oral** Cho, Chi H. and Ogle, Clive W. a correlative study of the antiulcer effects of zinc sulfate in stressed rats. *Eur. J. Pharmacol.* (1978) 48(1): 97-105.
- Nut def** Cho, Soo Yeul, Jeong, Jae Hong, and Park, Jong Min. effects of dietary zinc and ethanol on the zinc content of serum and tissues in rat. *Han'Guk Yongyang Siklyong Hakhoechi* (1990) 19(1): 80-6.
- Nut def** Cho, Soo-Yeul and Kim, Myung-Joo. effect of dietary zinc levels on cadmium-induced hepatotoxicity in rats. *Han'Guk Yongyang Siklyong Hakhoechi* (1994) 23(4): 574-80.
- FL** Cho, Soo-Yeul, Kim, Myung-Joo, and Lee, Mi-Kyung. the effect of zinc levels on free radical generating system in cadmium treated rats. *Han'Guk Yongyang Siklyong Hakhoechi* (1994) 23(5): 725-30 .
- FL** CHO, T. H. and CHA, Y. H. basic studies on the effects of rodenticides. *RES REP OFF RURAL DEV (VET) (SUWON)*; 14 1971 (RECD 1972) 75-89
- Alt** Choe, Won-Kyung and Rhee, soon-Jae. effects of zinc on the antioxidative enzymic system and metallothionein synthesis in streptozotocin-induced diabetic rats. *Han'Guk Sikip'Um Yongyang Kwahak Hoechi* (1997) 26(2): 344-350.
- Drug** Chohayeb, A. A., Adrian, J. C., and Salamat, K. 1991. pulpal response to tricalcium phosphate as a capping agent. *Oral Surgery, Oral Medicine, and Oral Pathology* 71(3): 343-5.
- Unrel** Choi, J. H. 1985. growth promoting effect of zn-bacitracin on growing-finishing swine. *Nutrition Reports International* 32(6): 1421-1424.
- No COC** Choi, J. H. and Ryu, K. S. 1987. responses of broilers to dietary zinc bacitracin at two different planes of nutrition. *British Poultry Science* 28(1): 113-8.
- FL** Choi, Mi-Kyeong and Jun, Ye-Sook. effect of copper supplementation on mineral utilizations in rats. *Han'Guk Sikip'Um Yongyang Kwahak Hoechi* (1999) 28(5): 1124-1130 .
- Nut** Choi, Mi-Kyeong and Sung, Chung-Ja. ca, mg and zn utilization in rats with different ages. *Han'Guk Sikip'Um Yongyang Kwahak Hoechi* (1998) 27(5): 928-934.
- BioX** Chong, B. S., Ford, T. R., and Kariyawasam, S. P. 1997. tissue response to potential root-end filling materials in infected root canals. *International Endodontic Journal* 30(2): 102-14.
- Unrel** Chong, B. S., Ford, T. R., and Wilson, R. F. 1997. radiological assessment of the effects of potential root-end filling materials on healing after endodontic surgery. *Endodontics & Dental*

Traumatology 13(4): 176-9.

- BioX** Chong, B. S., Pitt Ford, T. R., and Kariyawasam, S. P. 1997. short-term tissue response to potential root-end filling materials in infected root canals. *International Endodontic Journal* 30(4): 240-9.
- No Oral** Chongpraditnun, Praphasri, Suzuki, Keiji, Kawaharada, Umeko, Nakajima, Katsuyuki, and Chino, Mitsuo. 1991. immunohistochemical localization of metallothionein in plant tissues. *Water Air, Soil Pollut.* 57-58: 545-53.
- No COC** Chopra, G. X. 1992. poultry farms. *Rodents in Indian Agriculture.* 1: 309-330.
- IMM** Chopra, R. K., Sehgal, S., and Nath, R. 1984. cadmium an inhibitor of lymphocyte-transformation and stimulator of antibody-dependent cell-mediated cyto-toxicity (adcc) in rats - the role of zinc. *Toxicology* 33(3-4): 303-310.
- FL** Chotinski, D., Isvetanov, I., and Stanchev, Kh. 1985. comparative studies on antibiotics in mixed feeds for broiler chickens. *Zhivotnov'Dni Nauki* 22(6): 28-34.
- FL** Chotinski, D., Tsvetanov, I., and Stanchev, K. comparative studies on antibiotics in compound feeds at feeding broiler chickens. *ZHIVOTNOVD NAUKI. Zhivotnov'Dni Nauki.* 22 (6). 1985. 28-34.
- BioX** Chou HsinYiu, Peng TsuiYi, Chang SuJung, Hsu YaLi, Wu JenLeih, <Editors> Hill, B. J., Dixon, P., and Stone, D. 1999. effect of heavy metal stressors and salinity shock on the susceptibility of grouper (*epinephelus* sp.) to infectious pancreatic necrosis virus. *Virus Research* 63(1/2): 121-129.
- Nut def** Choudhary, D. effects of dietary zinc deficiency on mice testes - a biochemical study. *Trace Elem. Electrolytes* (1994) 11(3): 112-20.
- Nut def** Choudhary, D. some biochemical aspects of epididymides of zinc-deficient mice. *Trace Elem. Electrolytes* (1995) 12(1): 36-46.
- CP** Choudhury, H. 1974. adrenal-gonadal relationships to dietary zinc and copper in male rats. *Federation Proceedings* 33: 704.
- Alt** Choudhury, H., Srivastava, L., Murthy, L., O'Flaherty, E., and Petering, H. 1974. effects of castration and adrenalectomy on serum zinc and copper. *Proc. Asia Oceania Congr. Endocrinol.* 5th 1: 216-21. Editor(s): Rastogi, G. K. Publisher: Endocr. Soc. India, Chandigarh, India..
- No COC** Choudhury, H., Srivastava, L., Murthy, L., and Petering, H. 1975. effects of sex-hormones on growth, serum-lipids, zinc and copper in male and female rats. *Poultry Science* 54: 1746-1747.
- Alt** Chow Jesse C, Murray James D, Pomp Daniel, Baldwin Ransom L, Calvert Christopher C, and Oberbauer Anita M(A). 1994. regulation of insulin-like growth factor-i and binding protein-3 expression in omtla-ogh transgenic mice. *Transgenic Research* 3(2): 127-133.
- In Vit** Chow, P. H(A), Chan, C. W., and Cheng, L. Y. L. 1993. contents of fructose, citric acid, acid phosphatase, proteins and electrolytes in secretions of the accessory sex glands of the male golden hamster. *International Journal of Andrology* 16(1): 41-45.
- IMM** Chowdhury, B. A. and Chandra, R. K. 1989. effect of zinc administration on cadmium-induced suppression of natural killer cell activity in mice. *Immunology Letters* 22(4): 287-91.

- Drug** Chowdhury, B. A., Friel, J. K., and Chandra, R. K. 1987. cadmium-induced immunopathology is prevented by zinc administration in mice. *The Journal Of Nutrition*. 117(10): 1788-1794.
- IMM** Chowdhury, Badrul Alam and Chandra, Ranjit Kumar. effect of zinc administration on cadmium-induced suppression of natural killer cell activity in mice. *Immunol. Lett. (1989)* 22(4): 287-91.
- FL** Christ, J. F. and Bak, I. J. 1970. some finestructural observations on the small vesicular components in the posterior pituitary nerve fibres of rabbit. *Zeitschrift Fur Mikroskopisch-Anatomische Forschung* 81(3): 329-44.
- Nut def** Christensen, C. M., Caldwell, D. F., and Oberleas, D. 1974. establishment of a learned preference for a zinc-containing solution by zinc-deficient rats. *Journal of Comparative and Physiological Psychology* 87(3): 415-21.
- Nut def** Christensen, Carol M., Caldwell, Donald F., and Oberleas, Donald. establishment of a learned preference for a zinc-containing solution by zinc-deficient rats. *J. Comp. Physiol. Psychol. (1974)* 87(3): 415-21.
- In Vit** Christensen, J., Rick, G. A., and Soll, D. J. 1987. intramural nerves and interstitial cells revealed by the champy-maillet stain in the opossum esophagus. *Journal of the Autonomic Nervous System* 19(2): 137-51.
- Soil** CHRISTIE, P. and BEATTIE, J. AM. grassland soil microbial biomass and accumulation of potentially toxic metals from long-terms slurry application. *J APPL ECOL*; 26 (2). 1989. 597-612.
- Chem Meth** Chronoeos, Z. C., Baynes, J. W., and Thorpe, S. R. 1995. identification of liver endothelial cells as the primary site of igm catabolism in the rat. *Archives of Biochemistry and Biophysics* 319(1): 63-73.
- Nut def** Chu, Richard C., Schlicker, Sandra A., and Cox, Dennis H. zinc-biotin interrelationship in the rat. *Nutr. Rep. Int. (1970)* 1(1): 11-18.
- Diss** Chu, Richard C. C. 1970. excess dietary zinc during gestation or lactation and mineral composition and enzyme activity in tissues of the fetal, postnatal, and maternal rat. Avail.: Univ. Microfilms. Ann Arbor, Mich., Order No. 71-16,584 From: Diss. Abstr. Int. B 1971, 121 pp.
- FL** Chubukov, A. 1977. effect of zn on the activity of intestinal enzymes. *Svinovodstvo, Moscow, USSR* (10): 41.
- FL** Chubukov, A. and Tyurin, A. 1974. zinc in feeds and the body of animals. *Svinovodstvo, Moscow, USSR* (5): 25.
- FL** Chubukov, A. S. 1974. effect of iron, copper, zinc and cobalt on the mineral composition of sows' milk and growth of piglets. *Mikroelementy v Sibiri* (9): 133-136, 179.
- FL** Chueca, A., Garcia del Amo, C., and Santos-Ruiz, A. interference of cd++ on the turnover of zinc orally administered. *Rev. Espan. Fisiol. (1971)* 27(2): 143-8.
- Nut def** Chui, Li, Takagi, Yoji, Wasa, Masafumi, Loboshi, Yasuhiko, Inoue, Masahiro, Khan, Jesmine, Sando, Kinya, Nezu, Riichiro, and Okada, Akira. zinc deficiency enhances interleukin-1.alpha.-induced metallothionein-1 expression in rats. *J. Nutr. (1998)* 128(7): 1092-1098.

- No COC** Chun, Eui Chul. experimental studies of gelatin on insulin secretion of the rabbit. *Ch'Oesin Uihak* (1971) 14(1): 55-69 .
- Fate** Chun, Ki-Jung and Kim, Bong-Hee. 1996. changes of heavy metal concentration in rat 's tissues and urine after cd-administration. *Yakhak Hoechi* 40(5): 501-506.
- Gene** Chun, S. Y., McGee, E. A., Hsu, S. Y., Minami, S., LaPolt, P. S., Yao, H. H., Bahr, J. M., Gougeon, A., Schomberg, D. W., and Hsueh, A. J. 1999. restricted expression of wt1 messenger ribonucleic acid in immature ovarian follicles: uniformity in mammalian and avian species and maintenance during reproductive senescence. *Biology of Reproduction* 60(2): 365-73.
- CP** Chung, K., Howell, B., Norton, T., and Ringer, D. role of zinc copper and cadmium in the regulation of aryl sulfotransferase iv activity in rat liver. *75TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ATLANTA, GEORGIA, USA, APRIL 21-25, 1991. FASEB (FED AM SOC EXP BIOL) J.* 5 (4). 1991. A876.
- Mix** Chung, K., Romero, N., Tinker, D., Keen, C. L., Amemiya, K., and Rucker, R. 1988. role of copper in the regulation and accumulation of superoxide dismutase and metallothionein in rat liver. *Journal of Nutrition* 118(7): 859-64.
- Abstract** CHUNG, K., ROMERO, N., TINKER, D., and RUCKER, R. 1987. effect of cadmium and zinc on copper distribution and superoxide dismutase activity in liver and lung. *71ST ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY*
- FL** Chung, K. H. Samyuk Junior Agricultural Coll. Seoul Korea R., Kang, M. H. K Orea Univ. Seoul Korea R. Coll. of Agriculture, and Han, I. K. Seoul National Univ. Suweon Korea R. Coll of Agriculture. 1983. the toxicity of hexavalent chromium and its interaction with copper and zinc in chicks. *Korean Journal of Animal Sciences.* V. 25(6) P. 692-696
- FL** Chung, K. H. Samyuk Junior Agricultural Coll. Seoul Korea R., Kang, M. H. Korea Univ. Seoul Korea R. Coll. of Agriculture, and Kim, C. S. Korea Advanced Inst. and Tech. Seoul Korea R. 1983. the toxicity of trivalent chromium and its interaction with cobalt and zinc in chicks. *Korean Journal of Animal Sciences.* 25(6): 686-691.
- CP** Chung, K. W. and Om, A. S. 1995. effects of zinc-deficient diet on androgen metabolism and androgen receptors in the rat liver. *FASEB Journal* 9(3): A543.
- No Oral** Chung, Keun, Romero, Nadia, Tinker, Don, Keen, Carl L., Amemiya, Kenjie, and Rucker, Robert. role of copper in the regulation and accumulation of superoxide dismutase and metallothionein in rat liver. *J. Nutr.* (1988) 118(7): 859-64.
- FL** Chung, Keun H., Kang, Myun H., Han, In K., and Kim, Chun S. 1984. the effect of copper and zinc on chromium toxicity in chicks. *Hanguk Ch'Uksan Hakhoe Chi* 26(2): 177-80.
- FL** Chung, Keun H., Kang, Myun H., Han, In K., and Kim, Chun S. 1984. the toxicity of chromium and its interaction with silver, copper and zinc in the chicks. *Hanguk Ch'Uksan Hakhoe Chi* 26(2): 172-6 .
- Nut def** Chung, Kyung Won, Kim, Sook Young, Chan, Wai Yee, and Rennert, Owen M. androgen receptors in ventral prostate glands of zinc deficient rats. *Life Sci.* (1986) 38(4): 351-6
- FL** Chung, M. I. and Chung, Y. J. 1989. effect of different dietary zinc and protein levels on lipidmetabolism. *Korean Journal of Nutrition* 22(1): 9-22.

- No Oral** Chung, S. H. and Johnson, M. S. 1984. studies on sound-induced epilepsy in mice. *Proceedings of the Royal Society of London* 221(1223): 145-68.
- FL** Chung, W. T(A), Shin, H. T., and Lee, S. C(A). 1997. effects of zinc sources on characteristics of the rumen fermentation, milk production and availability by dairy cattle: i. the effects of zinc sources on fermentation characteristics in the rumen and duodenum of dairy cattle. *Korean Journal of Animal Nutrition & Feedstuffs* 21(1): 93-104.
- BioX** Chung, Y. S., Ha, J. K., and Lee, S. S. Seoul National University Suwon Korea Republic College of Agriculture and Life Science. 1993. effects of zinc ion on the ruminal microbial population, proteolytic enzyme activities and feed protein degradation. *Korean Journal of Dairy Science*. V. 15(4) P. 240-250
- Mix** Chung, Young Cho and Cha, Chul Whan. effects of iron and zinc on lead poisoning of rats in relation to .delta.-aminolevulinate dehydratase and hemoglobin contents. *Koryo Taehakkyo Uikwa Taehak Chapchi* (1982) 19(1): 135-41 .
- Drug** Church, Michael W., Jen, K. L. Catherine, Pellizzon, Michael A., and Holmes, Pamela A. 1998. prenatal cocaine, alcohol, and undernutrition differentially alter mineral and protein content in fetal rats. *Pharmacol. Biochem. Behav.* 59(3): 577-584.
- CP** Chvapil, M. and Misiorowski, R. 1980. in vivo inhibition of lysyl oxidase by high dose of zinc. *Proceedings of the Society for Experimental Biology and Medicine*; 164
- No COC** Chvapil, M., Misiorowski, R., and Eskelson, C. the mechanisms of beta amino propionitrile toxicity. *Journal of Surgical Research*. 31 (2). 1981. 151-155.
- Drug** Chvapil, M., Misiorowski, R., and Eskelson, C. 1981. on the mechanisms of beta-aminopropionitrile toxicity. *Journal of Surgical Research* 31(2): 151-5.
- Nut def** Chvapil, M., Peng, Y. M., Aronson, A. L., and Zukoski, C. 1974. effect of zinc on lipid peroxidation and metal content in some tissues of rats. *Journal of Nutrition* 104(4): 434-443.
- No COC** Chvapil, M., Ryan, J. N., Elias, S. L., and Peng, Y. M. protective effect of zinc on carbon tetra chloride induced liver injury in rats. *Experimental and Molecular Pathology*. 19 (2). 1973 186-196.
- Nut def** Chvapil, M., Stankova, L., Bartos, Z., Cox, T., and Nichols, W. mobility of peritoneal inflammatory cells after in-vivo supplementation with zinc. *Res Journal of the Reticuloendothelial Society*. 25 (4). 1979. 345-350.
- Alt** Chvapil, Milos and Misiorowski, Ronald. 1980. in vivo inhibition of lysyl oxidase by high dose of zinc. *Proc. Soc. Exp. Biol. Med.* 164(2): 137-41 .
- Bio Acc** Chvapil, Milos, Peng, Yei Mei, and Aronson, Arthur L. effect of zinc on lipid peroxidation and metal content in some tissues of rats. *J. Nutr.* (1974) 104(4): 434-43.
- Org Met** Ciampolini, M., Suss, L., Zerbi, N., and Penna, E. 1985. voles cause severe damage to the citrus orchards of calabria. *Informatore Agrario* 41(11): 93-99.
- No COC** Cianciaruso, B., Jones, M. R., and Kopple, J. D. 1981. histidine, an essential amino acid for adult dogs. *Journal of Nutrition* 111(6): 1074-84.
- Nut def** Cianciaruso, Bruno, Jones, Michael R., and Kopple, Joel D. histidine, an essential amino acid for adult dogs. *J. Nutr.* (1981) 111(6): 1074-84.

Nut def	Cianfarani S(A), Germani D(A), Rossi, L., Puglianiello A(A), Migliaccio, S. A, and Branca, F. 1998. effect of dietary zinc deficiency on growth, bone metabolism, igf-i, igfbp-3 and insulin in rats. <i>Hormone Research (Basel)</i> 50(SUPPL. 3): 44.
Carcin	Ciapparelli, L., Retief, D. H., and Fatti, L. P. effect of zinc on 9,10-dimethyl-1,2-benzanthracene (dmba)-induced salivary gland tumors in the albino rat. <i>S. Afr. J. Med. Sci. (1972)</i> 37(3-4): 85-90 .
In Vit	Cichocki, Tadeusz, Gonsior, Bernhard, Hofert, Manfred, Jarczyk, Lucjan, Raith, Burkhard, Rokita, Eugenius, Strzalkowski, Adam, and Sych, Marek. the analysis of mineral deposits and proteoglycans content in the cartilage of mouse trachea using pixe in combination with proton microprobe. <i>Acta Histochem. (1989)</i> 85(1): 39-45 .
No COC	Cier, D., Rimsky, I., Rand, N., Polishuk, O., and Frish, Y. 1992. the effects of pellets, mash, high protein and antibiotics on the performance of broiler breeder hens in a hot climate. 111-112.
Nut def	Cigankova, V., Mesaros, P., Bires, J., Tomajkova, E., and Cernota, S. 1994. morphological structure of the testes of bulls with zinc deficiency and the effect of administering zindep inj. on the recovery of spermatogenesis. <i>Slovensky Veterinarsky Casopis</i> 19(3): 134-138.
Gene	Cihak, Alois, Mesa, Milagros Carcia, and Inoue, Hideo. depression of dna synthesis in the thymus of zinc-treated adult mice. <i>Collect. Czech. Chem. Commun. (1983)</i> 48(10): 3020-3 .
Mix	Cikrt, M., Tichy, M., and Holusa, R. biliary excretion of copper-64, zinc-65, and mercury-203 in the rat with liver injury induced by carbon tetrachloride. <i>Arch. Toxicol. (1975)</i> 34(3): 227-36 .
Mix	Cikrt, Miroslav, Tichy, Milon, and Holusa, Radim. elimination of copper-64, zinc-65, and mercury-203 in the bile of rats with liver damage caused by d,l-ethionine. <i>Prac. Lek. (1981)</i> 33(6-7): 208-11 .
Org Met	CINCOTTA, R. P., URESK, D. W., And HANSEN, R. M. demography of black-tailed prairie dog populations reoccupying sites treated with rodenticide. <i>GREAT BASIN NAT; 47 (2). 1987.</i> 339-343.
No COC	Cincotta, R. P. Uresk D. W. and Hansen R. M. 1987. demography of black-tailed prairie dog populations reoccupying sites treated with rodenticide. <i>Great Basin Nat.</i> 47(2): 339-343.
No Oral	Clarkson, J. P., Elmes, M. E., Jasani, B., and Webb, M. 1985. histological demonstration of immunoreactive zinc metallothionein in liver and ileum of rat and man. <i>Histochemical Journal</i> 17(3): 343-52.
CP	Clarkson, Johanna P., Elmes, Margaret E., Jasani, B., and Webb, M. 1985. histological demonstration of immunoreactivity to zinc metallothionein in rat tissues. <i>Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th</i> : Meeting Date 1984, 392-4. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK..
Alt	Clegg, M. S., Ferrell, F., and Keen, C. L. 1987. hypertension-induced alterations in copper and zinc metabolism in dahl rats. <i>Hypertension</i> 9(6): 624-8.
CP	Clegg, M. S(A), Donovan, S. M., Golub, M. S., Gershwin, M. E., and Keen, C. L. 1994. primates consuming marginal zinc diets have altered serum insulin like growth factor binding (igfbp) profiles. <i>FASEB Journal</i> 8(4-5): A716.
Nut def	Clegg Michael S, Donovan Sharon M, and Keen Carl L. 1993. zinc deficiency and igf binding

protein metabolism in the rat. *FASEB Journal* 7(3-4): A736.

- Alt** Clegg, Michael S., Ferrell, Fay, and Keen, Carl L. hypertension-induced alterations in copper and zinc metabolism in dahl rats. *Hypertension (Dallas) (1987)* 9(6): 624-8.
- Nut def** Clejan, S., Castro-Magana, M., Collipp, P. J., Jonas, E., and Maddaiah, V. T. 1982. effects of zinc deficiency and castration on fatty acid composition and desaturation in rats (polyunsaturated fatty acid deficiency, serum hypertriglyceridemia). *Lipids*. 17 (3): 129-135.
- Nut def** Clejan, Sanda, Castro-Magana, Mariano, Collipp, Platon J., Jonas, Ernesto, and Maddaiah, Vaddanahally T. effects of zinc deficiency and castration on fatty acid composition and desaturation in rats. *Lipids (1982)* 17(3): 129-35.
- Nut def** Clejan, Sanda, Maddaiah, V. T., Castro-Magana, M., and Collipp, P. J. zinc deficiency-induced changes in the composition of microsomal membranes and in the enzymic regulation of glycerolipid synthesis. *Lipids (1981)* 16(6): 454-60.
- HHE** Clough, S. R., Mitra, R. S., and Kulkarni, A. P. 1986. qualitative and quantitative aspects of human fetal liver metallothioneins. *Biology of the Neonate* 49(5): 241-54.
- In Vit** Coakley, M. E. and Brown, N. A. 1986. valproic acid teratogenicity in whole embryo culture is not prevented by zinc supplementation. *Biochemical Pharmacology* 35(6): 1052-1055.
- In Vit** Coakley, Mary E. and Brown, Nigel A. valproic acid teratogenicity in whole embryo culture is not prevented by zinc supplementation. *Biochem. Pharmacol. (1986)* 35(6): 1052-5.
- No COC** Coates, M. E. and Harrison, G. F. 1969. observations on the growth-promoting effects of procaine penicillin and zinc bacitracin on chicks in different environments. *Journal of the Science of Food and Agriculture* 20(3): 183-4.
- No COC** Cocco, D., Calabrese, L., Rigo, A., Marmocchi, F., and Rotilio, G. preparation of selectively metal-free and metal substituted derivatives by reaction of copper zinc super oxide dis mutase with di ethyl di thio carbamate. *Biochemical Journal*. 199 (3). 1981. 675-680.
- No Oral** Cocmen, Cemil, Kumcu, Eda Karabal, Secilmis, Ata, Ucar, Peyman, Dikmen, Atilla, and Baysal, Firuz. restorative effects of zinc and selenium on nitrenergic relaxations impaired by cadmium in the mouse corpus cavernosum. *Toxicol. Lett. (2000)* 111(3): 229-234.
- Unrel** Coffe Arnold(A), Cavailles Vincent, Knowles Phillip, and Pappin Darryl. 1996 . biochemical characterization and novel isolation of pure estrogen receptor hormone-binding domain. *Journal of Steroid Biochemistry and Molecular Biology* 58(5-6): 467-477.
- Bact** Coghlan, L. G., Carlomagno, M. A., and McMurray, D. N. 1988. effect of protein and zinc deficiencies on vaccine efficacy in guinea pigs following pulmonary infection with listeria. *Medical Microbiology and Immunology* 177(5): 255-63.
- Nut def** Coghlan, Lezlee Graham, Carlomagno, Mirta A., and McMurray, David N. effect of protein and zinc deficiencies on vaccine efficacy in guinea pigs following pulmonary infection with listeria. *Med. Microbiol. Immunol. (1988)* 177(5): 255-63.
- Nut def** Cohen, N. L., Keen, C. L., Lonnerdal, B., and Hurley, L. S. 1983. the effect of copper supplementation on the teratogenic effects of triethylenetetramine in rats. *Drug-Nutrient Interactions* 2(3): 203-10.
- CP** Cohen Paul(A), Prat Annik(A), Foulon Thierry(A), Chesneau Valerie(A), Pierotti Adrian(A),

- Cadel Sandrine(A), and Segretain Dominique. 1995. structure, functional properties, tissular and sub-cellular localization of two novel metallopeptidases exhibiting a specificity for basic residues. *Journal of Cellular Biochemistry Supplement* 0(19B): 236.
- Nut** Cohen, R. D. H., Iwaasa, A. D., Mann, M. E., Coxworth, E., and Kernan, J. A. 1989. studies on the feeding value of kochia scoparia (l.) schrad. hay for beef cattle. *Canadian Journal of Animal Science* 69(3): 735-743.
- Mineral** Coldwell, Susan E. and Tordoff, Michael G. acceptance of minerals and other compounds by calcium-deprived rats : 24-h tests. *Am. J. Physiol.* (1996) 271(1, Pt. 2): R1-R10.
- Nut def** Cole, A. C(A), Beverly, J. L., and Shay, N. F. 1999. 2-deoxy-d-glucose induced feeding during the initiation of zinc deficiency. *FASEB Journal* 13(4 PART 1): A571.
- Prim** Cole, M. F. and Bowen, W. H. 1975. effect of sodium phytate on the chemical and microbial composition of dental plaque in the monkey (macaca fascicularis). *Journal of Dental Research* 54(3): 449-57.
- No Oral** Cole, N. A. 1995. influence of a three-day feed and water deprivation period on gut fill, tissue weights, and tissue composition in mature wethers. *Journal of Animal Science* 73(9): 2548-2557.
- No COC** Cole, N. A. 1996. metabolic changes and nutrient repletion in lambs provided with electrolyte solutions before and after feed and water deprivation. *Journal of Animal Science* 74(2): 287-294.
- Abstract** Coleman, B. W., Reimann, E. M., Grummer, R. H., and Hoekstra, W. G. antagonistic effect of dietary arginine on zinc deficiency in chicks abstract leg abnormalities feather defects. *FED PROC. Federation Proceedings.* 28 (2). 1969 761
- Nut def** Coleman, B. W., Reimann, E. M., Grummer, R. H., Sunde, M. L., and Hoekstra, W. G. 1971. antagonistic effect of arginine on zinc metabolism in chicks. *Journal of Nutrition* 101(12): 1695-702.
- No Oral** Coleman, C. B. and Matrone, G. in-vivo effect of zinc on iron induced ferritin synthesis in rat liver dietary zinc toxicity. *Biochimica Et Biophysica Acta.* 177 (1). 1969 106-112.
- Mix** Coleman, Cynthia B. and Matrone, Gennard. in vivo effect of zinc on iron-induced ferritin synthesis in rat liver. *Biochim. Biophys. Acta* (1969) 177(1): 106-12 .
- Phys** Coleman, G. J. and Hay, M. anticipatory wheel-running in behaviorally anosmic rats. *Physiology & Behavior.* 47 (6). 1990. 1145-1152.
- CP** Colige Alain, Li Shi-Wu, Sieron Aleksander L, Nusgens Betty V, Prockop Darwin J(A), and Lapierre Charles M. 1997. cDNA cloning and expression of bovine procollagen I n-proteinase: a new member of the superfamily of zinc-metalloproteinases with binding sites for cells and other matrix components. *Proceedings of the National Academy of Sciences of the United States of America* 94(6): 2374-2379.
- FL** Colin Alvarez Leonardo(A), Morales Barrera Eduardo, and Avila Gonzalez= Ernesto. 1994. evaluation of growth promoters in broiler chicks. *Veterinaria - Mexico* 25(2): 141-144.
- HHE** Colin, M. A., Taper, L. J., and Ritchey, S. J. 1983. effect of dietary zinc and protein-levels on the utilization of zinc and copper by adult females. *Journal Of Nutrition* 113(8): 1480-1488.

- No COC** Collings, G. F., Erickson, J. P., Yokoyama, M. T., and Miller, E. R. effect of wheat middlings on fiber digestibility, serum cholesterolglucose and fecal bile acids in pigs.
- Nut** Collins, N. E. and Moran, E. T. Jr. 1999. influence of supplemental manganese and zinc on live performance and carcass quality of diverse broiler strains. *J. Appl. Poult. Res.* 8(2): 228-235 .
- Unrel** Collipp, P. J., Kris, V. K., Castro-Magana, M., Shih, A., Chen, S. Y., Antoszyk, N., Baltzell, Jan, Noll, Jamie, and Trusty, Cheryl. the effects of dietary zinc deficiency on voluntary alcohol drinking in rats. *Alcohol.: Clin. Exp. Res.* (1984) 8(6): 556-9
- Unrel** Collipp, P. J., Kris, V. K., Castromagana, M., Shih, A., Chen, S. Y., Antoszyk, N., Baltzell, J., Noll, J., and Trusty, C. 1984. the effects of dietary zinc-deficiency on voluntary alcohol drinking in rats. *Alcoholism-Clinical And Experimental Research* 8(6): 556-559.
- HHE** Collipp, P. J., Kuo, B., Castromagana, M., Chen, S. Y., and Salvatore, S. 1983. hair zinc levels in infants. *Clinical Pediatrics* 22(7): 512-513.
- Rev** Colombini, S. and Dunstan, R. W. 1997. zinc-responsive dermatosis in northern-breed dogs: 17 cases (1990-1996). *Journal of the American Veterinary Medical Association* 211(4): 451-3.
- Yeast** Colome, H., Cabrera, J. F., Sardinas, J. M., Mayari, R., Zaldivar, V., Labrada, I., Ortiz, F., Manzanares, D., Alvarez, E., and Peraza, M. experimental reproduction of metabolic disorders in pigs caused by consumption of protein molasses. *Revista De Salud Animal.* 10 (3). 1988. 217-227.
- Nut** Colome, H., Cabrera, J. F., Sardinas, J. M., Mayari, R., Zaldivar, V., Labrada, I., Ortiz, F., Manzanares, D., Alvarez, E., and Peraza, M. 1988. experimental reproduction of metabolic changes in pigs fed proteinmolasses. *Revista De Salud Animal* 10(3): 217-227.
- No Tox** Colome, H., Mayari, R., Cabrera, J. F., Sardinas, J., Manzanares, D., Zaldivar, V., Peraza, M., and Ortiz, F. blood biochemical indicators in pigs fed molasses and torula yeast. *Revista De Salud Animal.* 9 (3). 1987. 241-246.
- Nut def** Colome, H. and Torroella, E. 1985. relation between plasma and liver vitamin a values and the prevalence of pneumonia in calves. *Revista De Salud Animal* 7(2): 163-168.
- FL** Colome, H. and Torroella, E. relationship between plasma and liver levels of vitamin a and prevalence of calf pneumonia. *Revista De Salud Animal.* 7 (2). 1985. 163-168.
- Gene** Cols, N., Romero-Isart, N., Capdevila, M., Oliva, B., Gonzalez-Duarte, P., Gonzalez-Duarte, R., and Atrian, S. 1997. binding of excess cadmium(ii) to cd7-metallothionein from recombinant mouse zn7-metallothionein 1. uv-vis absorption and circular dichroism studies and theoretical location approach by surface accessibility analysis. *Journal of Inorganic Biochemistry* 68(3): 157-66.
- Nut def** Colville, Jean Gratzek and Johnson, Mary Ann. prior exposure to copper, but not iron, decreases the severity of copper deficiency in growing rats. *Magnesium Trace Elem.* (1992) Volume Date 1991, 10(1): 21-9.
- Org Met** Colvin, B. A., Hegdal, P. L., and Jackson, W. B. review of non-target hazards associated with rodenticide use in the usa. *EUROPEAN AND MEDITERRANEAN PLANT PROTECTION ORGANIZATION CONFERENCE ON RODENTS, ROME, ITALY, SEPTEMBER 7-11, 1987. BULL OEPP (ORGAN EUR MED PROT PLAN).* 18 (2). 1988. 301-308.
- In Vit** Colvin, Robert A. characterization of a plasma membrane zinc transporter in rat brain. *Neurosci.*

Lett. (1998) 247(2,3): 147-150.

- CP** Combs, D. K., Meiske, J. C., and Goodrich, R. D. influence of dietary zinc on hair and tissue zinc concentrations in rats. *MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE, SOUTHERN SECTION, ATLANTA, GA., USA, FEB. 1-4, 1981. J ANIM SCI. 53 (Suppl. 1). 1981 (Recd. 1982). 90.*
- Bio Acc** Combs, D. K. JANSAN, Goodrich, R. D., and Meiske, J. C. 1983. influence of dietary zinc or cadmium on hair and tissue mineral concentrations in rats and goats. *Journal of Animal Science.* 56 (1): 184-193.
- Mix** Combs, G. F., Su, Q., Liu, C. H., and Combs, S. B. 1986. effects of dietary selenite, copper, and zinc on tissue trace mineral levels in chicks. *Biological Trace Element Research 1986, V11, Dec, P51-64*
- Nut def** Combs, G. F. Jr., Su, Q., Liu, C. H., and Combs, S. B. effects of dietary selenite, copper, and zinc on tissue trace mineral levels in chicks. *Biol. Trace Elem. Res. (1986) : 11, 51-64 .*
- Nut** Comprau, K., Lopez, P. L., Chavez, M. A. , and Ricohermoso, E. J. zinc metabolism in broilers. *Philipp. J. Vet. Anim. Sci. (1977) 3(1-2): 26-33 .*
- Unrel** Compton, M. M. 1991. development of an apoptosis endonuclease assay. *DNA and Cell Biology* 10(2): 133-41.
- Fate** Conde Moreira, O. M. S. 1991. study on zinc supplementation in a basal diet for ruminants. *World Review of Animal Production* 26(1): 77-80, 7.
- No Oral** Conner M.W., Flood W.H., Rogers A.E., and Amdur M.O. 1988. lung injury in guinea pigs caused by multiple exposures to ultrafine zinc oxide: changes in pulmonary lavage fluid. *J. TOXICOL. ENVIRON. HEALTH* VOL. 25, NO. 1: pp. 57-69.
- No Oral** Connolly, K. M., Stecher, V. J., and Kent, L. 1988. examination of interleukin-1 activity, the acute phase response, and leukocyte subpopulations in rats with adjuvant-induced arthritis. *Journal of Laboratory and Clinical Medicine* 111(3): 341-7.
- Nut def** Connors, T. J., Czarnecki, D. B., and Haskett, M. I. 1983. acquired zinc-deficiency in a breast-fed premature-infant. *Archives Of Dermatology* 119(4): 319-321.
- FL** Conseil, A. H. 1992. [mineral feeding of dairy cow. survey results (france)]. <original> alimentation minerale de la vache laitiere. resultat d'une enquete dans quatre cooperatives [france]. 117 P.
- No COC** Cook, B. and Hunter, R. H. F. systemic and local hormonal requirements for implantation in domestic animals. *Journal of Reproduction and Fertility.* 54 (2). 1978 471-482
- CP** Cook, M., Gould, A., Brand, N., Davies, J., Strutt, P., Shaknovich, R., Licht, J., Waxman, S., Chen, Z., Gluecksohn-Waelsch, S., Krumlauf, R., and Zelent, A. 1995. expression of the zinc-finger gene *plzf* at rhombomere boundaries in the vertebrate hindbrain. *Proceedings of the National Academy of Sciences of the United States of America* 92(6): 2249-2253.
- Nut def** Cook, M. E., Sunde, M. L., Stahl, J. L., and Hanson, L. E. 1984. zinc deficiency in pheasant chicks fed practical diets. *Avian Diseases* 28(4): 1102-1109.
- Nut def** Cook-Mills, Joan M. and Fraker, Pamela J. functional capacity of the residual lymphocytes from zinc-deficient adult mice. *Br. J. Nutr. (1993) 69(3): 835-48.*

- Bio Acc** Cooke, J. A., Andrews, S. M., and Johnson, M. S. 1990. the accumulation of lead, zinc, cadmium and fluoride in the wood mouse (*apodemus sylvaticus* l.). *Water Air, Soil Pollut.* 51(1-2): 55-63 .
- Unrel** Cooke, J. A. and Fontenot, J. P. 1990. utilization of phosphorus and certain other minerals from swine waste and broiler litter. *Journal of Animal Science* 68(9): 2852-63.
- No Oral** Cooper, A. and Hathorn, S. modification of flavor preference by olfactory pre exposure in normal and zinc sulfate treated mice. *Bulletin of the Psychonomic Society.* 10 (5). 1977 369-370.
- Nut** Cooper, D. A., Berry, D. A., Jones, M. B., Kiorpes, A. L., and Peters, J. C. 1997. olestra's effect on the status of vitamins a, d and e in the pig can beoffset by increasing dietary levels of these vitamins. *Journal of Nutrition* 127(8 SUP): 1589S-1608S.
- Nut** Cooper, D. A., Berry, D. A., Spendel, V. A., Jones, M. B., Kiorpes, A. L., and Peters, J. C. 1997. nutritional status of pigs fed olestra with and without increaseddietary levels of vitamins a and e in long-term studies. *Journal of Nutrition* 127(8Supp): 1609S-1635S.
- Nut** Cooper, D. A., Berry, D. A., Spendel, V. A., King, D., Kiorpes, A. L., and Peters, J. C. 1997. olestra dose response on fat-soluble and water-soluble nutrients in thepig. *Journal of Nutrition* 127(8 SUP): 1573S-1588S.
- Fate** Cooper, Helen K. preliminary studies on the differential removal of products formed in the dna of various rat organs after chronic administration of a low dose of zinc. *Toxicology (1985)* 34(3): 261-70 .
- Nut def** Cope, Frederick O., Sundaresan, P. R., and Smith, J. C. Jr. alterations in the kinetics of vitamin a-metabolizing enzymes in rat liver during zinc deficiency. *Proc. Pa. Acad. Sci. (1981)* 55(2): 183-6.
- Fate** Coppen, D. E. and Davies, N. T. 1987. studies on the effects of dietary zinc dose on 65zn absorption in vivo and on the effects of zn status on 65zn absorption and body loss in young rats. *The British Journal Of Nutrition.* 57(1): 35-44.
- In Vit** Coppen, D. E., Davies, N. T., and Mills, C. F. 1983. studies on the kinetics of dietary zinc-absorption in the rat. *Proceedings Of The Nutrition Society* 42: A127.
- In Vit** Coppen, D. E., Richardson, D. E., and Cousins, R. J. 1988. zinc suppression of free-radicals induced in cultures of rat hepatocytes by iron, trans-butyl hydroperoxide, and 3-methylindole. *Proceedings Of The Society For Experimental Biology And Medicine* 189(1): 100-109.
- Fungus** Corbel, M. J., Hambleton, P., Baskerville, A., and Bailey, N. E. 1983. biochemical and pathological changes in experimental phycomycosis(rabbit). *Journal of Comparative Pathology* 93(2): 219-234.
- Nut** Corbellini, C. N., Mangoni, A. R., Mattos, A. C. de, and Auzmendi, J. 1997. effects of supplementation of slightly deficient dairy cows with zincoxide or methionine-zinc. *Revista De Medicina Veterinaria (Buenos Aires)* 78(6): 439-447.
- Alt** Cordova, A. 1994. zinc content in selected tissues in streptozotocin-diabetic rats after maximal exercise. *Biological Trace Element Research.* 42(3): 209-216.
- Nut** Cordova, Alfredo, Navas, Francisco Jose, and Escanero, Jesus Fernando. the effect of exercise and zinc supplement on the hematological parameters in rats. *Biol. Trace Elem. Res. (1993)* 39(1): 13-20.

- HHE** Corman, L. C. 1985. the role of diet in animal models of systemic lupus erythematosus: possible implications for human lupus. *Seminars in Arthritis and Rheumatism* 15(1): 61-9.
- Nut def** Cornatzer, W. E., Haning, J. A., Wallwork, J. C., and Sandstead, H. H. 1984. effect of zinc deficiency on the biosynthesis of phosphatidylcholine in rat microsomes. *Biological Trace Element Research*. 6(5): 393-401.
- Nut def** Cornatzer, W. E., Haning, Judy A., Wallwork, James C., and Sandstead, Harold H. effect of zinc deficiency on the biosynthesis of phosphatidylcholine in rat microsomes. *Biol. Trace Elem. Res.* (1984) 6(5): 393-401.
- Nut def** Cossack, Z. T. 1988. effect of zinc level in the refeeding diet in previously starved rats on plasma somatomedin c levels. *Journal of Pediatric Gastroenterology and Nutrition* 7(3): 441-5.
- CP** Cossack, Z. T. plasma somatomedin c and zinc status as affected by interactions between varying levels of dietary protein fed in combinations with varying levels of zinc supplement. *BRAETTER, P. AND P. SCHRAMMEL (ED.). TRACE ELEMENT ANALYTICAL CHEMISTRY IN MEDICINE AND BIOLOGY, VOL. 3. 3RD INTERNATIONAL WORKSHOP, NEUHERBERG, WEST GERMANY, APR. 1984. XVI+761P. WALTER DE GRUYTER AND CO.: BERLIN, WEST GERMANY; NEW YORK, N.Y., USA. ILLUS. ISBN 3-11-009821-0. 0 (0). 1984 (Recd. 1985). 657-668.*
- Nut def** Cossack, Z. T. 1986. somatomedin-c and zinc status in rats as affected by zn, protein and food intake. *British Journal of Nutrition* 56(1): 163-9.
- FL** Cossack, Z. T. somatomedin-c in zinc deficiency. *Experientia* (1984) 40(5): 498-500
- Mix** Cossack, Z. T. and Hamer, C. J. A. van den. 1987. kinetics of copper absorption in zinc-overload states and following the withdrawal of zinc supplement: the role of endogenous zinc status. *Journal of Pediatric Gastroenterology and Nutrition* 6(2): 296-301.
- Nut def** Cossack, Z. T. and Prasad, A. S. 1987. hyperammonemia in zinc deficiency: activities of urea cycle relatedenzymes. *Nutrition Research* 7(11): 1161-1167.
- Nut def** Cossack, Z. T., Prasad, A. S., and Konoich, D. 1982. effect of zinc supplementation on retinal reductase in zinc deficient rats. *Nutrition Reports International* 26(5): 841-848.
- Nut def** Cossack, Zafrallah T. effect of zinc level in the refeeding diet in previously starved rats on plasma somatomedin c levels. *J. Pediatr. Gastroenterol. Nutr.* (1988) 7(3): 441-5 .
- CP** Cossack, Zafrallah T. 1984. plasma somatomedin-c and zinc status as affected by interactions between varying levels of dietary protein fed in combinations with varying levels of zinc supplement. *Trace Elem. Anal. Chem. Med. Biol. Proc. Int. Workshop, 3rd* : 657-67. Editor(s): Braetter, Peter; Schramel, Peter. Publisher: de Gruyter, Berlin, Fed. Rep. Ger..
- Nut def** Cossack, Zafrallah T. and Prasad, Ananada S. activities of purine catabolism related enzymes in zinc deficiency: relationship to t-lymphocyte dysfunction and hyperammonemia. *Int. J. Vitam. Nutr. Res.* (1991) 61(1): 51-6.
- Nut def** Cossack, Zafrallah T. and Prasad, Ananda S. hyperammonemia in zinc deficiency: activities of urea cycle related enzymes. *Nutr. Res. (N. Y.)* (1987) 7(11): 1161-7.
- Bio Acc** Cossack, Zafrallah T. and Van den Hamer, Cornelis J. A. 1987. kinetics of copper absorption in zinc-overload states and following the withdrawal of zinc supplement: the role of endogenous zinc status. *J. Pediatr. Gastroenterol. Nutr.* (1987) 6(2): 296-301 .

- Unrel** Costello, L. C. and Franklin, R. B. 1994. effect of prolactin on the prostate. *Prostate* 24(3): 162-6.
- Phys** Costello Leslie C(A), Franklin Renty B, Liu, Y., and Kennedy, M. Claire. 2000. zinc causes a shift toward citrate at equilibrium of the m-aconitase reaction of prostate mitochondria. *Journal of Inorganic Biochemistry* 78(2): 161-165.
- Unrel** Costello Leslie C(A), Liu Yiyan, Franklin Renty B, and Kennedy Mary Claire. 1997. zinc inhibition of mitochondrial aconitase and its importance in citrate metabolism of prostate epithelial cells. *Journal of Biological Chemistry* 272(46): 28875-28881.
- Unrel** Cotes, O., Boj, J. R., Canalda, C., and Carreras, M. 1997. pulpal tissue reaction to formocresol vs. ferric sulfate in pulpotomized rat teeth. *Journal of Clinical Pediatric Dentistry* 21(3): 247-53.
- Bact** Cotton, W. R. 1974. bacterial contamination as a factor in healing of pulp exposures. *Oral Surgery, Oral Medicine, and Oral Pathology* 38(3): 441-50.
- Nut def** Coudray, C., Boucher, F., Richard, M. J., Arnaud, J., Leiris, J. de, and Favier, A. 1991. zinc deficiency, ethanol, and myocardial ischemia affect lipoperoxidation in rats. *Biological Trace Element Research* 30(2): 103-118.
- Nut** Coudray, C., Bousset, C., Pepin, D., Tressol, J. C., Belanger, J., and Rayssiguier, Y. effect of acute ingestion of polyphenol compounds on zinc and copper absorption in the rat . utilisation of stable isotopes and icp/ms technique. *Eur. Comm. [Rep.] EUR*
- Nut def** Coudray, C., Charlon, V., de Leiris, J., and Favier, A. 1993. effect of zinc deficiency on lipid peroxidation status and infarct size in rat hearts. *International Journal of Cardiology* 41(2): 109-13.
- No COC** Coudray, Charles, Bousset, Carole, Tressol, Jean C., Pepin, Denise, and Rayssiguier, Yves. short-term ingestion of chlorogenic or caffeic acids decreases zinc but not copper absorption in rats , utilization of stable isotopes and inductively-coupled plasma mass spectrometry technique. *Br. J. Nutr. (1998)* 80(6): 575-584.
- CP** Coulter Douglas A(A) and Gibbs John W Iii. 1995. development of gaba-a receptor function in the rat thalamocortical system: zinc and zolpidem sensitivity of gabaergic responses in thalamic and cortical neurons. *Society for Neuroscience Abstracts* 21(1-3): 113.
- Nut def** Courdoughji, M. K., Guelfi, J. F., Grozdea, J. G., Brisson-Lougarre, A., Lamand, M., and Vergnes, H. A. 1991. characterization of neutrophil alkaline-phosphatase in lambs during dietary zinc deficiency. *Small Ruminant Research* 5(1, 2): 173-180.
- Nut def** Coursin, D. B. and Cihla, H. P. 1996. pulmonary effects of short term selenium deficiency. *Thorax* 51(5): 479-83.
- CP** Courtens, J. L., Ekwall, H., Paquignon, M., Nicolle, J. C., and Ploen, L. 1988. water and some element contents in boar spermatozoa, before, during and after freezing. an electron microscopy study using image analysis and x-ray microspectrophotometry. (Paper No. 234): 3pp.
- CP** Cousins, R. J. theoretical and practical aspects of zinc uptake and absorption. *THIRD CHEMICAL CONGRESS OF NORTH AMERICA HELD AT THE 195TH AMERICAN CHEMICAL SOCIETY MEETING, TORONTO, ONTARIO, CANADA, JUNE 5-10, 1988. ABSTR PAP CHEM CONGR NORTH AM.* 3 (1). 1988. Agfd 95.

- Rev** Cousins, R. J. 1986. toward a molecular understanding of zinc metabolism. *Clinical Physiology and Biochemistry* 4(1): 20-30.
- CP** Cousins, R. J. and Shay, N. F. 1993. regulation by dietary zinc for intestinal mrnas in pair- and meal-fed rats. *FASEB Journal* 7(3-4): A724.
- CP** Couzy, F., Guezennec, C. Y., and Lafargue, P. 1991. effect of excise on zinc status in the rat. *Trace Elem. Man Anim. 7: Monogr. Proc., Round Tables Discuss. Int. Symp., 7th* : Meeting Date 1990, 32-4-32/5. Editor(s): Momcilovic, Berislav. Publisher: Inst. Med. Res. Occup. Health Univ. Zagreb, Zagreb, Yugoslavia..
- BioX** Cowan, L. A., Barsanti, J. A., Brown, J., and Jain, A. 1991. effects of bacterial infection (escherichia coli) and castration onprostatic tissue zinc concentration in dogs. *American Journal of Veterinary Research* 52(8): 1262-1264.
- FL** Cowan, P. E. poison and bait shyness in 2 species of gerbil meriones-hurrianiae and tatera-indica. *Z ANGEW ZOOL. Zeitschrift Fuer Angewandte Zoologie.* 65 (1). 1978 57-68.
- Nut def** Cowen, L. A., Bell, D. E., Hoadley, J. E., and Cousins, R. J. 1986. influence of dietary zinc deficiency and parenteral zinc on rat liver fructose 1,6-bisphosphatase activity. *Biochemical And Biophysical Research Communications.* 134(2): 944-950.
- Abstract** Cowen, L. A. and Cousins, R. J. regulation of liver fructose 1 6 bis phosphatase activity by dietary zinc. *66TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, NEW ORLEANS, LA., USA, APRIL 15-23, 1982. FED PROC.* 41 (3). 1982. Abstract 99.
- Abstract** Cowen, L. A., Etzel, K. R., Mccormick, C. C., and Cousins, R. J. influence of zinc status on liver fructose 1 6 bis phosphatase ec-3.1.3.11 activity. *65TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ATLANTA, GA., USA, APRIL 12-17, 1981. FED PROC.* 40 (3 Part 2). 1981. 940.
- Diss** Cowen, Lisa Allyson. 1983. regulation of rat liver fructose 1,6-bisphosphatase activity by dietary zinc. *Avail.: Univ. Microfilms Int. Order No. DA8406357 From: Diss. Abstr. Int. B* 1984, 44. 12, Pt. 1. 102 pp.
- Unrel** Cox, C. F., Subay, R. K., Suzuki, S., Suzuki, S. H., and Ostro, E. 1996. biocompatibility of various dental materials: pulp healing with a surface seal. *International Journal of Periodontics & Restorative Dentistry* 16(3)
- Nut def** Cox, Dennis H., Chu, Richard C., and Schlicker, Sandra A. zinc deficiency in the maternal rat during gestation, and zinc, iron, copper, and calcium content and enzyme activity in maternal and fetal tissues. *J. Nutr.* (1969) 98(4): 449-58.
- No COC** Cox, N. M., Stuart, M. J., Althen, T. G., Bennett, W. A., and Miller, H. W. enhancement of ovulation rate in gilts by increasing dietary energy and administering insulin during follicular growth. *Journal of Animal Science.* 64 (2). 1987. 507-516.
- In Vit** Coyle, P. Niezing G. Shelton T. L. Philcox J. C. and Rofo A. M. 2000. tolerance to cadmium hepatotoxicity by metallothionein and zinc: in vivo and in vitro studies with mt-null mice. *Toxicology.* 150: 53-67 .
- Phys** Coyle, Peter, Philcox, Jeffrey C., and Rofo, Allan M. metallothionein-null mice absorb less zn from an egg-white diet , but a similar amount from solutions, although with altered intertissue zn distribution. *J. Nutr.* (1999) 129(2): 372-379

- In Vit** Coyle Peter(A), Zalewski Peter D, Philcox Jeffrey C, Forbes Ian J, Ward, A. David, Lincoln Stephen F, Mahadevan Indumathy, and Rofo Allan M. 1994. measurement of zinc in hepatocytes by using a fluorescent probe, zinquin: relationship to metallothionein and intracellular zinc. *Biochemical Journal* 303(3): 781-786.
- Nut** Cozzolino, S. M. F. 1993. zinc bioavailability in the students diet of the university of sao paulo-sp, brazil. study with rats. *Ber. Bundesforschungsanst. Ernaehr. , BFE-R-93-01 Bioavailability '93, Pt. 1* : 253-7.
- Gene** Crabbe, J. C., Merrill, C. M., Kim, D., and Belknap, J. K. 1990. alcohol dependence and withdrawal: a genetic animal model. *Annals of Medicine* 22(4): 259-63.
- Alt** Craft, Neal E. and Failla, Mark L. zinc, iron, and copper absorption in the streptozotocin-diabetic rat. *Am. J. Physiol.* (1983) 244(2): E122-E128.
- HHE** Craig-Schmidt, M. C., Gates, R. R., and Faircloth, S. A. relationship between dietary zinc and polyunsaturated fat (human nutrition, physiological effects in rats). *Highlights Of Agricultural Research - Alabama, Agricultural Experiment Station.* Winter 1983. v. 30 (4) p. 14. ill.
- Alt** Crane, I. J. and Hunt, D. M. 1983. a study of intestinal copper-binding proteins in mottled mice. *Chemico-Biological Interactions* 45(1): 113-24.
- No COC** Crapo, J. D., Sjostrom, K., and Drew, R. T. tolerance and cross tolerance using nitrogen di oxide and molecular oxygen part 1 toxicology and biochemistry. *Journal of Applied Physiology Respiratory Environmental and Exercise Physiology.* 44 (3). 1978 364-369.
- Gene** Crawford, A. W. and Beckerle, M. C. a 23 kda zinc-binding protein identified by iodine-125 zyxin blot overlays. *KEYSTONE SYMPOSIUM ON INTEGRINS: CELL ADHESION AND TRANSMEMBRANE COMMUNICATION IN DEVELOPMENT AND DISEASE, KEYSTONE, COLORADO, USA, APRIL 3-10, 1992. J CELL BIOCHEM SUPPL.* 0 (16 Part F). 1992. 155.
- Gene** Crawford, A. W., Pino, J. D., and Beckerle, M. C. 1994. biochemical and molecular characterization of the chicken cysteine-rich protein, a developmentally regulated lim-domain protein that is associated with the actin cytoskeleton. *Journal of Cell Biology* 124(1-2): 117-27.
- No Tox** Crawford, I. L. and Connor, J. D. zinc in maturing rat brain. hippocampal concentration and localization. *J. Neurochem.* (1972) 19(6): 1451-8.
- CP** Crawford, L. M. and Teske, R. H. growth promotants approved in the usa. *PROCEEDINGS OF AN INTERNATIONAL CONFERENCE ON VETERINARY PHARMACOLOGY, TOXICOLOGY AND THERAPEUTICS, CAMBRIDGE, ENGLAND, JULY 28-AUG. 1, 1980. VET RES COMMUN.* 7 (1-4). 1983 (Recd. 1984). 83-84.
- Abstract** CREECH, B. L., SPEARS, J. W., FLOWERS, W. L., ENGLE, T. E., and LLOYD, K. E. 1998. reducing zinc and copper in swine waste through dietary manipulations. *AMERICAN SOCIETY OF ANIMAL SCIENCE: SOUTHERN SECTION*
- No COC** Creger, C. R., Gardner, F. A., and Farr, F. M. 1973. broiler litter silage for fattening beef animals. *Feedstuffs, USA* 45(3): 25.
- Abstract** Creger, C. R. and Scott, J. T. dietary zinc as an effective resting agent for the laying hen. *Poultry Science.* 56 (5): 1706 1977
- FL** Creger, C. R. and Scott, J. T. 1982. [use of zinc oxide [in feeding] to cause a temporary break in

egg production of laying hens]. <original> impiego di ossido di zinco [nell'alimentazione] per indurre una pausa temporanea nella fecondazione delle ovaiole. *Zootecnica*. V. 22(7) P. 29

- No Oral** Cremades, A., Garcia-Penarrubia, P., Sanchez de Rincon, I., and Garcia, F. effects of endotoxin and sodium arachidonate on body temperature and trace metals in rabbits. *Rev. Farmacol. Clin. Exp.* (1986) 3(4): 281-6.
- Abstract** Crenshaw, T. D(A) and Schneider, D. K(A). 1999. skeletal mineralization of nursery pigs fed diets with pharmacological additions of zinc. *Journal of Animal Science* 77(SUPPL. 1): 178.
- Unrel** Crespo Piero, Mischak Harald, and Gutkind, J. Silvio(A). 1995. overexpression of mammalian protein kinase c-alpha does not affect the growth characteristics of nih 3t3 cells. *Biochemical and Biophysical Research Communications* 213(1): 266-272.
- FL** Creteanu, Emilia, Creteanu, H., Ionut, Carmen, and Vlad, Mariana. 1997. calcium, magnesium, copper and zinc modifications in rats exposed to lead with supplemental dietary fiber intake. *Clujul Med.* 70(3): 425-430 .
- No COC** Crider, A. M., Grubb, R., Bachmann, K. A., and Rawat, A. K. 1981. convenient synthesis of 6-nor-9,10-dihydrolysergic acid methyl ester. *Journal of Pharmaceutical Sciences* 70(12): 1319-21.
- CP** Crino, P., Khodakhah, K., Becker, K., Ginsberg, S., Hemby, S., and Eberwine, J. 1998. presence and phosphorylation of transcription factors in developing dendrites. *Proceedings of the National Academy of Sciences of the United States of*
- Drug** Crofton, R. W., Glover, S. C., Ewen, S. W. B., Aggett, P. J., Mowat, N. A. G., and Mills, C. F. 1983. zinc-absorption in celiac-disease and dermatitis-herpetiformis - a test of small intestinal function. *American Journal Of Clinical Nutrition* 38(5): 706-712.
- Nut** Croker, K. P., Allen, J. G., Masters, H. G., and Petterson, D. S. 1979. the effect of residual grain on the utilization of sweet lupinand concurrent changes associated with lupinosis, in particular changes in liver copper and zinc, in weaner sheep. *Australian Journal of Agricultural Research* 30(5): 929-938.
- Nut** Croker, K. P., Allen, J. G., Masters, H. G., and Petterson, D. S. effect of residual grain on the utilization of sweet lupine stubbles lupinus-angustifolius cultivar unicrop and concurrent changes associated with lupinosis in particular changes in liver copper and zinc in weaner sheep. *Australian Journal of Agricultural Research.* 30 (5). 1979. 929-938.
- QAC** Crookshank, H. R., Elissalde, M. H., White, R. G., Clanton, D. C., and Smalley, H. E. effect of transportation and handling of calves upon blood serum composition. *Journal of Animal Science.* 48 (3). 1979. 430-435.
- Drug** Cross, R. F. and Parker, C. F. 1981. oral administration of zinc sulfate for control of ovine foot rot. *Journal of the American Veterinary Medical Association* 178(7): 704-705.
- CP** Crossley, P. H. and Little, P. F. 1991. a cluster of related zinc finger protein genes is deleted in the mouse embryonic lethal mutation tw18. *Proceedings of the National Academy of Sciences of the United States of*
- HHE** Crouse, S. F., Hooper, P. L., Atterbom, H. A., and Papenfuss, R. L. 1984. zinc ingestion and lipoprotein values in sedentary and endurance-trained men. *Jama-Journal Of The American Medical Association* 252(6): 785-787.

- No Oral** Crusio, W. E. and van Abeelen, J. H. 1987. zinc-induced peripheral anosmia and behavioral responses to novelty in mice: a quantitative-genetic analysis. *Behavioral and Neural Biology* 48(1): 63-82.
- Bio Acc** CRUWYS, E., ROBINSON, K., and DAVIS, N. R. microprobe analysis of trace metals in seal teeth from svalbard greenland and south georgia. *POLAR RECORD*; 30 (172). 1994. 49-52.
- Nut def** Cseh, S., Ridao, M., Casaro, A., Chayer, R., Fernandez Sainz, R., Drake, M., Yarrar, M., Daguerre, S., and Cano, A. 1995. trace elements linked to copper deficiency in cattle. *Revista Argentina De Produccion Animal* 15(3/4): 739-741.
- FL** Cseh, S., Ridao, M., San Martino, S., Drake, M., and Yarrar, M. 1998. serum iron and zinc concentrations in different categories of femalecattle. *Veterinaria Mexico* 29(1): 23-27.
- FL** Cseh, Susana, Ridao, Mariana, San Martino, Silvina, Drake, Monica, and Yarrar, Maria. 1998. [serum concentration of firon and zinc in different categories of female cattle]. <original> valores serologicos de hierro y zinc en distintasc categorias de bovinos hembra. *Veterinaria Mexico*. V. 29(1) P. 23-27
- Nut** Cuca, M. and Sunde, M. L. 1967. the availability of calcium from mexican and californian sesame meals. *Poultry Science* 46(4): 994-1002.
- Gene** Cui, J. Q., Wang, H., Reddy, E. S., and Rao, V. N. 1998. differential transcriptional activation by the n-terminal region of brca1 splice variants brca1a and brca1b. *Oncology Reports* 5(3): 585-9.
- Nut def** Cui, L., Takagi, Y., Wasa, M., Sando, K., Khan, J., and Okada, A. 1999. nitric oxide synthase inhibitor attenuates intestinal damage induced by zinc deficiency in rats. *Journal of Nutrition* 129(4): 792-8.
- Nut def** Cui, Li, Takagi, Yoji, Nezu, Riichiro, Iiboshi, Yasuhiko, Yoshida, Hiroshi, Sando, Kinya, and Okada, Akira. prolonged zinc-deficient diet alters alkaline phosphatase and disaccharidase activities and induces morphological changes in the intestine of rats. *J. Trace Elem. Exp. Med.* (1996) Volume Date 1995-1996, 8(4): 249-261.
- Nut def** Cui, Li, Takagi, Yoji, Sando, Kinya, Nezu, Riichiro, Iiboshi, Yasuhiko, Yoshida, Hiroshi, Masunari, Akira, Kobayashi, Hideyuki, and Okada, Akira. effects of zinc-deficient diet on enzyme activity and intestinal morphology in rats. *Geka to Taisha Eiyo* (1995): 29(1), 55-62.
- Nut def** Cui Li, Takagi Yoji, Wasa Masafumi, Iiboshi Yasuhiko, Khan Jasmine, Nezu Riichiro, and Okada Akira(A). 1997. induction of nitric oxide synthase in rat intestine by interleukin-1-alpha may explain diarrhea associated with zinc deficiency. *Journal of Nutrition* 127(9): 1729-1736.
- FL** Cui, Xi, Jiang, Huimin, Han, Guoan, Cui, Kewei, and Sun, Shuai. the effect of selenium on the contents of zinc and copper in mouse liver, kidney and blood. *Shandong Yike Daxue Xuebao* (1991) 29(4): 316-17 .
- No COC** Cultraro, C. M., Bino, T., and Segal, S. 1997. function of the c-myc antagonist mad1 during a molecular switch from proliferation to differentiation. *Vol. 17, No. 5, Pp. 2353-2359 Mol. Cell. Biol.*
- CP** Cunnane, S. C. 1985. contrasting effects of zinc and copper on the composition of long chain fatty acids in tissue lipids of the rat. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th : Meeting Date 1984, 70-5. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK.*

- Mix** Cunnane, S. C. 1982. essential fatty acids increase zinc absorption in neonatal rats:possible implications for acrodermatitis enteropathica. *Journal of Physiology* 322: 58p.
- Nut def** Cunnane, S. C. 1982. fetal mortality in moderately zinc-deficient rats is strictly related to the process of parturition: effect of maternal essential fatty acid supplementation. *Br. J. Nutr.* (1982) 47(3): 495-504 .
- Nut def** Cunnane, S. C. 1982. foetal mortality in moderately zinc-deficient rats is strictly related to the process of parturition: effect of maternal essential fatty acid supplementation. *The British Journal Of Nutrition.* 47 (3): 495-504.
- No Oral** Cunnane, S. C. 1982. maternal essential fatty-acid supplementation increases zinc absorption in neo natal rats relevance to the defect in zinc absorption acro dermatitis enteropathica. *Pediatric Research.* 16(8): 599-603.
- No Oral** Cunnane, S. C. 1982. maternal essential fatty acid supplementation increases zinc absorptionin neonatal rats: relevance to the defect in zinc absorption inacrodermatitis enteropathica. *Pediatric Research* 16(8): 599-603.
- Rev** Cunnane, S. C. 1988. role of zinc in lipid and fatty-acid metabolism and in membranes. *Progress In Food And Nutrition Science* 12(2): 151-188.
- Abstract** Cunnane, S. C. zinc deficiency increases placental prostaglandin synthesis from arachidonic-acid. 361ST MEETING OF THE NUTRITION SOCIETY, LONDON, ENGLAND, MAY 7, 1981. *PROC NUTR SOC.* 40 (3). 1981. 114a.
- Nut def** Cunnane, S. C. and Chen, Z. Y. 1991. influence of moderate zinc depletion on lipid and essential fatty acid composition in the pregnant rat : comparison with non-pregnant controls. *Trace Elem. Man Anim. 7: Monogr. Proc., Round Tables Discuss. Int. Symp., 7th* : Meeting Date 1990, 18-4-18/5. Editor(s): Momcilovic, Berislav. Publisher: Inst. Med. Res. Occup. Health Univ. Zagreb, Zagreb, Yugoslavia..
- Nut def** Cunnane, S. C. and Horrobin, D. F. parenteral linoleic-acid and gamma linolenic-acid ameliorate the gross effects of zinc deficiency. *Proceedings of the Society for Experimental Biology and Medicine.* 164 (4). 1980. 583-588.
- Nut def** Cunnane, S. C. and Horrobin, D. F. parenteral linoleic and gamma-linolenic acids ameliorate the gross effects of (rat) zinc deficiency (40920). *Proc Soc Exp Biol Med* Sept 1980. v. 164 (4) p. 583-588. ill.
- Nut def** Cunnane, S. C. and Horrobin, D. F. parenteral linoleic and .gamma.-linolenic acids ameliorate the gross effects of zinc deficiency. *Proc. Soc. Exp. Biol. Med.* (1980) 164(4): 583-8.
- Nut def** Cunnane, S. C. and Horrobin, D. F. probable role of zinc in the mobilization of dihomo-.gamma.-linolenic acid and in the desaturation of linoleic acid. *Prog. Lipid Res.* (1981) 20(1-4): 835-7 .
- Nut def** Cunnane, S. C. and Horrobin, D. F. 1985. zinc deficiency, reduced food intake and essential fatty acids [letter]. *Journal of Nutrition.* 115(4): 500-3.
- Nut def** Cunnane, S. C., Horrobin, D. F., and Manku, M. S. 1984. essential fatty acids in tissue phospholipids and triglycerides of the zinc-deficient rat. *Proceedings Of The Society For Experimental Biology And Medicine.* 177(3): 441-446.
- Nut def** Cunnane, S. C., Horrobin, D. F., Ruf, K. B., and Sella, G. prevention of dietary effects of zinc deficiency by administration of essential fatty acids. *J. Physiol. (London)* (1979) : 296 83P-84P

- Nut def** Cunnane, S. C., Horrobin, D. F., and Sella, G. E. effect of essential fatty acid supplementation in rats maintained on dietary zinc deficiency. *Trace Subst. Environ. Health* (1979) : 13, 332-8.
- Abstract** Cunnane, S. C., Majid, E., Senior, J., and Mills, C. F. peri natal mortality in zinc deficient rats is associated with significantly reduced utero placental blood flow. *369TH MEETING OF THE NUTRITION SOCIETY, EDINBURGH, SCOTLAND, MARCH 26, 1982. PROC NUTR SOC.* 41 (2). 1982. 69a.
- In Vit** Cunnane, S. C., Majid, E., Senior, J., and Mills, C. F. 1982. perinatal-mortality in zinc-deficient rats in associated with significantly reduced uteroplacental blood-flow. *Proceedings Of The Nutrition Society* 41: A69.
- Nut def** Cunnane, S. C., Sella, G. E., and Horrobin, D. F. essential fatty acid supplementation inhibits the effect of dietary zinc deficiency. *Adv. Prostaglandin Thromboxane Res.* (1980) : 8, 1797-8
- Nut def** Cunnane, S. C. and Yang, J. zinc deficiency impairs whole-body accumulation of polyunsaturates and increases the utilization of [1-14c]linoleate for de novo lipid synthesis in pregnant rats. *Can. J. Physiol. Pharmacol.* (1995) 73(9): 1246-52.
- Nut def** Cunnane, S. C. and Yang, J. 1995. zinc deficiency impairs whole-body accumulation of polyunsaturates and increases the utilization of (1014c)linoleate for de novo lipidsynthesis in pregnant rats. *Canadian Journal of Physiology and Pharmacology* 73(9): 1246-1252.
- FL** Cunnane, S. C., Yang, J., and Chen, Z. Y. low zinc intake increases apparent oxidation of linoleic and .alpha.-linolenic acids in the pregnant rat. *Can. J. Physiol. Pharmacol.* (1993) 71(3-4): 205-10.
- Nut def** Cunnane, S. C. LIFSA, Majid, E., Senior, J., and Mills, C. F. 1983. uteroplacental dysfunction and prostaglandin metabolism in zinc deficient pregnant rats. *Life Sciences.* 32 (21): 2471-2478.
- No Control** Cunningham, D. L. and McCormick, C. C. 1985. a multicycle comparison of dietary zinc and feed removal molting procedures: production and income performance. *Poultry Science.* 64(2): 253-260.
- Mix** Cunningham, H. M. 1971. effect of caffeine on growth feed efficiency and leanness of growing pigs and its interaction with calcium zinc and corn-m oil. *Canadian Journal of Animal Science.* 51(1): 95-102.
- Unrel** Cupane Antonio, Leone Maurizio, Militello Valeria, Stroppolo, M. Elena, and Desideri Fabio Polticelli And Alessandro(A). 1994. low-temperature optical spectroscopy of native and azide-reacted bovine cu,zn superoxide dismutase. a structure dynamics study. *Biochemistry* 33(50): 15103-15109.
- No COC** Curca, D. 1993. the effect of ascorbic acid and sodium ascorbate on meat chickens under thermal stress. *Lucrari Stiintifice, Universitatea De Stiinte Agronomice, Bucuresti. Seria C, Medicina Veterinara* 36: 21-29.
- Bio Acc** Curnow, R. D. 1971. assimilation and retention of zinc-65 by the mallard duck (anas platyrhynchos). *Proc.3Rd National Symposium on Radioecology, Radionuclides in Ecosystems, May 10-12, 1971, Oak Ridge, TN.* 1: 381-383.
- Surv** Custer, T. W., Franson, J. C., Moore, J. F., and Meyers, J. E. 1986. reproductive success and heavy metal contamination in rhode island common terns. *Environmental Pollution (Series A).* 41: 31-52.

- Surv** Custer, Thomas W. and Hohman, William L. trace elements in canvasbacks (*aythya valisineria*) wintering in louisiana, usa, 1987-1988. *Environ. Pollut.* (1994) 84(3): 253-9 .
- Nut def** Cymbaluk, N. F. and Christison, G. I. effects of dietary energy and phosphorus content on blood chemistry and development of growing horses. *J ANIM SCI. Journal of Animal Science.* 67 (4). 1989. 951-958.
- FL** Czarnowska-Misztal, E., Rutkowska, U., Pietruszka, B., Iwanow, K., and Kunachowicz, H. studies on the utilization of zinc from experimental diets by laboratory rats part i. effect of dietary zinc level and protein source on the indices of general development of rats. *Zywienie Czlowieka i Metabolizm.* 13 (4). 1986 (Recd. 1987). 239-248.
- FL** Czarnowska-Misztal, Elzbieta, Pietruszka, Barbara, Rutkowska, Urszula, Klys, Wojciech, Iwanow, Krystyna, Wojtasik, Anna, and Kunachowicz, Hanna. utilization of zinc from experimental diets by laboratory rats . part v. effect of different protein quality and optimal dietary zinc level on the indexes of general development of rats. *Zywienie Czlowieka Metab.* (1990) 17(3): 151-61.
- FL** Czarnowska-Misztal, Elzbieta, Rutkowska, Urszula, Pietruszka, Barbara, Iwanow, Krystyna, and Kunachowicz, Hanna. utilization of zinc from experimental diets by laboratory rats . i. effect of dietary zinc level and protein source on the indexes of general development of rats. *Zywienie Czlowieka Metab.* (1986) 13(4): 239-48.
- CP** Czupryn Artur. 1995. distribution of zinc in the mouse si barrel cortex of mice during development. *Acta Neurobiologiae Experimentalis (Warsaw)* 55(SUPPL.): 31.
- Phys** Czupryn, Artur and Skangiel-Kramska, Jolanta. distribution of synaptic zinc in the developing mouse somatosensory barrel cortex. *J. Comp. Neurol.* (1997) 386(4): 652-660.
- Nut def** da Cunha Ferreira, R. M., Marquiegui, I. M., and Elizaga, I. V. 1989. teratogenicity of zinc deficiency in the rat: study of the fetal skeleton. *Teratology* 39(2): 181-94 .
- Nut def** Da Cunha Ferreira, R. M. C., Rodriguez Gonzalez, J. I., Monreal Marquiegui, I., and Villa Elizaga, I. changes in the fetal tibial growth plate secondary to maternal zinc deficiency in the rat : a histological and histochemical study. *Teratology* (1991) 44(4): 441-51.
- Unrel** Dabrio, Marta and Rodriguez, Adela R. characterization of zinc metallothioneins by electroanalytical techniques. *Anal. Chim. Acta* (1999) 385(1-3): 295-306.
- Chem Meth** Dabrio Marta and Rodriguez Adela R(A). 1999. characterisation of zinc metallothioneins by electroanalytical techniques. *Analytica Chimica Acta* 385(1-3): 295-306.
- FL** Dadashko, V. V. effect of zinc on mineral metabolism and productivity of laying hens. *Vestsi Akad. Navuk BSSR Ser. Sel'skagaspad. Navuk* (1985): (1), 113-17.
- Nut def** Dadhich, A. P., Vyas, D. S., Sharma, V. N., and Arora, H. L. zinc in experimentally induced hepatitis. a preliminary study in rats. *Curr. Med. Pract.* (1989) 33(2): 41-5.
- Unrel** Dado, R. G. and Allen, M. S. 1993. continuous computer acquisition of feed and water intakes, chewing, reticular motility, and ruminal ph of cattle. *Journal of Dairy Science* 76(6): 1589-1600.
- FL** Daenicke, R. and Oslage, H. J. carbadox as a growth promoter for male friesland veal calves. *Zuechtungskunde.* 53 (4). 1981. 267-275.

- Anat** Dagdeviren, A., Alp, H., and Ors, U. 1994. new applications for the zinc iodide-osmium tetroxide technique. *Journal of Anatomy* 184(Pt 1): 83-91.
- FL** Daghash, H. A. and Mousa, S. M. 1999. zinc sulfate supplementation to ruminant rations and its effects on digestibility in lambs; growth, rectal temperature and some blood constituents in buffalo calves under heat stress. *Assiut Veterinary Medical Journal* 40(80): 128-146.
- Drug** Daghighian, P. and Waibel, P. E. the efficacy of bacitracin methylene di salicylate and zinc bacitracin in turkey nutrition *Poultry Science*. 61 (5). 1982. 962-976.
- Nut def** Dahmer, E. J., Coleman, B. W., Grummer, R. H., and Hoekstra, W. G. 1972. alleviation of parakeratosis in zinc deficient swine by high levels of dietary histidine. *Journal of Animal Science* 35(6): 1181-1189.
- Nut def** Dahmer, E. J., Grummer, R. H., and Hoekstra, W. G. 1972. prevention of zinc deficiency in swine by feeding blood meal. *Journal of Animal Science* 35(6): 1176-1180.
- Nut** Dai Guixiang, Phalen Susan, and McMurray David N(A). 1998. nutritional modulation of host responses to mycobacteria. *Frontiers in Bioscience* 3(CITED JULY 22, 1998): E110-122.
- Nut def** Daijoh, Hideyuki, Norii, Takafumi, and Suzuki, Hiroo. 1997. effects of dietary lipids on zinc metabolism in rats. *Nippon Eiyo Shokuryo Gakkaishi* 50(2): 119-126.
- Nut def** Dalton, Tim, Fu, Kai, Palmiter, Richard D., and Andrews, Glen K. transgenic mice that overexpress metallothionein-i resist dietary zinc deficiency. *J. Nutr.* (1996) 126(4): 825-33.
- Nut def** Dalton Tim(A), Fu Kai(A), Palmiter Richard D, and Andrews Glen K(A). 1995. over-expression of metallothionein-i in transgenic mice protects against teratogenic and embryotoxic effects of zinc-deficiency during early pregnancy. *Biology of Reproduction* 52(SUPPL. 1): 106.
- Nut def** Dameron, C. T. and Harris, E. D. 1987. regulation of aortic CuZn-superoxide dismutase with copper. effects in vivo. *Biochemical Journal* 248(3): 663-8.
- CP** Dameron, C. T. and Harris, E. D. copper-zinc superoxide dismutase in the developing chick aorta a critical role of copper. 69TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ANAHEIM, CALIF., USA, APR. 21-26, 1985. *FED PROC.* 44 (4). 1985. 995.
- Nut def** Damir, H. A., Barri, M. E. S., El-Hassan, S. M., Tageldin, M. H., Wahbi, A. A., and Idris, O. F. 1988. clinical zinc and copper deficiencies in cattle of western sudan. *Tropical Animal Health and Production* 20(1): 52-56.
- FL** Dammann-Tamke, K. and Rickert, J. 1985. secondary parakeratosis in swine-case report from practice. *Praktische Tierarzt* 66(8): 624-626.
- Drug** Damron, B. L., Harms, R. H., Couch, J. R., Smith, T. W. Jr, Day, E. J., and Dilworth, B. C. combined evaluation of 3 broiler trials testing the effects of roxarsone and zinc bacitracin in the presence of aklomide. *POULT SCI. Poultry Science*. 54 (5). 1975 1643-1646.
- Drug** Damron, B. L., Wilson, H. R., and Fell, R. V. 1991. growth and performance of broiler breeders fed bacitracin methylene disalicylate and zinc bacitracin. *Poultry Science*. 70(7): 1487-1492.
- CP** Damron, B. L., Wilson, H. R., and Kelly, L. S. bacitracin methylene disalicylate and zinc bacitracin for the growth and performance of broiler breeders. 6TH ANNUAL MEETING OF THE SOUTHERN POULTRY SCIENCE SOCIETY, ATLANTA, GA., USA, JAN. 22-23, 1985.

POULT SCI. 64 (Suppl. 1). 1985. 13-14.

- Nut** Danek, J. 1998. the effect of zinc supplementation on zinc content in blood serum and seminal plasma and on the quality of stallion semen. *Pferdeheilkunde* 14(3): 231-234, 236-240.
- Nut def** Danek, J., Dabrowska, J., Krumrych, W., <Editors> Gediga, K., and Ciesla, G. 1996. effect of copper deficiency on skeletal development in horses. *Zeszyty Problemowe Postepow Nauk Rolniczych* 434(II): 753-757.
- FL** Danek, J., Wisniewski, E., and Krumrych, W. 1997. effect of zinc and calcium on haematological and blood chemical parameters in stallions. *Medycyna Weterynaryjna* 53(6): 351-354.
- FL** Danek, J., Wisniewski, E., and Krumrych, W. 1996. effects of the dietary calcium excess on the quality of semen installations. *Medycyna Weterynaryjna* 52(7): 459-461.
- FL** Danek, J., Wisniewski, E., and Krumrych, W. 1999. relationships of concentrations of zinc, copper and calcium in blood serum with semen traits in stallions. *Medycyna Weterynaryjna* 55(4): 259-264.
- FL** Danek J(A), Wisniewski, E., and Krumrych, W. 1999. the dependence between concentrations of zinc, copper, and calcium in blood serum and the characteristics of stallion semen. *Medycyna Weterynaryjna* 55(4): 259-264.
- FL** Danek Janusz and Wisniewski Eugeniusz. 1992. the influence of zinc deficit in diet on haematological indices, serum alkaline phosphatase activity, protein concentration in serum and the content of zinc, copper and calcium in sera and hair of stallions. *Medycyna Weterynaryjna* 48(11): 521-523.
- Nut def** Danek Janusz(A) and Wisniewski Eugeniusz. 1992. the changes in the quality of the semen in cases of zinc deficiency. *Medycyna Weterynaryjna* 48(12): 566-568.
- FL** Danek Janusz(A), Wisniewski Eugeniusz, and Krumrych Wieslaw. 1997. effect of zn and ca on haematological and blood biochemical indices of stallions. *Medycyna Weterynaryjna* 53(6): 351-354.
- Nut def** Dangi, P. and Kapoor, A. C. assessment of zinc status in rats. *Indian J. Exp. Biol.* (1983) 21(12): 680-3
- CP** Daniel, J. M. and Reynolds, A. B. 1996. the catenin p120-cas associates with a novel zn finger protein. *Molecular Biology of the Cell* 7(SUPPL.): 457A.
- No Dose** Daniel, M. and Balnave, D. 1980. a comparison of methods of inducing a pause in egg production in crossbred layers. *Australian Journal of Agricultural Research* 31(6): 1153-1161.
- No COC** Danielsson, B. R. G., Dencker, L., Khayat, A., and Orsen, I. 1984. foeto toxicity of inorganic mercury in the mouse distribution and effects on nutrient uptake by placenta and fetus. *Biological Research in Pregnancy and Perinatology*. 5 (3). 102-109.
- CP** Danielsson, O., Atrian, S., Luque, T., Hjelmqvist, L., Gonzalez-Duarte, R., and Jornvall, H. 1994. fundamental molecular differences between alcohol dehydrogenase classes. *Proceedings Of The National Academy Of Sciences Of The United States Of America*. 91(11): 4980-4984.
- CP** Danis, J. and Rudzioniene, J. 1977. study of the level of the biological elements chromium, copper, and zinc in the blood, liver, spleen, and kidneys of rabbits with experimental atherosclerosis. *Mater. Mezhvuz. Nauchn. Konf. Kaunas. Med. Inst.* 25th : Meeting Date 1976,

153-4 Publisher: Kaunas. Med. Inst., Kaunas, USSR..

- FL** Danius, J., Danusupadmo, C. J. S., Sadjirun, S. Badan Tenaga Atom Nasional Jakarta Indonesia, and Soelaksono, E. Pusat Penelitian dan Pengembangan Kesehatan Jakarta Indonesia. 1989. the survival of irradiated lmr white rats treated with zncl2 or znso4 as radioprotektor. <original> ketahanan hidup tikus putih lmr yang diiradiasi dan diberi radioprotektor zncl2 atau znso4. *Majalah Batan*. V. 21(1) P.47-56
- Rev** Danks, D. M. of mice and men, metals and mutations. *J. Med. Genet.* (1986) 23(2): 99-106 .
- Unrel** Dantas, R. P. and Cozzolino, S. M. F. 1990. bioavailability of zinc in the regional diet of sao paulo. *Archivos Latinoamericanos De Nutricion* 40(2): 221-230.
- FL** Dantas, R. P. and Cozzolino, S. M. F. zinc bioavailability in the regional diet of sao paulo. *Arch. Latinoam. Nutr.* (1990) 40(2): 221-30.
- HHE** Dantas, R. P. and Cozzolino, S. M. F. zinc bioavailability of the diet consumed by the low income population of sao paulo brazil study in rats. *SOUTHGATE, D. A. T., I. T. JOHNSON AND G. R. FENWICK (ED.). ROYAL SOCIETY OF CHEMISTRY AND SPECIAL PUBLICATIONS, NO. 72. NUTRIENT AVAILABILITY: CHEMICAL AND BIOLOGICAL ASPECTS; CONFERENCE, NORWICH, ENGLAND, UK, AUGUST 21-24, 1988. XIX+404P. ROYAL SOCIETY OF CHEMISTRY: CAMBRIDGE, ENGLAND, UK. ILLUS. ISBN 0-85186-856-8. 0 (0). 1989. 247-250.*
- Drug** Dar, M. S., Townsend, S. M., and Wooles, W. R. 1986. protective effect of zinc against ethanol toxicity in mice. *Journal of Toxicology and Environmental Health* 18(1): 41-8.
- No Oral** Dar, M. S., Townsend, Sharon M., and Wooles, Wallace R. protective effect of zinc against ethanol toxicity in mice. *J. Toxicol. Environ. Health* (1986) 18(1): 41-8.
- Abstract** Dar, M. S. and Wooles, W. R. effect of zinc on ethanol toxicity in mice. *64TH ANNUAL MEETING OF THE FED. AM. SOC. EXP. BIOL., ANAHEIM, CALIF., USA, APR. 13-18, 1980. FED PROC.* 39 (3). 1980. Abstract 3055.
- No COC** Darden, D. E., Merchen, N. R., Berger, L. L., Fahey, G. C. Jr., and Spears, J. W. 1985. effects of avoparcin, lasalocid and monensin on sites of nutrientdigestion in beef steers. *Nutrition Reports International* 31(4): 979-989.
- Nut** Dardenne, Mireille, Boukaiba, Nadia, Gagnerault, Marie Claude, Homo-Delarche, Francoise, Chappuis, Philippe, Lemonnier, Daniel, and Savino, Wilson. restoration of the thymus in aging mice by in vivo zinc supplementation. *Clin. Immunol. Immunopathol.* (1993) 66(2): 127-35.
- Plant** Darmody, Robert G., Green, William P., and Dreher, Gary B. 1998. coal slurry solids/coal fluidized bed combustion byproduct mixtures as plant growth media. *Int. J. Surf. Min. (Reclam. Environ.)*: 12(3), 111-115 .
- CP** Darmon, N., Heyman, M., Blaton, M. A., Candahl, C., and Desjeux, J. F. 1994. effect of dietary zinc supplementation on the intestinal dysfunction observed during malnutrition. *Gastroenterology* 106(4 SUPPL.): A602.
- CP** Darmon, N., Pelissier, M. A., Chappuis, P., Candalh, C., Blaton, M. A., Albrecht, R., Desjeux, J. F., and Heyman, M. 1996. dietary zinc prevents intestinal dysfunction in malnourished milk-sensitized guinea pigs. *Proceedings of the Nutrition Society* 55(1): 51A.

- Phys** armon, Nicole, Pelissier, Marie-Agnes, Candalh, Celine, Chappuis, Philippe, Blaton, Marie-Agnes, Albrecht, Robert, Desjeux, Jehan-Francois, and Heyman, Martine. zinc and intestinal anaphylaxis to cow's milk proteins in malnourished guinea pigs. *Pediatr. Res.* (1997) 42(2): 208-213.
- Unrel** Daro, A. F. and Zivkovic, D. M. 1976. clinical nutrition: surgical and medical therapy of the future. *International Surgery* 61(5): 262-5.
- Unrel** Das, I., Burch, R. E., and Hahn, H. K. 1984. effects of zinc deficiency on ethanol metabolism and alcohol and aldehyde dehydrogenase activities. *Journal of Laboratory and Clinical Medicine* 104(4): 610-7.
- Unrel** Das, I., Burch, R. E., and Hahn, H. K. J. effects of zinc deficiency on ethanol metabolism and alcohol and aldehyde dehydrogenase activities. *J. Lab. Clin. Med.* (1984) 104(4): 610-17.
- No Oral** Das, R. P. and Perrault, M. J. 1971. androgenic response of the genital accessory organs of thyroxine-treated and castrated rats exposed to cold. *J. Endocrinol.* 49(4): 591-8 .
- FL** Das, V. N. C. and Ferreira, N. J. M. 1981. the level of copper iron manganese and zinc in the blood serum of semi confined and confined goats. *Arquivos Da Escola De Veterinaria Universidade Federal De Minas Gerais.* 33(2): 235-246.
- Org Met** Dash, P. K., Verma, S. V. S., Mahapatra, C. M., and Gopal, R. 1992. response of broilers to certain performance promoters. *Indian Journal of Poultry Science* 27(2): 113-115.
- Abstract** DASHTI, H., BENGMARK, S., JOELSSON, B., ABDULLA, M., SRINIVAS, U., HULTBERG, B., and ISAKSSON, A. 1984. trace metal pattern in toxic liver injury and liver cirrhosis. *19TH MEETING OF THE EUROPEAN ASSOCIATION FOR THE STUDY OF THE LIVER*
- No COC** Dashti, H., Jeppsson, B., Haegerstrad, I., Hultberg, B., Srinivas, U., Abdulla, M., and Bengmark, S. thioacetamide- and carbon tetrachloride-induced liver cirrhosis. *Eur. Surg. Res.* (1989) 21(2): 83-91 .
- Unrel** Dashti, H., Jeppsson, B., Hagerstrand, I., Hultberg, B., Srinivas, U., Abdulla, M., and Bengmark, S. 1989. thioacetamide- and carbon tetrachloride-induced liver cirrhosis. *European Surgical Research* 21(2): 83-91.
- Alt** Dashti, H. M., Abul, H., Behbehani, A., Hussain, T., and Madda, J. P. 1996. interleukin-8 and trace element alterations in experimentally induced liver cirrhosis: the influence of zinc, selenium, and allopurinol treatment. *Journal of Trace Elements in Experimental Medicine* 9(1): 27-40.
- No Oral** Dashti, Hussein, Jeppsson, Bengt, Haegerstrand, Inga, Hultberg, Bjoern, Srinivas, Uppugunduri, Abdulla, Mohammed, Joelsson, Bo, and Bengmark, Stig. early biochemical and histological changes in rats exposed to a single injection of thioacetamide. *Pharmacol. Toxicol. (Copenhagen)* (1987) 60(3): 171-4.
- No Oral** Daston, G. P. 1982. fetal zinc deficiency as a mechanism for cadmium induced toxicity to the developing rat lung and pulmonary surfactant. *Toxicology* 24(1): 55-63.
- No Oral** Daston, G. P. and Baines, D. developmental toxicity of a metallothionein inducer is preventable by maternal zinc infusion. *Toxicologist* 1997 Mar;36(1 Pt 2):103
- Unrel** Daston, G. P., Overmann, G. J., Baines, D., Taubeneck, M. W., Lehman-McKeeman, L. D., Rogers, J. M., and Keen, C. L. altered maternal zn status by alpha-hederin and adverse developmental outcome in rats. *Teratology* 1991 May;43(5):469

- No Oral** Daston, G. P., Overmann, G. J., Baines, D., Taubeneck, M. W., Lehman McKeeman, L. D., Rogers, J. M., and Keen, C. L. 1994. altered zn status by alpha -hederin in the pregnant rat and its relationship to adverse developmental outcome. *Reprod. Toxicol.* 8(1): 15-24.
- Unrel** Daston, G. P., Overmann, G. J., Lehman-Mckeeman, L. D., Rogers, J. M., Taubeneck, M. W., and Keen, C. L. potential role of maternal metallothionein induction in developmental toxicity. *Teratology* 1990 May;41(5):547-8
- No Oral** Daston, George P. fetal zinc deficiency as a mechanism for cadmium-induced toxicity to the developing rat lung and pulmonary surfactant. *Toxicology* (1982) 24(1): 55-63.
- Bact** Dauschies, A. Tierärztliche Hochschule Hannover Hannover Germany Inst. fuer Parasitologie, Imarom, S., and Bollwahn, W. 1999. differentiation of porcine eimeria spp. by morphologic algorithms. *Veterinary Parasitology.* V. 81(3) P. 201-210
- QAC** Daulouede, S., Vincendeau, P., and Ripert, C. 1988. correlation in experimental trypanosomiasis between serum levels of 3metals and resistance induced by high environmental temperature. *Bulletin De La Societe Francaise De Parasitologie* 6(1): 11-14.
- Nut def** Daunizeau, A. and Willemart, J. P. 1985. effect of anabolic treatment on the clinical appearance of zincdeficiency. *Bulletin Mensuel De La Societe Veterinaire Pratique De France* 69(3): 197...207.
- Bio Acc** DAUWE, T., BERVOETS, L., BLUST, R., PINXTEN, R., and EENS, M. are eggshells and egg contents of great and blue tits suitable as indicators of heavy metal pollution? *BELGIAN JOURNAL OF ZOOLOGY*; 129 (2). 1999. 439-447.
- Aquatic** Dave, G., Damgaard, B., Grande, M., Martelin, J. E., Rosander, B., and Viktor, T. 1987. ring test of an embryo-larval toxicity test with zebrafish (brachydanio-rerio) using chromium and zinc as toxicants. *Environmental Toxicology And Chemistry* 6(1): 61-71.
- Phys** Davidson Jana-Lea and Kehl Steven J(A). 1995. changes of activation and inactivation gating of the transient potassium current of rat pituitary melanotrophs caused by micromolar cd-2+ and zn-2+. *Canadian Journal of Physiology and Pharmacology* 73(1): 36-42.
- No Dose** Davies, I. H. 1988. red foot disease in welsh mountain lambs. *Veterinary Record* 122(19): 464-465.
- CP** Davies, M. F., Maguire, P. A., and Loew, G. H. 1992. effect of a benzodiazepine agonist and inverse agonist and zinc on gaba-mediated chloride influx into cerebellar and cortical microsacs. *Society for Neuroscience Abstracts* 18(1-2): 982.
- Nut def** Davies, M. I. and Motzok, I. 1971. zinc deficiency in the chick: effect on tissue alkaline phosphatases. *Comparative Biochemistry and Physiology* 40(1): 129-37 .
- No Oral** Davies, N. T. absorption of zinc by rat intestine.. *British Journal of Nutrition.* 43 (1). 1980. 189-204.
- CP** Davies, N. T. 1979. the effects of dietary fiber on mineral availability. *Dietary Fibre: Curr. Dev. Importance Health [Ed. Proc. Kellogg Nutr. Symp.]*, 3rd : Meeting Date 1977, 113-21. Editor(s): Heaton, Kenneth Willoughby. Publisher: Food & Nutr. Press, Westport, Conn..
- Nut def** Davies, N. T. 1978. the effects of dietary fibre on mineral availability. *Journal of Plant Foods* 3(1/2): 113-123.

No Oral	Davies, N. T. 1980. studies on the absorption of zinc by rat intestine. <i>British Journal of Nutrition</i> 43(1): 189-203.
CP	Davies, N. T., Carswell, A. J. P., and Mills, C. F. 1985. the effect of variation in dietary calcium intake on the phytate-zinc interaction in rats. <i>Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th</i> : Meeting Date 1984, 456-7. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK..
Nut def	Davies, N. T. and Flett, A. A. the similarity between alkaline phosphatase (ec 3.1.3.1) and phytase (ec 3.1.3.8) activities in rat intestine and their importance in phytate-induced zinc deficiency. <i>Br. J. Nutr.</i> (1978) 39(2): 307-16.
Nut	Davies, N. T., Hristic, V., and Flett, A. A. phytate rather than fiber in bran as the major determinant of zinc availability to rats. <i>Nutr. Rep. Int.</i> (1977) 15(2): 207-14.
Nut	Davies, N. T., Hristic, V., and Flett, A. A. 1977. phytate rather than fibre in bran as the major determinant of zinc availability to rats. <i>Nutrition Reports International</i> 15(2): 207-214.
Nut def	Davies, N. T., Soliman, H. S., Corrigan, W., and Flett, A. 1977. the susceptibility of suckling lambs to zinc toxicity. <i>British Journal of Nutrition</i> 38(1): 153-156.
Unrel	Davies Simon J, D'sousa Richard, Philips Helen, Matthey Derek, Hiley Christopher, Hayes John D, Aber Geoffrey M, and Strange Richard C(A). 1993. localisation of alpha, mu and pi class glutathione s-transferases in kidney: comparison with copper zinc superoxide dismutase. <i>Biochimica Et Biophysica Acta</i> 1157(2): 204-208.
Mix	Davis, C. D. 1997. effect of dietary zinc and copper on beta -amyloid precursor protein expression in the rat brain. <i>Journal of Trace Elements in Experimental Medicine</i> 10(4): 249-258.
CP	Davis, G. K. microelement interactions of zinc, copper, and iron in mammalian species (horses, rats, pigs). <i>Annals Of The New York Academy Of Sciences.</i> 1980. v. 355 p. 130-139.
Invert	Davis, G. R. F. and Shah, B. G. effect of supplementary zinc on larvae of the yellow mealworm fed rapeseed protein concentrate. <i>Nutr. Rep. Int.</i> (1980) 22(4): 491-5 .
Invert	Davis, G. R. F. and Shah, B. G. effect of supplementary zinc on larvae of the yellow mealworm tenebrio-molitor fed rapeseed brassica-napus protein concentrate. <i>Nutrition Reports International.</i> 22 (4). 1980. 491-496.
No COC	DAVIS, M. E., FUGO, N. W., and LAWRENCE, K. G. effect of alloxan diabetes on reproduction in the rat. <i>PROC SOC EXP BIOL MED</i> 66:638-641,1947
Bio Acc	Davis, R. H. and Fear, J. 1996. incorporation of selenium into egg proteins from dietary selenite. <i>British Poultry Science</i> 37(1): 197-211.
Alt	Davis, S. R., McMahon, R. J., and Cousins, R. J. 1998. metallothionein knockout and transgenic mice exhibit altered intestinal processing of zinc with uniform zinc-dependent zinc transporter-1 expression. <i>The Journal Of Nutrition.</i> 128(5): 825-831.
CP	Davis Steven R(A) and Cousins Robert J. 1998. altered intestinal zinc absorption in metallothionein transgenic and metallothionein knockout mice. <i>FASEB Journal</i> 12(4): A345.
In Vit	Davis, W. L., Goodman, D. B. P., Kipnis, M., and Matthews, J. L. 1988. immunolocalization of copper-zinc copper-zinc superoxide-dismutase in rat growth plate cartilage. <i>Anatomical Record</i>

220: A28.

- CP** Davis, W. L., Goodman, D. B. P., Kipnis, M., and Matthews, J. L. immunolocalization of copper-zinc superoxide dismutase in rat growth plate cartilage. *101ST ANNUAL MEETING OF THE AMERICAN ASSOCIATION OF ANATOMISTS, CINCINNATI, OHIO, USA, APRIL 24-28, 1988. ANAT REC.* 220 (4). 1988. 28a.
- FL** Davletmendov, F. concentration and distribution of zinc in the organs and tissues of hens. *Khim. Sel'Sk. Khoz.* (1975) 13(8): 604-5.
- CP** Day, M. L., Fahrner, T. J., Aykent, S., and Milbrandt, J. the zinc finger protein ngfi-a exists in both nuclear and cytoplasmic forms in ngf-stimulated pc12 cells. *SYMPOSIUM ON SIGNAL TRANSDUCTION AND GENE ACTIVATION IN DEVELOPMENT HELD AT THE 19TH ANNUAL UCLA (UNIVERSITY OF CALIFORNIA-LOS ANGELES) SYMPOSIA ON MOLECULAR AND CELLULAR BIOLOGY, STEAMBOAT SPRINGS, COLORADO, USA, MARCH 31-APRIL 7, 1990. J CELL BIOCHEM SUPPL.* 0 (14 Part E). 1990. 173.
- Nut def** de Amorim, C. S., Collares, E. F., Rossi, M. A., Zucoloto, S., and de Souza, N. M. 1984. [morphological study of the small intestine in rats with experimental zinc deficiency]. <original> estudo morfologico do intestino delgado de ratos com carencia experimental de zinco. *Arquivos De Gastroenterologia* 20(4): 170-4.
- Food** De Angelis, R. C., Ctenas, M. L., Oguido, A. K., and Orozco, G. A. bioavailability (bav) of zinc and calcium from brazilian staple food. *Spec. Publ. - R. Soc. Chem.* (1989) 72(Nutr. Availability: Chem. Biol. Aspects): 259-61.
- CP** De Angelis, R. C., Giuli, G. G., Rogano, R. N., and Scialfa, J. H. 1991. effect of zinc and selenium of the diet on the body composition. *Trace Elem. Man Anim. 7: Monogr. Proc., Round Tables Discuss. Int. Symp., 7th* : Meeting Date 1990, 10-1-10/2. Editor(s): Momcilovic, Berislav. Publisher: Inst. Med. Res. Occup. Health Univ. Zagreb, Zagreb, Yugoslavia..
- CP** DE FOREST PA and CHOPIN, S. F. 1997. the effect of cadmium and zinc on the developing chick embryo. *ANNUAL MEETING OF THE PROFESSIONAL RESEARCH SCIENTISTS ON EXPERIMENTAL BIOLOGY 97*
- Phys** De, Gritz B G and Rahko, T. 1995. diet-induced residual formation in pigs. *Gerontology* 41(SUPPL. 2): 305-317.
- CP** De Groote Mary Ann, Ochsner Urs A, Shiloh Michael U, Nathan Carl, Mccord Joe M, Dinauer Mary C, Libby Stephen J, Vazquez-Torres Andres, Xu Yisheng, and Fang Ferric C(A). 1997. periplasmic superoxide dismutase protects salmonella from products of phagocyte nadph-oxidase and nitric oxide synthase. *Proceedings of the National Academy of Sciences of the United States of America* 94(25): 13997-14001.
- Phys** De Haan Judy B, Tymms Martin J, Cristiano Francesca, and Kola Ismail(A). 1994 . expression of copper/zinc superoxide dismutase and glutathione peroxidase in organs of developing mouse embryos, fetuses, and neonates. *Pediatric Research* 35(2): 188-196.
- No COC** de Iraldi, A. P. and Gueudet, R. 1968.Action of Reserpine on the Osmium Tetroxide Zinc Iodide Reactive Site of Synaptic Vesicles in the Pineal Nerves of the Rat : 9p.
- Anat** de Iraldi, A. P. and Gueudet, R. 1969.Osmium Tetroxide-Zinc Iodide Reactive Sites in the Photoreceptor Cells of the Retina of the Rat *Zeitschrift Fuer Zellforschung.* 101: 203-211.
- Unrel** DE MELLO W, HOLLAND, R., and DE SOUZA V. pulp capping with calcium hydroxide or

zinc oxide and eugenol: comparative histological study in dogs. *REV FAC ODONTOL ARACATUBA*; 1 (1). 1972 (RECD 1973) 33-43

- Gene** de Murcia, G., Menissier-de Murcia, J., and Schreiber, V. 1991. poly(adp-ribose) polymerase: molecular biological aspects. *BioEssays* 13(9): 455-62.
- Nut** De Oliveira, Silvana P., Reyes, Felix G. R., Sgarbieri, Valdemiro C., Areas, Miguel A., and Ramalho, Antonio C. nutritional attributes of a sweet corn fibrous residue. *J. Agric. Food Chem.* (1991) 39(4): 740-3.
- CP** De Plazas S Fiszer(A), Gravielle, M. C(A), and De Novara A Mitridate(A). 1999. zinc effect on gabaa receptor complex during avian cns development. *Society for Neuroscience Abstracts*. 25(1-2): 1228.
- Abstract** De Rodas B Z(A), Maxwell, C. V(A), Brown, D. C(A), Davis, M. E(A), Johnson, Z. B A, and Fakler, T. M. 1999. effect of diet complexity and supplemental zinc amino acid complexes on performance of nursery pigs. *Journal of Animal Science* 77(SUPPL. 1): 177.
- Bact** DE, RUIJTER K, VERHEIJDEN, J. HM, PIJPERS, A., VAN, LEENGOED L A MG, and BERENDS, J. 1988. fever and changes in plasma zinc and iron concentrations in the sow. *J VET MED SER A*; 35(4): 247-251.
- No COC** De, S. K., Enders, G. C., and Andrews, G. K. high levels of metallothionein messenger rnas in male germ cells of the adult mouse. *MOL ENDOCRINOL. Molecular Endocrinology*. 5 (5). 1991. 628-636.
- Anat** De Simone Giovanni, Devereux Richard B(A), Camargo Maria J F, Wallerson Donald C, and Laragh John H. 1993. influence of sodium intake on in vivo left ventricular anatomy in experimental renovascular hypertension. *American Journal of Physiology* 264(6 PART 2): H2103-H2110.
- IMM** de Sousa, M., Reimao, R., Lacerda, R., Hugo, P., Kaufmann, S. H., and Porto, G. 1994. iron overload in beta 2-microglobulin-deficient mice. *Immunology Letters* 39(2): 105-11.
- FL** De Wilde R. influence of supplementing citrus pectins to a diet with and without antibiotics on the digestibility of the pectins and the other nutrients in pigs . *Z TIERPHYSIOL TIERERNAEHR FUTTERMITTELKD. Zeitschrift Fuer Tierphysiologie Tierernaehrung Und Futtermittelkunde*. 43 (2). 1980. 109-116.
- CP** Dean, C. E., Hargis, B. M., and Hargis, P. S. marginal zinc intake affects postnatal growth and thyroid hormone metabolism. *74TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, PART I, WASHINGTON, D.C., USA, APRIL 1-5, 1990. FASEB (FED AM SOC EXP BIOL) J.* 4 (3). 1990. A387.
- Abstract** Dean, T. L(A), Waterman, R. C(A), Sawyer, J. E(A), Petersen, M. K(A), and Donart, G. B A. 1999. effectiveness of loose zinc sulfate supplementation on average daily gain (adg) of stocker cattle grazing native range. *Journal of Animal Science* 77(SUPPL. 1): 110.
- Phys** Debek, Wojciech A, Chyczewski, Lech, and Farbiszewski, Ryszard. 1999. bn52021 stabilizes the oxidant-antioxidant equilibrium in peritoneal lavage fluid in experimental hemorrhagic shock. *Folia Histochemica Et Cytobiologica* 37(4): 249-254.
- In Vit** DeBin, J. A., Wood, M. R., Pfenninger, K. H., and Strichartz, G. R. a chloride channel reconstituted from fetal rat brain growth cones. *J. Membr. Biol.* (1994) 141(1): 7-19 .

- IMM** Decker, P., Briand, J. P., de Murcia, G., Pero, R. W., Isenberg, D. A., and Muller, S. 1998. zinc is an essential cofactor for recognition of the dna binding domain of poly(adp-ribose) polymerase by antibodies in autoimmune rheumatic and bowel diseases. *Arthritis and Rheumatism* 41(5): 918-26.
- CP** Decloitre, F. and Hamon, G. effect of two pesticides, lindane and zineb, on aflatoxin b1 mutagenesis mediated by rat- and mouse-liver microsomes. *Mutat. Res.* 64(2): 130-131 1979
- FL** Decuypere, E., Helsen, J., Van Gorp, S., and Verheyen, G. the use of high-zinc diets as forced molting method: effect on zinc uptake and egg zinc content. *Arch. Gefluegelkd.* (1988) 52(6): 245-51.
- No COC** Decuypere, E., Isterdael, J. van, Hermans, A., and Michels, H. 1989. effect of antibiotic supplementation in chickens in zaire: comparison with effects in temperate areas. *Tropicultura* 7(3): 87-89.
- Rev** Decuypere, E. and Verheyen, G. physiological basis of induced molting and tissue regeneration in fowls. *World'S Poultry Science Journal.* 42 (1). 1986. 56-68.
- CP** Decuypere, E., Wambeke, F. van, Vermaut, S., Buyse, J., Cokelaere, M., Flo, G., Groote, G. de, <Editors> Princen, L. H., and Rossi, C. 1996. autonomous feed restriction of broiler breeder pullets: jojoba meal, zinc oxide and propionic acid supplementation. <Document Title> *Proceedings of the Ninth International Conference Onjojoba and Its Uses and of the Third International Conference on Newindustrial Crops and Products.* 137-141.
- Abstract** Deebaj, L., Song, M. K., and Mooradian, A. D. 1989. the effect of dietary zinc content on the levels and distribution of copper and zinc in control and diabetic rats. *Abstracts Of Papers Of The American Chemical Society 1989, V197, Apr, P109-Agfd*
- In Vit** Deebaj, L., Song, M. K., and Mooradian, A. D. 1988. levels and distribution of zinc, copper, magnesium, and calcium in control and diabetic rats fed different levels of dietary zinc. *Faseb Journal* 2: A635.
- In Vit** Deebal, L., Song, M. K., and Mooradian, A. D. 1988. the effect of dietary zinc content on micronutrient status of control and diabetic rats. *Clinical Research* 36: A166.
- Nut def** Deeming, Susan B. and Weber, Charles W. evaluation of hair analysis for determination of zinc status using rats. *Am. J. Clin. Nutr.* (1977) 30(12): 2047-52.
- CP** Deetz, L. E., Grant, R. J., Fell, R. V., Waldroup, P. W., Quarles, C. L., Sullivan, T. W., and Mcdougald, L. R. response of turkeys to either bacitracin methylene disalicylate bmd or zinc bacitracin when fed in combination with halofuginone hydrobromide. *TENTH ANNUAL MEETING OF THE SOUTHERN POULTRY SCIENCE SOCIETY. POULT SCI.* 68 (Suppl. 1). 1989. 178.
- Meth** Degener Arthur, Belew Makonnen, and Velander William H(A). 1998. zn!²⁺-selective purification of recombinant proteins from the milk of transgenic animals. *Journal of Chromatography A* 799(1-2): 125-137.
- Drug** Degryse, A-D, Fransen, J., Van, Custem J, and Ooms, L. recurrent zinc-responsive dermatosis in a siberian husky. *Journal of Small Animal Practice.* 28 (8). 1987. 721-726.
- Org Met** Deisch, M. S., Uresk, D. W., and Linder, R. L. effects of prairie dog rodenticides on deer mice in western south dakota usa. *GREAT BASIN NAT. Great Basin Naturalist.* 50 (4). 1990. 347-354.

- No COC** Deisch, M. S. Uresk D. W. and Linder R. L. 1990. effects of prairie dog rodenticides on deer mice in western south dakota. *Great Basin Nat.* 50(4): 347-353.
- FL** Delcueillerie, F. and Pigny, J. P. 1992. what is your diagnosis? a 1,5 year old siberian husky dog with an icterus and behaviour disorders. <original> quel est votre diagnostic? un chien siberian husky de un an et demi presente un ictere accompagne de troubles comportementaux. *Point Veterinaire.* V. 23(142) P. 103-104
- Bact** Delivanis, P. D., Mattison, G. D., and Mendel, R. W. 1983. the survivability of f43 strain of streptococcus sanguis in root canals filled with gutta-percha and prococol cement. *Journal of Endodontics* 9(10): 407-10.
- Phys** Dell'Italia, L. J., Carter, B., Millar, H., and Pohost, G. M. 1991. development of a micromanometer-tip catheter to record high-fidelity pressures during cine-gated nmr without significant image distortion. *Magnetic Resonance in Medicine* 17(1): 119-25.
- FL** Delongear, J. L., Hutin, M. F., Burnel, D., and Grignon, G. 1987. [postnatal development of zinc levels in the epididymis and testis in rats under normal and experimental conditions]. <original> evolution postnatale de la teneur en zinc de l'epididyme et du testicule chez le rat dans les conditions normales et experimentales. *Reproduction, Nutrition, Development* 27(4): 841-8.
- No Tox** Delongear, J. L., Hutin, Marie France, Burnel, D., and Grignon, G. 1987. postnatal epididymal and testicular zinc concentration in the rat under normal and experimental conditions. *Reprod. Nutr., Dev.* 27(4): 841-8 .
- FL** Delongear, J. L. Universite de Nancy-1 Vandoeuvre-les-Nancy France UER des Sciences Medicales Laboratoire d'Histologie Embryologie et Microscopie Electronique, Hutin, M. F., Burnel, D., and Grignon, G. 1987. post-natal epididymal and testicular zinc concentration in the rat under normal and experimental conditions. <original> evolution post natale de la teneur en zinc de l'epididyme et du testicule chez le rat dans les conditions normales et experimentales. *Reproduction Nutrition Developpement.* V. 27(4) P. 841-848
- CP** Deltour, S., Guerardel, C., and Leprince, D. 1999. recruitment of smrt/n-cor-msin3a-hdac-repressing complexes is not a general mechanism for btb/poz transcriptional repressors: the case of hic-1 and gammafbp-b. *Proceedings of the National Academy of Sciences of the United States of*
- No COC** Delzenne, N., Aertssens, J., Verplaetse, H., Roccaro, M., and Roberfroid, M. effect of fermentable fructo-oligosaccharides on mineral, nitrogen and energy digestive balance in the rat. *Life Sci.* (1995) 57(17): 1579-87.
- FL** Dembinski, Z. and Wieckowski, W. evaluation of the prophylactic addition of zinc sulfate to feed of cows in the prevention of early diarrhea of calves in large scale farms. *MED WETER. Medycyna Weterynaryjna.* 42 (3). 1986. 168-171.
- FL** Dembinski, Z., Wieckowski, W., and Kulinska, A. the influence of bentonite of polish production on chosen parameters of a healthy state and productivity in dairy cattle. *Medycyna Weterynaryjna.* 41 (4). 1985. 220-223.
- Drug** Demertzis, P. N. and Mills, C. F. 1973. oral zinc therapy in the control of infectious pododermatitis in youngbulls. *Veterinary Record* 93(No.8): 219-222.
- Phys** Demirsoy, S., Erbas, D., and Hasanoglu, E. the effect of epidermal growth factor on serum zinc levels. *Turkish Journal of Pediatrics.* 33 (3). 1991. 159-162.
- Bio Acc** Dencker, L. and Tjalve, H. an auto radiographic study on the fate of zinc-65 in zinc-rich tissues in

some rodents. *Medical Biology (Helsinki)*. 57 (6). 1979 (Recd. 1980). 391-397.

- IMM** Denduluri, Srinivas, Langdon, Mathew, and Chandra, Ranjit K. effect of zinc administration on immune responses in mice. *J. Trace Elem. Exp. Med.* (1997) 10(3): 155-162.
- Unrel** Deng, D. X., Cai, L., Chakrabarti, S., and Cherian, M. G. 1999. increased radiation-induced apoptosis in mouse thymus in the absence of metallothionein. *Toxicology* 134(1): 39-49.
- Alt** Deng, D. X., Ono, S., Koropatnick, J., and Cherian, M. G. 1998. metallothionein and apoptosis in the toxic milk mutant mouse. *Laboratory Investigation* 78(2): 175-83 .
- FL** Deng Hua (Sichuan Agricultural Univ., Yaan China Dept. of Veterinary Medicine. 1994. experimental pathology of selenium deficiency and effect of high zinc on the se-deficiency in goslings. *Acta Veterinaria Et Zootechnica Sinica*. V. 25(5) P. 442-448
- Nut def** Deng, Xinzhu, Cheng, Guocai, Zhang, Yingyu, and Hou, Yue. interaction between zinc and vitamin a in rats fed zinc-deficient diet by gastric tube. *Yingyang Xuebao* (1990) 12(4): 383-9.
- Nut def** Denko, C. W., Petricevic, M., and Whitehouse, M. W. 1981. 35s incorporation in rats in relation to deprivation of copper and zinc in the diet. *International Journal of Tissue Reactions* 3(3-4): 121-5.
- Nut def** Denko, C. W., Petricevic, M., and Whitehouse, M. W. inflammation in relation to dietary intake of zinc and copper. *Int. J. Tissue React.* (1981) 3(2): 73-6.
- Nut def** Denko, C. W., Petricevic, M., and Whitehouse, M. W. sulfur-35 incorporation in rats in relation to deprivation of copper and zinc in the diet. *Int. J. Tissue React.* (1981) 3(3-4): 121-5
- Bio Acc** Denneman, W. D. and Douben, P. E. T. 1993. trace metals in primary feathers of the barn owl (tyto alba guttatus) in the netherlands. *Environ. Pollut.* 82(3): 301-10 .
- CP** Dennery, P. A., Rodgers, P. A., Sullivan, T. M., and Stevenson, D. K. 1996. evaluation of efficacy of various metalloporphyrins in cultured hamster fibroblasts. *Journal of Investigative Medicine* 44(1): 114A.
- CP** Dennery Phyllis A, Rodgers Pam A, Lum Melissa A, and Stevenson David K. 1993. metalloporphyrins and light: evaluation of safety in neonatal rats. *Clinical Research* 41(2): 297A.
- CP** Dennery Phyllis A, Wong Hubert E, Rodgers Pamela A, Stevenson David K, and Shokoohi Vida. 1994. increased ho-1 expression in cultures of rat fetal lung cells after metalloporphyrin administration. *Pediatric Research* 37(4 PART 2): 202A.
- Unrel** Denzer, Alain J, Nabholz, Christoph E, and Spiess, Martin A. 1995. transmembrane orientation of signal-anchor proteins is affected by the folding state but not the size of n-terminal domain. *EMBO (European Molecular Biology Organization) Journal* 14(24): 6311-6317.
- BioX** Deol, H. S., Howell, J. McC., and Dorling, P. R. 1994. effect of the ingestion of heliotrope and copper on the concentration of zinc, selenium and molybdenum in the liver of sheep. *Journal of Comparative Pathology* 110(3): 303-307.
- Nut def** DePasquale-Jardieu, P. and Fraker, P. J. 1980. further characterization of the role of corticosterone in the loss of humoral immunity in zinc-deficient a/j mice as determined by adrenalectomy. *Journal of Immunology* 124(6): 2650-5.

- Nut def** DePasquale-Jardieu, P. and Fraker, P. J. 1984. interference in the development of a secondary immune response in mice by zinc deprivation: persistence of effects. *The Journal Of Nutrition*. 114(10): 1762-1769.
- Nut def** DePasquale-Jardieu, Paula and Fraker, Pamela J. interference in the development of a secondary immune response in mice by zinc deprivation: persistence of effects. *J. Nutr.* (1984) 114(10): 1762-9.
- Nut def** DePasquale-Jardieu, Paula. and Fraker, Pamela J. the role of corticosterone in the loss in immune function in the zinc-deficient a/j mouse. *The Journal Of Nutrition*. Nov 1979. v. 109 (11) p. 1847-1855. ill., chart.
- FL** Deriugina, O. N., Pisachenko, T. M., and Zhadin, M. N. 1996. [combined effect of variable and static magnetic fields on rat behavior in the "open field "]. <original> kombinirovannoe deistvie peremennogo i postoiannogo magnitnykh polei na povedenie krys v "otkrytom pole". *Biofizika* 41(3): 762-4.
- OAC** Deryugina, O. N., Pisachenko, T. M., and Zhadin, M. N. 1996. combined action of alternating and constant magnetic fields on the behaviour in rats in the "open field". *Vol. 41, No. 3, Pp. 769-771 Biophysics*
- No COC** Deryugina, O. N., Pisachenko, T. M., and Zhadin, M. N. 1996 . combined action of alternating and static magnetic fields on behaviour of rats in the "open field" test. *Biofizika* 41(3): 762-764.
- Unrel** Deshmukh, D. R., Mirochnitchenko, O., Ghole, V. S., Agnese, D., Shah, P. C., Reddell, M., Brolin, R. E., and Inouye, M. 1997. intestinal ischemia and reperfusion injury in transgenic mice overexpressing copper-zinc superoxide dismutase. *American Journal of Physiology* 273(4 Pt 1): C1130-5.
- In Vit** Desideri, A., Cocco, D., Calabrese, L., and Rotilio, G. cobalt ii derivatives of copper zinc superoxide dismutase with the cobalt bound in the place of copper a new spectroscopic tool for the study of the active site. *Biochimica Et Biophysica Acta*. 785 (3). 1984. 111-117.
- Unrel** Desideri Alessandro(A), Polticelli Fibio, Falconi Mattia, Sette Marco, Ciriolo Maria Rosa, Paci Maurizio, and Rotilio Giuseppe. 1993. electrostatic recognition in redox copper proteins: a proton nmr study of the protonation behavior of his 19 in oxidized and reduced copper, zinc superoxide dismutase. *Archives of Biochemistry and Biophysics* 301(2): 244-250.
- Nut def** Dettger, W. J. 1985. effect of dietary protein or amino acids on the rapid change in plasma zinc concentration in rats fed zinc deficiency diets. *Nutrition Research*. 5(10): 1153-1159.
- No COC** Devaney, J. A. 1985. progress on control of northern fowl mites on caged laying hens. *Veterinary Parasitology* 18(3): 289-95.
- Org Met** Deveci, Engin, Guven, Kemal, Bashan, Mehmet, Onen, Abdurrahman, and De Pomerai, David. the accumulation and histological effects of organometallic fungicides propineb and maneb in the livers of pregnant rats and their offspring. *J. Toxicol. Sci.* (1999) 24(2): 79-85.
- No Oral** Devor, M. and Murphy, M. R. 1973. the effect of peripheral olfactory blockade on the social behavior of the male golden hamster. *Behavioral Biology* 9(1): 31-42.
- Nut def** Dewar, W. A. and Downie, J. N. 1984. the zinc requirements of broiler chicks and turkey poults fed on purified diets. *Br. J. Nutr.* 51(3): 467-77.

- Nut def** Dewar, W. A., Sibbald, I. R., and Wight, P. A. L. the contribution of anorexia to reduced growth in zinc-deficient chickens. *Br. Poult. Sci.* (1982) 23(2): 129-34.
- CP** Dewar, W. A., Whitehead, C. C., Downie, J. N., and Potter, E. 1975. the retention of calcium, iron, magnesium and zinc in chicks fed on diets containing metal soaps. *Proceedings of the Nutrition Society* 34(1): 5A-6A.
- No Oral** Dewoskin, R. S., Page, R. L., and Riviere, J. E. kidney trace metal response to combined cisplatin (cddp) and hyperthermia. *Int. J. Hyperthermia* (1993) 9(4): 529-37.
- Nut def** DeWys, William and Pories, Walter. inhibition of a spectrum of animal tumors by dietary zinc deficiency. *J. Nat. Cancer Inst.* (1972) 48(2): 375-81.
- Nut def** DeWys, William, Pories, Walter J., Richter, Margie C., and Strain, William H. inhibition of walker 256 carcinosarcoma growth by dietary zinc deficiency. *Proc. Soc. Exp. Biol. Med.* (1970) 135(1): 17-22.
- No Tox** Deyhim, Farzad, Stoecker, Barbara S., Adeleye, Bernece G., and Teeter, Robert G. 1995. the effects of heat distress environment, vitamin, and trace mineral supplementation on performance, blood constituents, and tissue mineral concentrations in broiler chickens. *Nutr. Res. (N. Y.)* 15(4): 521-6.
- In Vit** Dhanotiya, R. S., Bhardwaj, R., and Srivastava, H. S. 1987. properties of fructose-1,6-biphosphatase of fetal and adult goat liver. *Archiv Fur Experimentelle Veterinarmedizin* 41(4): 479-485.
- Mix** Dhawan, D. K. and Goel, A. 1994. protective role of zinc on rat liver function in long-term toxicity induced by carbon tetrachloride. *J. Trace Elem. Exp. Med.* 7(1): 1-9.
- Biom** Dhawan, M., Flora, S. J., Singh, S., and Tandon, S. K. 1989. chelation of lead during co-exposure to ethanol. *Biochemistry International* 19(5): 1067-75.
- No COC** Dhiman, T. R., Arora, S. P., and Atreja, P. P. 1988. effect of feeding urea and ammonium sulfate on nutrient utilization and mineral balance in cattle and buffalo calves. *Asian Journal of Dairy Research.* 7(3): 135-141.
- Unrel** Dhir Haimanti(A), Roy Ajoy Kumar, and Sharma Archana. 1993. relative efficiency of phyllanthus emblica fruit extract and ascorbic acid in modifying lead and aluminium-induced sister-chromatid exchanges in mouse bone marrow. *Environmental and Molecular Mutagenesis* 21(3): 229-236.
- Nut def** Diamond, I. and Hurley, L. S. 1970. histopathology of zinc-deficient fetal rats. *Journal of Nutrition* 100(3): 325-9.
- Nut def** Diamond, I., Swenerton, H., and Hurley, L. S. 1971. testicular and esophageal lesions in zinc-deficient rats and their reversibility. *Journal of Nutrition* 101(1): 77-84.
- Nut def** Diamond, Israel, Swenerton, Helene, and Hurley, Lucille S. testicular and esophageal lesions in zinc-deficient rats and their reversibility. *J. Nutr.* (1971) 101(1): 77-84.
- Nut def** Diaz Diaz, R., Gonzalez Perez, T. L., Padron Herrera, M., Rodriguez Suarez, A., and Perez Arce, J. 1988. adenohipophyseal concentration of prolactin in zinc-deficient rats. *Revista Cubana Alimentacion y Nutricion* 2(1): 111-119.
- Nut def** Dib, A. and Carreau, J. P. 1986. effects of gamma-linolenic acid supplementation on lipogenesis

regulation in pregnant zinc-deficient rat and fetus. *The International Journal Of Biochemistry*. 18(11): 1053-1056.

- FL** Dib, A. and Carreau, J. P. 1987. effects of gamma-linolenic acid supplementation on pregnant rats fed a zinc-deficient diet. *Annals Of Nutrition And Metabolism*. 31(5): 312-319.
- FL** Dib, A., Carreau, J. P., <Editors> Favier, A., Arnaud, J., and Faure, H. 1987. effect of supplementation with gamma -linolenic acid on pregnant rats with zinc deficiency. <document title>le zinc en medecine et biologie. 89-92.
- Nut def** Dib, A., Carreau, J. P., <Editors> Lemonnier, D., and Ingenbleek, Y. 1989. zinc deficiency and pregnancy: effects of supplementation with gamma-linolenic acid on hepatic lipid metabolism. <document title>les carences nutritionnelles dans les pays en voie de developpement. 3es journees scientifiques internationales du germe, nianing (senegal) 4-9 octobre 1987. 449-454.
- Nut def** Dib, A., Clavel, J. P., and Carreau, J. P. 1989. effects of gamma-linolenic acid supplementation on lipid-composition of liver microsomal-membranes .2. fetuses from pregnant rats fed a zinc-deficient diet and those from rats fed a balanced one. *Journal Of Clinical Biochemistry And Nutrition* 6(2): 103-108.
- Nut def** Dib, A., Clavel, J. P., and Carreau, J. P. 1989. effects of gamma-linolenic acid supplementation on lipid-composition of liver microsomal-membranes .1. pregnant rats fed a zinc-deficient diet and those fed a balanced one. *Journal Of Clinical Biochemistry And Nutrition* 6(2): 95-102.
- Nut def** Dib, Amale and Carreau, Jean Paul. effects of .gamma.-linolenic acid supplementation on lipogenesis regulation in pregnant zinc-deficient rat and fetus. *Int. J. Biochem.* (1986) 18(11): 1053-6.
- Nut def** Dib, Amale, Clavel, Jean Pierre, and Carreau, Jean Paul. effects of gamma-linolenic acid supplementation on lipid composition of liver microsomal membranes. ii. fetuses from pregnant rats fed a zinc-deficient diet and those from rats fed a balanced one. *J. Clin. Biochem. Nutr.* (1989) 6(2): 103-8.
- Nut def** Dibi, K. and Reber, E. F. 1987. effects of zinc depletion and repletion during lactation on rat dams and their offspring. *Nutrition Reports International*. 35(4): 743-753.
- Diss** Dibi, Kenneth. 1985. effects of zinc depletion and repletion during lactation on rat dams and their offspring. Avail.: Univ. Microfilms Int. Order No. DA8608485 From: Diss. Abstr. Int. B 1986, 47. 2. 578. 108 pp.
- Abstract** Dicapua, R. A., Shippee, R. L., Atton, A. V., Stake, P. E., and Koehn, U. murine adiposia induced by zinc deficiency or cadmium strain differences conditioned aversion and influence of dietary zinc. 66TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, NEW ORLEANS, LA., USA, APRIL 15-23, 1982. FED PROC. 41 (3). 1982. Abstract 2979.
- Unrel** Dick, Caroline M. and Hobkirk, Ronald. characteristics and behavior during partial purification of estrogen sulfotransferase of guinea pig liver and chorion. *Biochim. Biophys. Acta* (1987) 925(3): 362-70.
- Aquatic** DICKMAN, M. an isolated population of fourhorn sculpins (*myoxocephalus quadricornis*, family cottidae) in a hypersaline high arctic canadian lake. *HYDROBIOLOGIA*; 312 (1). 1995. 27-35.
- Nut def** Dicks, D., Rojhani, A., and Cossack, Z. T. the effect of growth hormone treatment on growth in zinc deficient rats. *Nutr. Res. (N. Y.)* (1993) 13(6): 701-13 .

- Phys** Didolkar, A. K., Bertram, H. P., Zaidi, P., Neumann, F., and Nieschlag, E. 1982. comparison of the antispermatogenic effects of a new d-homo-steroid and testosterone in rabbits. *Int. J. Androl.* 5(4): 413-24 .
- Nut** Dierenfeld, E. S., Fitzpatrick, M. P., Douglas, T. C., and Dennison, S. A. 1996. mineral concentrations in whole mice and rats used as food. *Zoo Biology.* 15(1): 83-88.
- Unrel** Dietrich, H., Macgibbon, A. K. H., Dunn, M. F., and Zeppezauer, M. investigation of the ph dependencies of coenzyme binding to liver alcohol dehydrogenase lacking zinc ion at the active sites. *Biochemistry.* 22 (14). 1983. 3432-3438.
- CP** Dietsch, P., Vormann, J., and Guenther, T. acetazolamide teratogenesis and placental carbonic anhydrase. *INTERNATIONAL SYMPOSIUM ON PHARMACOKINETICS IN TERATOGENESIS, WEST BERLIN, WEST GERMANY, SEPT. 13-15, 1985. TERATOLOGY.* 33 (2). 1986. 53a-54a.
- FL** Dilov, P. and Chak"rov, R. 1984. incidence and prophylaxis of anaemia in industrial pig farming. *Veterinarnomeditsinski Nauki* 21(9): 111-119.
- FL** Dilov, P. and Chak"Rov, R. the occurrence and the drug prophylaxis of anemia in pigs in industrial pig farming. *Veterinarno Meditsinski Nauki.* 21 (9). 1984 (Recd. 1985). 111-119.
- FL** Dilov, P., Chak"Rov, R., Iotsev, M., and Jordanov, S. comparative investigations on the absorption antianemic action and growth effect of fb-82 and dextrofer-100 in pigs. *VET MED NAUKI. Veterinarno Meditsinski Nauki.* 21 (5). 1984. 77-85.
- Drug** Dilsiz, Nihat, Olcucu, Ali, Cay, Mehmet, Naziroglu, Mustafa, and Cobanoglu, Dursun. protective effects of selenium, vitamin c and vitamin e against oxidative stress of cigarette smoke in rats. *Cell Biochem. Funct.* (1999) 17(1): 1-7.
- No Dose** Dilts, P. V. Jr. and Ahokas, R. A. effects of dietary lead and zinc on fetal organ growth (rats, effects of lead toxicity on the fetus, possible protective effects of zinc). *American Journal Of Obstetrics And Gynecology.* Apr 1, 1980. v. 136 (7) p. 889-896. ill.
- No Dose** Dilts, P. V. Jr. and Ahokas, R. A. 1979. effects of dietary lead and zinc on pregnancy. *American Journal of Obstetrics and Gynecology* 135(7): 940-946.
- No COC** Dilts, Preston V. Jr. and Ahokas, Robert A. effects of dietary lead and zinc on fetal organ growth. *Am. J. Obstet. Gynecol.* (1980) 136(7): 889-96 .
- Mix** Dilts, Preston V. Jr. and Ahokas, Robert A. effects of dietary lead and zinc on pregnancy . *Am. J. Obstet. Gynecol.* (1979) 135(7): 940-6 .
- No COC** DiMarco, J. P. and Hoppel, C. 1975. hepatic mitochondrial function in ketogenic states. diabetes,starvation, and after growth hormone administration. *Journal of Clinical Investigation* 55(6): 1237-1244.
- FL** Ding, H., Peng, R., and Chen, J. 1998. [effects of high dietary zinc on liver function, hepatic drug metabolism enzymes and membrane fluidity in mice]. *Wei Sheng Yen Chiu* 27(3): 180-2.
- FL** Ding, Hong, Peng, Renxiu, and Chen, Jianhua. effects of high dietary zinc intake on liver function, hepatic drug metabolism enzymes and membrane fluidity in mice. *Weisheng Yanjiu* (1998) 27(3): 180-182.
- FL** Ding, Hong, Peng, Renxiu, Cheng, Lu, Kong, Rui, Wang, Ruokun, and Chen, Jianhua. effects of

high dietary zinc on normal mice . influence on antioxidant and nitric oxide content of internal organs. *Weisheng Yanjiu* (1997) 26(6): 391-393.

- FL** Ding, Hong, Peng, Renxiu, Kong, Rui, Li, Ying, and Wang, Ruokun. effects of high dietary zinc on mice . ii. influence on growth , blood composition and immune function. *Weisheng Yanjiu* (1997) 26(5): 325-326.
- FL** Ding, Hong, Peng, Renxiu, Wang, Ruokun, and Cheng, Lu. effects of high dietary zinc on alloxan induced diabetic mice. *Weisheng Yanjiu* (1997) 26(4): 245-246.
- FL** Ding, X. C., Liu, C. F., and Dong, J. W. 1988. antagonistic effects of zinc on inhibition of delta-aminolevulinic-acid dehydratase by lead. *Acta Pharmacologica Sinica* 9(2): 185-188.
- No COC** Dinkel, A., Warnatz, K., Ledermann, B., Rolink, A., Zipfel, P. F., Buerki, K., and Eibel, H. 1998. the transcription factor early growth response 1 (egr-1) advances differentiation of pre-b and immature b cells. *Vol. 188, No. 12, Pp. 2215-2224 Journal Of Experimental Medicine*
- Fate** Dinsdale, D. 1984. ultrastructural localization of zinc and calcium within the granules of rat paneth cells. *Journal of Histochemistry and Cytochemistry* 32(2): 139-45.
- No Oral** Dinsdale, D. and Biles, B. 1986. postnatal changes in the distribution and elemental composition of paneth cells in normal and corticosteroid-treated rats. *Cell and Tissue Research* 246(1): 183-7.
- Nut def** Dinsdale, D. and Williams, R. B. the enhancement by dietary zinc deficiency of the susceptibility of the rat duodenum to colchicine. *Br. J. Nutr.* (1977) 37(1): 135-42 .
- Nut def** Dinsdale, D. and Williams, R. B. ultrastructural changes in the sperm tail of zinc-deficient rats. *Journal Of Comparative Pathology.* Oct 1980. v. 90 (4) p. 559-566. ill.
- In Vit** Dinsdale, David. ultrastructural localization of zinc and calcium within the granules of rat paneth cells. *J. Histochem. Cytochem.* (1984) 32(2): 139-45 .
- Bio Acc** Dinslage-Schluenz, Annedore, Rosmanith, Jindrich, Backheuer, D., and Bianchi, P. the normal zinc content in lungs and other organs of rats in dependence upon age. *Beitr. Silikose-Forsch. (Pneumokoniose)* (1976) 28(2): 57-68 .
- CP** Dinsmore, W. W., McMaster, D., and Love, A. H. G. zinc and alcohol absorption from the lumen of the rat small intestine. *Trace Elements In Man And Animals : Tema 5 : Proceedings Of The Fifth International Symposium On Trace Elements In Man And Animals / Editors C.f. Mills, I. Bremner, & J.k. Chesters.* p. 408-411.
- Bio Acc** Dintzis, F. R., Laszlo, J. A., Nelsen, T. C., Baker, F. L., and Calvert, C. C. 1995. free and total ion concentrations in pig digesta. *Journal of Animal Science* 73(4): 1138-1146.
- No Oral** DiSilvestro, R. A. and Carlson, G. P. 1991. effects of moderate copper deficiency on carbon tetrachloride-induced hepatotoxicity in rats. *Proceedings Of The Society For Experimental Biology And Medicine.* 197(1): 32-35.
- Unrel** Disilvestro, R. A. and Cousins, R. J. 1983. physiological ligands for copper and zinc. *Annual Review Of Nutrition* 3: 261-288.
- Unrel** DiSilvestro, R. A. and Marten, J. T. 1990. effects of inflammation and copper intake on rat liver and erythrocyte-cu-zn superoxide dismutase activity levels. *Journal of Nutrition* 120(10): 1223-1227.

- Nut def** DiSilvestro, Robert A. and Carlson, Gary P. effects of mild zinc deficiency, plus or minus acute phase response, on ccl4 hepatotoxicity. *Free Radical Biol. Med.* (1994) 16(1): 57-61.
- Unrel** Ditelberg, J. S., Sheldon, R. A., Epstein, C. J., and Ferriero, D. M. 1996. brain injury after perinatal hypoxia-ischemia is exacerbated in copper/zinc superoxide dismutase transgenic mice. *Pediatric Research* 39(2): 204-8.
- Nut** Ditoro, R. 1983. zinc in pediatric nutrition. *Rivista Italiana Di Pediatria-Italian Journal Of Pediatrics* 9(1): 11-17.
- CP** Dittmer, K., Gourley, G., Leman, A., and Johnson, D. the effect of zinc bacitracin and bacitracin methylene disalicylate on performance of finishing pigs. *MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE AND AMERICAN DAIRY SCIENCE ASSOCIATION, MIDWESTERN SECTION, DES MOINES, IOWA, USA, MARCH 23-25, 1992. J ANIM SCI.* 70 (Suppl. 1). 1992. 62.
- Unrel** Dittrich, R., Bossing, T., Gould, A. P., Technau, G. M., and Urban J(A). 1997. the differentiation of the serotonergic neurons in the drosophila ventral nerve cord depends on the combined function of the zinc finger proteins eagle and huckebein. *Development (Cambridge)* 124(13): 2515-2525.
- FL** Djarraya, C. and Carreau, J. P. 1986. effect of zinc deficiency on the metabolism of lipids. <document title>les malnutritions dans les pays du tiers-monde. 299-304.
- Nut def** Djarraya, C. and Carreau, J. P. 1986. effects of zinc deficiency on membrane lipid metabolism. *Inst. Natl. Sante Rech. Med. [Colloq.]* 126: (Malnutr. Pays Tiers-Monde), 299-304.
- FL** Djarraya, C., Carreau, J. P., <Editors> Favier, A., Arnaud, J., and Faure, H. 1987. effects of zinc deficiency on hepatic metabolism of lipids in wistarrats. <document title>le zinc en medecine et biologie. 47-49.
- BioX** Djavani, M., Lukashevich, I. S., and Salvato, M. S. 1998. sequence comparison of the large genomic rna segments of two strains of lymphocytic choriomeningitis virus differing in pathogenic potential for guinea pigs. *Virus Genes* 17(2): 151-5.
- FL** Dmitriev, P. P. reproduction of the great gerbil after sudden decreases in their numbers in the aral sea region of the kara-kum desert. *Ekologiya. Ekologiya (Sverdlovsk).* (1). 1977 101-104.
- Bio Acc** Dmowski, K. 1993. lead and cadmium contamination of passerine birds (starlings) during their migration through a zinc smelter area. *ACTA ORNITHOLOGICA (WARSAW).* 28(1): p1-9.
- Soil** Dmowski, Krzysztof, Kozakiewicz, Anna, and Kozakiewicz, Michal. small mammal populations and community under conditions of extremely high thallium contamination in the environment. *Ecotoxicol. Environ. Saf.* (1998) 41(1): 2-7.
- Surv** Dmowski, Krzysztof, Kozakiewicz, Michal, Kozakiewicz, Anna, and Tarkowski, A. K. ecological effects of heavy metal pollution (pb, cd, zn) on small mammal populations and communities. *Bull. Pol. Acad. Sci.: Biol. Sci.* (1995) 43(1): 1-10.
- FL** Dobenecker, B., Zottmann, B., Kienzle, E., Wolf, P., and Zentek, J. milk yield and milk composition of lactating queens. *J. Anim. Physiol. Anim. Nutr.* (1998) 80(2-5): 173-178.
- HHE** Dobin, S. M. and Howell, R. R. comparison of zinc concentrations in hair and other tissues. *32ND ANNUAL MEETING OF THE AMERICAN SOCIETY OF HUMAN GENETICS, DALLAS, TEX., USA, OCT. 28-31, 1981. AM J HUM GENET.* 33 (6). 1981 (Recd. 1982). 41a.

- Unrel** Dodman, N. H., Bronson, R., and Gliatto, J. 1993. tail chasing in a bull terrier. *Journal of the American Veterinary Medical Association* 202(5): 758-60.
- Unrel** Dodman, N. H., Knowles, K. E., Shuster, L., Moon-Fanelli, A. A., Tidwell, A. S., and Keen, C. L. 1996. behavioral changes associated with suspected complex partial seizures in bull terriers. *Journal Of The American Veterinary Medical Association*. 208(5): 688-691.
- CP** Dodson, W. L. and Theuri, S. 1997. effects of dietary magnesium on magnesium and copper status and activity of selected antioxidant enzymes in adult male rats. *FASEB Journal* 11(3): A147.
- Nut def** Doerup, Inge and Clausen, Torben. effects of magnesium and zinc deficiencies on growth and protein synthesis in skeletal muscle and the heart. *Br. J. Nutr. (1991)* 66(3): 493-504.
- Nut def** Doerup, Inge, Flyvbjerg, Allan, Everts, Maria E., and Clausen, Torben. role of insulin-like growth factor-1 and growth hormone in growth inhibition induced by magnesium and zinc deficiencies. *Br. J. Nutr. (1991)* 66(3): 505-21.
- An Prod** Dogadaeva, I. V. effect of different levels of metabolic energy, crude protein, and zinc in the ration of broilers on several metabolic indexes. *Aktual. Probl. Razvit. Ptitsevod. (1973)* : 6, 144-9.
- FL** Dogadaeva, I. V. and Petrukhin, I. V. effect of zinc on several indexes of metabolism in broilers. *Mater. Vses. Nauch. Soveshch. Konf. Vses. Nauch.-Issled. Tekhnol. Inst. Ptitsevod. (1972)*: No. 5, 214-17.
- Nut** Dogra, K. K., Katoch, B. S., and Marwaha, C. L. 1996. comparative nutritive value of hays from the humid sub-tropical and wet-temperate grasslands of himachal pradesh for crossbred calves. *Indian Journal of Animal Sciences* 66(10): 1052-1054.
- Dead** Dogra, R. K. S., Murthy, R. C., Srivastava, A. K., Gaur, J. S., Shukla, L. J., and Varmani, B. M. L. 1996. cattle mortality in the thane district, india: a study of cause/effect relationships. *Archives of Environmental Contamination and Toxicology* 30(2): 292-297.
- No COC** Dokukin, A. P. and Egorov, B. M. 1982. requirements of fine-wooled rams for dietary phosphorus. *Ovtsevodstvo* (3): 19-20.
- FL** Dokukin, A. P. and Egorov, B. M. 1982. standards for phosphorus nutrition of fine-wooled breeding rams. *Zhivotnovodstvo* (4): 40-41.
- Rev** Domingo, J. L. 1994. metal-induced developmental toxicity in mammals: a review. *J.Toxicol.Environ.Health.* 42(2): 123-141.
- HHE** Domingo, J. L., Llobet, J. M., Colomina, M. T., and Corbella, J. 1988. the removal of zinc from the mouse by polyaminocarboxylic acids (cdta and dtpa) following semichronic zinc ingestion. *Veterinary and Human Toxicology* 30(6): 524-7.
- HHE** Domingo, J. L., Llobet, J. M., Paternain, J. L., and Corbella, J. 1988. acute zinc intoxication: comparison of the antidotal efficacy of several chelating agents. *Veterinary and Human Toxicology* 30(3): 224-8.
- Drug** Domingo, Jose L., Gomez, Mercedes, and Jones, Mark M. concurrent administration of d-penicillamine and zinc has no advantages over the use of either single agent on copper excretion in the rat. *Toxicology (1998)* 126(3): 195-201.

- Nut def** Donaldson, D. L., Kubo, C., Smith, C. C., and Good, R. A. 1986. effects of genetic diabetes and zinc nutriture on in vivo cell-mediated immunity in the mouse. *American Journal of Clinical Nutrition* 43(2): 263-71.
- Nut def** Donaldson, D. L., Smith, C. C., Walker, M. S., and Rennert, O. M. 1988. tissue zinc and copper levels in diabetic c57bl/ksj (db/db) mice fed a zinc-deficient diet: lack of evidence for specific depletion of tissue zinc stores. *Journal of Nutrition* 118(12): 1502-8.
- IMM** Donaldson, David L., Kubo, Chiharu, Smith, Cynthia C., and Good, Robert A. effects of genetic diabetes and zinc nutriture on in vivo cell-mediated immunity in the mouse. *Am. J. Clin. Nutr.* (1986) 43(2): 263-71 .
- Nut def** Donaldson, David L., Smith, Cynthia C., Walker, Michael S., and Rennert, Owen M. tissue zinc and copper levels in diabetic c57bl/ksj (db/db) mice fed a zinc-deficient diet : lack of evidence for specific depletion of tissue zinc stores. *J. Nutr.* (1988) 118(12): 1502-8.
- HHE** Donangelo, C. M., Pedersen, B., and Eggum, B. O. protein energy and mineral utilization in rats fed rice-legume diets. *Qualitas Plantarum Plant Foods for Human Nutrition.* 36 (2). 1986. 119-138.
- Nut** Donangelo, C. M., Trugo, N. M. F., Koury, J. C., Barretosilva, M. I., Freitas, L. A., Feldheim, W., and Barth, C. 1989. iron, zinc, folate and vitamin-b12 nutritional-status and milk-composition of low-income brazilian mothers. *European Journal Of Clinical Nutrition* 43(4): 253-266.
- Nut** Donangelo, Carmen M. and Eggum, B. O. comparative effects of wheat bran and barley husk on nutrient utilization in rats . 2. zinc, calcium and phosphorus. *Br. J. Nutr.* (1986) 56(1): 269-80 .
- In Vit** Donnelly, J. L. and Pallotta, B. S. 1995. single-channel currents from diethylpyrocarbonate-modified nmda receptors in cultured rat brain cortical neurons. *Journal of General Physiology* 105(6): 837-59.
- CP** Donoghue, D. J. and Odom, T. W. hyperthermia in the laying hen effects of aminophylline parathyroid hormone and dietary zinc on bone physiology and shell quality. *75TH ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC. POULT SCI.* 65 (Suppl. 1). 1986. 36.
- Nut** Donoghue, S., Kronfeld, D. S., Dunlap, H. L., and Schryver, H. F. 1993. vitamin c supplementation of sled dogs in relation to racing and stress. *Recueil De Medecine Veterinaire* 169(10): 773-777.
- Nut** Donoghue, Suzan, Kronfeld, D. S., Dunlap, H. L., and Schryver, H. F. vitamin c supplementation of sled dogs affects responses to racing and stress. *Recl. Med. Vet.* (1993) 169(10): 773-7 .
- Drug** Donoso, J. Craig G. O. and Baldwin R. S. 1970. the distribution and excretion of zinc bacitracin-14c in rats and swine. *Toxicol.Appl.Pharmacol.* 17: 366-374.
- Diss** Donovan, Michael Patrick. 1980. interactions of zinc and hormones in mouse male sex accessory organs. Avail.: Univ. Microfilms Int. Order No. 8029283 From: Diss. Abstr. Int. B 1981, 41. 7. 2574. 116 pp.
- Unrel** Donovan, W. P. and Appledorf, H. 1973. protein, fat and mineral analyses of franchise chicken dinners. *Journal of Food Science* 38(1): 79-80.
- HHE** Dorea, J. G., Albuquerque, Z. P., and Borgo, L. A. 1983. hair zinc levels in normal and

malnourished infants. *Journal Of Tropical Pediatrics* 29(1): 58-60.

- Nut def** Dorea, J. G. and Olson, J. A. 1986. the rate of rhodopsin regeneration in the bleached eyes of zinc-deficient rats in the dark. *Journal of Nutrition* 116(1): 121-7.
- Bio Acc** Dorea, J. G. and Pereira, S. E. 1983. the influence of hair color on the concentration of zinc and copper in boys hair. *Journal Of Nutrition* 113(11): 2375-2381.
- Nut def** Dorea, Jose Garrofe and Olson, James Allen. the rate of rhodopsin regeneration in the bleached eyes of zinc-deficient rats in the dark. *J. Nutr. (1986)* 116(1): 121-7.
- Rev** Doreduffy, P., Catalanotto, F., Donaldson, J. O., Ostrom, K. M., and Testa, M. A. 1983. zinc in multiple-sclerosis. *Annals Of Neurology* 14(4): 450-454.
- Biom** dos Santos, E. A., Yamaguishi, G. A., and Heimann, J. C. 1998. effect of the heme/heme oxygenase pathway on the relationship between salt consumption and blood pressure. *Journal of Hypertension* 16(12 Pt 2): 1965-9.
- Mineral** Dos Santos, Maria W., Campos, Egladson Joao, and Ferreira, Maria O. O. genetic x nutrition interaction: iv. calcium level effects on blood alkaline phosphatase, calcium, magnesium and zinc of commercial laying hens. *Arq. Esc. Vet. Univ. Fed. Minas Gerais* (1978): 30(1), 75-80
- No COC** Dostal, L. A., Chapin, R. E., Stefanski, S. A., Harris, M. W., and Schwetz, B. A. 1988. testicular toxicity and reduced sertoli cell numbers in neonatal rats by di(2-ethylhexyl)phthalate and the recovery of fertility as adults. *Toxicology and Applied Pharmacology* 95(1): 104-21.
- Phys** Douvas, A., Lambie, P. B., Turman, M. A., Nitahara, K. S., and Hammond, L. 1991. negative regulation of scl-70/topoisomerase i by zinc and an endogenous macromolecule. *Biochemical and Biophysical Research Communications* 178(1): 414-21.
- Nut def** Dowd, P. S., Kelleher, J., and Guillou, P. J. 1986. t-lymphocyte subsets and interleukin-2 production in zinc-deficient rats. *The British Journal Of Nutrition.* 55(1): 59-69.
- No COC** Dowdy, Richard P. and Nielsen, Forest H. effect of histidine, histamine, and aspirin on sulfur-35 metabolism in zinc-deficient chick bone. *J. Nutr. (1972)* 102(4): 529-34.
- Org Met** Downs, K. M(A), Macklin, K. S(A), Norton, R. A(A), and Hess, J. B(A). 1999. the effectiveness of dietary vitamin e and organic zinc complexes for reducing the incidence of cellulitis. *Poultry Science* 78(SUPPL. 1): 129.
- Rev** Doyle, J. J. 1977. effects of low levels of dietary cadmium in animals: a review. *J ENVIRON QUAL.* 6(2): p111-116.
- Rev** Doyle, J. J. 1979. toxic and essential elements in bone. a review. *J. Anim. Sci.* 49(2): 482-497.
- Rev** Doyle, J. J. and Spaulding, J. E. 1978. toxic and essential trace elements in meat - a review. *Journal of Animal Science.* 47(2): 398-419.
- In Vit** Doyle, M. J. Price M. P. and Frieden E. 1981. stabilization of amphibian and mammalian liver nuclei by zinc and other metal ions. *Comp.Biochem.Physiol.C.* 68: 115-120.
- CP** Dreosti, I. E. zinc in the central nervous system: the emerging interactions. *The Neurobiology Of Zinc : Proceedings, Symposium, Society For Neuroscience, Boston, Massachusetts, November 4-6, 1983 / Editors, C.j. Frederickson, G.a. Howell, E.j. Kasarskis.* v. 11A p. 1-25. ill.

- No Oral** Dreosti, I. E., Belling, G. B., and Record, I. R. 1979. zinc status and ethanol toxicity in rats. *Nutr. Rep. Int.* 19(6): 821-8.
- Unrel** Dreosti, I. E., Buckley, R. A., Belling, G. B., and Record, I. R. 1979. zinc and alcohol interactions in rats. *Proceedings of the Nutrition Society of Australia* 4: 139.
- Nut def** Dreosti, I. E., Grey, P. C., and Wilkins, P. J. 1972. deoxyribonucleic acid synthesis, protein synthesis and teratogenesis in zinc-deficient rats. *South African Medical Journal* 46(42): 1585-1588.
- Nut def** Dreosti, I. E. and Hurley, L. S. 1975. depressed thymidine kinase activity in zinc-deficient rat embryos. *Proceedings of the Society for Experimental Biology and Medicine* 150(1): 161-165.
- Nut def** Dreosti, I. E. and Manuel, S. J. 1986. no effect of gamma-linolenic acid supplementation on the teratogenesis and growth-retardation of zinc-deficiency in rats. *Teratology* 33: B6.
- Nut def** Dreosti, I. E., Manuel, S. J., Buckley, R. A., Fraser, F. J., and Record, I. R. the effect of late prenatal and/or early postnatal zinc deficiency on the development and some biochemical aspects of the cerebellum and hippocampus in rats. *Life Sci. (1981)* 28(19): 2133-41.
- Nut def** Dreosti, I. E., Manuel, S. J., Fraser, F. J., Buckley, R. A., and Record, I. R. 1980. aspects of zinc deficiency in the hippocampus and cerebellum of suckling rats. *Proceedings of the Nutrition Society of Australia* 5: 180.
- Nut def** Dreosti, I. E. and Record, I. R. lysosomal stability, superoxide dismutase and zinc deficiency in regenerating rat liver. *Br. J. Nutr. (1978)* 40(1): 133-7.
- Nut def** Dreosti, I. E. and Record, I. R. lysosomal stability super oxide dis mutase ec-1.15.1.1 and zinc deficiency in regenerating rat liver. *BR J NUTR. British Journal of Nutrition.* 40 (1). 1978 133-138.
- Nut def** Dreosti, I. E. and Record, I. R. superoxide dismutase (ec 1.15.1.1), zinc status and ethanol consumption in maternal and fetal rat livers. *Br. J. Nutr. (1979)* 41(2): 399-402.
- Nut def** Dreosti, I. E. and Record, I. R. superoxide dismutase (ec 1.15.1.1), zinc status and ethanol consumption in maternal and foetal rat livers (effect of dietary zinc deficiency). *British Journal Of Nutrition* Mar 1979. v. 41 (2) p. 399-402. ill.
- Abstract** DREOSTI, I. E., RECORD, I. R., COSTI, H., and MANUEL, S. J. 1911. cadmium and embryonic nutrition. *PACIFIC SCIENCE ASSOCIATION 15TH CONGRESS*
- Nut def** Dreosti, I. E., Record, I. R., and Manuel, S. J. 1980. incorporation of 3h-thymidine into dna and the activity of alkaline phosphatase in (dietary) zinc-deficient fetal rat brains. *Biological Trace Element Research.* 2 (1): 21-29.
- Nut def** DREOSTI, I. E., RECORD, I. R., and MANUEL, S. J. incorporation of 3h-thymidine into dna and the activity of alkaline phosphatase in zinc-deficient fetal rat brains. *BIOL TRACE ELEMENT RES* 2:21-29,1980
- Nut def** Dreosti, I. E., Record, I. R., and Manuel, S. J. 1985. zinc deficiency and the developing embryo. *Biological Trace Element Research* 7(2): 103-122.
- CP** Dreosti, Ivor E. zinc and brain development. *Fetal Brain Disord.: Recent Approaches Prob. Ment. Defic. [Int. Workshop] (1981)* : Meeting Date 1980, 99-117. Editor(s): Hetzel, Basil S.; Smith, Richard Michael. Publisher: Elsevier North-Holland Biomed. Press, Amsterdam, Neth..

- Nut def** Dreosti, Ivor E., Buckley, Reginald A., and Record, Ian R. the effect of ethanol on zinc and copper metabolism in rats. *Biol. Trace Elem. Res.* (1980) 2(1): 31-9
- Nut def** Dreosti, Ivor E., Buckley, Reginald A., and Record, Ian R. the teratogenic effect of zinc deficiency and accompanying feeding patterns in mice. *Nutr. Res. (N. Y.)* (1986) 6(2): 159-66
- Nut def** Dreosti, Ivor E. and Fraser, Frederick J. the effect of ethanol and/or zinc deficiency on hippocampal development in the fetal rat. *Neurol. Neurobiol.* (1984) 11B(Neurobiol. Zinc, Part B): 223-33.
- Nut def** Dreosti, Ivor E., Manuel, Susan J., Russell, Gordon J., and Buckley, Reginald A. no effect of .gamma.-linolenic acid on teratogenesis and growth retardation in zinc-deficient rats. *Nutr. Rep. Int.* (1985) 32(6): 1467-71.
- Nut def** Dreosti, Ivor E. and Partick, Eric J. zinc, ethanol, and lipid peroxidation in adult and fetal rats. *Biol. Trace Elem. Res.* (1987) 14(3): 179-91.
- Acu** Dreosti, Ivor E., Record, Ian R., Manuel, Susan J., and Buckley, Reginald A. high plasma zinc levels following oral dosing in rats and the incorporation of 3h-thymidine into deoxyribonucleic acid in rat fetuses. *Res. Commun. Chem. Pathol. Pharmacol.* (1981) 31(3): 503-13 .
- Nut def** Dreosti, Ivor E., Tao, Shyy-Hwa, and Hurley, Lucille S. plasma zinc and leukocyte changes in weanling and pregnant rats during zinc deficiency . *Proc. Soc. Exp. Biol. Med.* (1968) 128(1): 169-74
- HHE** Dresser, D. W., Hacker, A., Lovell-Badge, R., and Guerrier, D. 1995. the genes for a spliceosome protein (sap62) and the anti-mullerian hormone (amh) are contiguous. *Human Molecular Genetics* 4(9): 1613-8.
- Gene** Dressler, G. R. and Gruss, P. 1988. do multigene families regulate vertebrate development? *Trends in Genetics* 4(8): 214-219.
- Sludge** Dressler, R. L., Storm, G. L., Tzilkowski, W. M., and Sopper, W. E. 1986. heavy metals in cottontail rabbits on mined lands treated with sewage sludge. *Journal of Environmental Quality* 15(3): 278-281.
- No Oral** Drickamer, L. C. 1986. peripheral anosmia affects puberty-influencing chemosignals in mice: donors and recipients. *Physiology & Behavior* 37(5): 741-6.
- Mineral** Driessens, F. C. M., Goldberg, M., Heijligers, H. J. M., Carreau, J. P., and Verbeeck, R. M. H. gradients in the composition of enamel and dentin mineral in rat incisors. *Bull. Soc. Chim. Belg.* (1990) 99(10): 861-4.
- Nut def** Driscoll, Eric R. and Bettger, William J. the effect of dietary zinc deficiency on the lipid composition of the rat erythrocyte membrane. *Lipids* (1991) 26(6): 459-66.
- Nut def** Driscoll, Eric R. and Bettger, William J. zinc deficiency in the rat alters the lipid composition of the erythrocyte membrane triton shell. *Lipids* (1992) 27(12): 972-7.
- IMM** Droke, E. A., Gengelbach, G. P., and Spears, J. W. 1998. influence of level and source (inorganic vs organic) of zinc supplementation on immune function in growing lambs. *Asian-Australasian Journal of Animal Sciences* 11(2): 139-144.
- CP** Droke, E. A., Spears, J. W., and Armstrong, J. D. dietary zinc affects concentrations of insulin insulin-like growth factor-i and growth hormone in lambs. *75TH ANNUAL MEETING OF THE*

FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ATLANTA, GEORGIA, USA, APRIL 21-25, 1991. *FASEB (FED AM SOC EXP BIOL) J.* 5 (5). 1991. A920.

- CP** Droke, E. A., Spears, J. W., Brown, T. T. Jr, and Qureshi, M. A. influence of dietary zinc and dexamethasone on immune responses and organ weights in growing lambs. *83RD ANNUAL MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE, LARAMIE, WYOMING, USA, AUGUST 6-9, 1991. J ANIM SCI.* 69 (Suppl. 1). 1991. 546. CP.
- Unrel** Droke Elizabeth A, Spears Jerry W(A), Brown Talmage T Jr, and Qureshi Muquarrab A. 1993. influence of dietary zinc and dexamethasone on immune responses and resistance to pasteurella haemolytica challenge in growing lambs. *Nutrition Research* 13(10): 1213-1226.
- No Dose** DROUAL, R., METEYER, C. U., and GALEY, F. D. 1991. zinc toxicosis due to ingestion of a penny in a gray-headed chachalaca *ortalis-cinereiceps*. *AVIAN DIS;* 35 (4). 1991. 1007-1011. 35(4): 1007-1011.
- Phys** Drummond Grant R, Cai Hua, Davis Michael E, Ramasamy Santhini, and Harrison David G(A). 2000. transcriptional and posttranscriptional regulation of endothelial nitric oxide synthase expression by hydrogen peroxide. *Circulation Research* 86(3): 347-354.
- No Control** Du, Z., Hemken, R. W., Jackson, J. A., and Trammell, D. S. utilization of copper in copper proteinate, copper lysine, and cupric sulfate using the rat as an experimental model. *J. Anim. Sci.* (1996) 74(7): 1657-1663 .
- Food** Duarte, Renata T., Simoes, Miriam C. Carvalho, and Sgarbieri, Valdemiro Carlos. bovine blood components: fractionation, composition, and nutritive value. *J. Agric. Food Chem.* (1999) 47(1): 231-236.
- No Dose** Duband, J. L., Monier, F., Delannet, M., and Newgreen, D. 1995. epithelium-mesenchyme transition during neural crest development. *Acta Anatomica* 154(1): 63-78.
- No COC** Dubey, O. P. Awasthi A. K. and Patel R. K. 1993. damage of wheat (*triticum aestivum*) tillers by field rats (*bandicota bengalensis*, *rattus rattus*, *millardia meltada*) and their control with rodenticide baits. *Indian J.Agric.Sci.* 63(2): 127-129.
- Nut def** Dubick, M. A., Zidenberg-Cherr, S., Rucker, R. B., and Keen, C. L. 1988. superoxide dismutase activity in lung from copper- and manganese-deficient mice exposed to ozone. *Toxicology Letters* 42(2): 149-57.
- FL** Dubina, T. L., Mosulishvili, L. M., Tevzieva, T. K., and Shoniya, N. I. accumulation of zinc in the bone tissue of rats with age according to data from neutron-activation analysis. *Vestsi Akad. Navuk B. SSR Ser. Biyal. Navuk* (1974): (4), 116-17.
- FL** Dubina, T. L., Tsebrikov, V. N., Plenin, A. E., Pokrovskaya, R. V., Kirichenko, L. I., and Yasinskaya, L. N. 1976. activity of some enzymes in rat tissues following the administration of different levels of zinc. *Mater. Biokhim. Konf. Pribalt. Resp. B. SSR 5th* : Volume 1, 119-21. Editor(s): Sibul, I. K. Publisher: Akad. Nauk Est. SSR, Tallinn, USSR.
- Unrel** DuBois, R. N., McLane, M. W., Ryder, K., Lau, L. F., and Nathans, D. 1990. a growth factor-inducible nuclear protein with a novelcysteine/histidine repetitive sequence. *Journal of Biological Chemistry* 265(31): 19185-19191.
- Nut def** Duerre, J. A. and Wallwork, J. C. 1986. methionine metabolism in isolated perfused livers from rats fed on zinc-deficient and restricted diets. *The British Journal Of Nutrition.* 56(2): 395-405.

Nut def	Duerre, John A., Ford, Kathleen M., and Sandstead, Harold H. effect of zinc deficiency on protein synthesis in brain and liver of suckling rats. <i>J. Nutr.</i> (1977) 107(6): 1082-93.
Nut def	Duerre, John A. and Wallwork, James C. methionine metabolism in isolated perfused livers from rats fed on zinc-deficient and restricted diets. <i>Br. J. Nutr.</i> (1986) 56(2): 395-405.
No Org	Duffy, J. A. and Wood, G. L. 1987. concentrated aqueous-solutions and liquid hydrates of zinc-chloride - a study of their solvent behavior using intershell, charge-transfer, and d-d absorption-spectra. <i>Journal Of The Chemical Society-Dalton Transactions</i> (6): 1485-1488.
Abstract	Duffy, J. Y., Baines, D., Keen, C. L., and Daston, G. P. developmental outcome of metallothionein-null mice fed various levels of zinc during gestation. <i>Teratology</i> 1997 Jan;55(1):54
Nut def	Duffy, J. Y., Baines, D., Overmann, G. J., and Daston, G. P. adverse developmental outcome after repeated administration of alpha-hederin. <i>Teratology</i> 1996 Feb;53(2):109
Unrel	Duffy, J. Y., Overmann, G. J., Baines, D., Keen, C. L., and Daston, G. P. 1998. maternal dietary zinc deficiency decreases expression of cardiac development genes regulated by gata-4. <i>Teratology</i> 57(4-5): 199.
No COC	Duffy, Jodie Y., Baines, Donald, Overmann, Gary J., Keen, Carl L., and Daston, George P. repeated administration of .alpha.-hederin results in alterations in maternal zinc status and adverse developmental outcome in the rat. <i>Teratology</i> (1997) 56(5): 327-334.
Bio Acc	Duffy, J. H., Bingley, J. B., and Cove, L. Y. 1977. the plasma zinc concentration of nonpregnant, pregnant and parturient hereford cattle. <i>Australian Veterinary Journal</i> 53(11): 519-522.
Phys	Dumermuth, E., Sterchi, E. E., Jiang, W. P., Wolz, R. L., Bond, J. S., Flannery, A. V., and Beynon, R. J. 1991. the astacin family of metalloendopeptidases. <i>Journal of Biological Chemistry</i> 266(32): 21381-5.
Nut def	Duncan, J. R. 1984. aspartate transcarbamylase from regenerating rat liver--a zinc-activated enzyme (zinc deficiency). <i>Nutrition Research.</i> 4 (1): 93-98.
No COC	Duncan, J. R. 1974. zinc intake and growth of a transplanted hepatoma induced by "3'-methyl-4-dimethylaminoazobenzene in rats. <i>Journal Of The National Cancer Institute</i> 53(1): 277-278.
Nut def	Duncan, J. R. and Dreosti, I. E. 1973. deoxyribonucleic acid and protein synthesis in regenerating livers from zinc-deficient rats. <i>Agrochimophysics</i> 5(3): 51-55.
Nut def	Duncan, J. R. and Dreosti, I. E. a proposed site of action for zinc in dna synthesis. <i>J. Comp. Pathol.</i> (1976) 86(1): 81-5.
Carcin	Duncan, J. R., Dreosti, I. E., and Albrecht, C. F. zinc intake and growth of a transplanted hepatoma induced by 3'-methyl-4-dimethylaminoazobenzene in rats. <i>J. Nat. Cancer Inst.</i> (1974) 53(1): 277-8 .
No Oral	Duncan, J. R. and Hurley, L. S. intestinal absorption of zinc: a role for a zinc-binding ligand in milk. E556-E559 .
Nut def	Duncan, John R. and Hurley, Lucille S. an interaction between zinc and vitamin a in pregnant and fetal rats. <i>J. Nutr.</i> (1978) 108(9): 1431-8.
Surv	Dundjerski, Z. outbreak of arvicola-terrestris in rice fields in yugoslavia. <i>BULL OEPP (ORGAN</i>

EUR MEDITERR PROT PLANT); 18 (3). 1988. 445-452.

- Nut def** DUNGAN, D. D., KEEN, C. L., LOENNERDAL, B., and HURLEY, L. S. effect of vitamin e supplementation on teratogenicity of zinc deficiency in rats. *FED PROC FED AM SOC EXP BIOL* 41:781,1982
- CP** Dungan, D. D., Keen, C. L., Lonnerdal, B., and Hurley, L. S. 1980. developmental-changes in concentrations of iron, copper and zinc in mouse and rat-tissues. *Federation Proceedings* 39: 903.
- No COC** Dunn, M. F., Pattison, S. E., Storm, M. C., and Quiel, E. comparison of the zinc binding domains in the 7s nerve growth factor and the zinc insulin hexamer. *Biochemistry.* 19 (4). 1980. 718-725.
- Unrel** Dunn, N. R., Winnier, G. E., Hargett, L. K., Schrick, J. J., Fogo, A. B., and Hogan, B. L. 1997. haploinsufficient phenotypes in bmp4 heterozygous null mice and modification by mutations in gli3 and alx4. *Developmental Biology* 188(2): 235-47.
- Nut def** Dura Trave, T., da Cunha Ferreira, R. M., Puig Abuli, M., Monreal, I., and Villa-Elizaga, I. 1985. zinc concentration in amniotic fluid of zinc-deficient rats and its relation to fetal weight. *Biology of the Neonate* 47(4): 230-4.
- Nut def** Dura Trave, T., Da Cunha Ferreira, R. M. C., Puig Abuli, M., Monreal, I., and Villa-Elizaga, I. zinc concentration in amniotic fluid of zinc-deficient rats and its relation to fetal weight. *Biol. Neonate* (1985) 47(4): 230-4.
- Nut def** Dura Trave, T., Puig Abuli, M., da Cunha Ferreira, R. M., and Villa Elizaga, I. 1984. effect of zinc nutrition on parturition and postpartum in the rat. *Gynecologic and Obstetric Investigation* 18(5): 275-80.
- Nut def** Dura Trave, T., Puig Abuli, M., Da Cunha Ferreira, R. M. C., and Villa Elizaga, I. effect of zinc nutrition on parturition and postpartum in the rat. *Gynecol. Obstet. Invest.* (1984) 18(5): 275-80.
- Nut def** Dura Trave, T., Puig Abuli, M., Monreal, I., and Villa Elizaga, I. plasmatic zinc concentrations during pregnancy in zinc-deficient rats in relation to neonatal outcome. *Gynecol. Obstet. Invest.* (1986) 22(3): 134-9.
- Gene** Durand, C., Charlemagne, J., and Fellah, J. S. 1999. structure and developmental expression of ikaros in the mexican axolotl. *Immunogenetics* 50(5-6): 336-43.
- Prim** Durerre, J. A., Ford, K. M., and Sandstead, H. H. 1977. effect of zinc deficiency on protein synthesis in brain and liver of suckling rats. *Journal of Nutrition* 107(6): 1082-1093.
- No COC** Durocher, D. and Nemer, M. 1998. combinatorial interactions regulating cardiac transcription. *Developmental Genetics* 22(3): 250-62.
- Nut def** Dursun, N. and Aydogan, S. comparative effects of calcium deficiency and supplements on the intestinal absorption of zinc in rats. *Jpn. J. Physiol.* (1994) 44(2): 157-66.
- Nut def** Dursun, Nurcan and Aydogan, Sami. effect of experimental zinc deficiency on carbonic anhydrase activity. *Doga: Turk Saglik Bilimleri Derg.* (1990) 14(2): 365-73.
- Nut def** Dursun, Nurcan, Erenmemisoglu, Aydin, Suer, Cem, and Gogusten, Berrin. the effect of zinc deficiency on morphine antinociception. *Res. Commun. Alcohol Subst. Abuse* (1995) Volume Date 1995, 16(1&2): 47-52.

- Meth** Dutta, Pratima and Majumder, Gopal C. purification and characterization of rat epididymal neutral .beta.-galactosidase and its changes during in vivo development. *Biochem. Cell Biol.* (1993) 71(1-2): 22-6.
- Abstract** Dvergsten, C., Fosmire, G. J., Sandstead, H. H., and Ollerich, D. A. altered basket and stellate cell development in the cerebellum due to a post natal zinc deficiency. *92ND MEETING OF THE AMERICAN ASSOCIATION OF ANATOMISTS, MIAMI, FLA., USA, APR. 2-5, 1979. ANAT REC.* 193 (3). 1979. 529.
- CP** Dvergsten, C. L. retarded synaptogenesis and differentiation of cerebellar neurons in zinc-deficient rats. *The Neurobiology Of Zinc : Proceedings, Symposium, Society For Neuroscience, Boston, Massachusetts, November 4-6, 1983 / Editors, C.j. Frederickson, G.a. Howell, E.j. Kasarskis.* v. 11B p. 17-31. ill.
- Nut def** Dvergsten, C. L., Fosmire, G. J., Ollerich, D. A., and Sandstead, H. H. alterations in the post natal development of the cerebellar cortex due to zinc deficiency 1. impaired acquisition of granule cells. *BRAIN RES. Brain Research.* 271 (2). 1983. 217-226.
- Abstract** Dvergsten, C. L., Fosmire, G. J., and Sandstead, H. H. effects of post natal zinc deficiency on the development of purkinje cell dendrites. *ANAT REC. Anatomical Record.* 190 (2). 1978 388
- Nut def** Dvergsten, Christopher L., Fosmire, Gary J., Ollerich, Dwayne A., and Sandstead, Harold H. alterations in the postnatal development of the cerebellar cortex due to zinc deficiency. ii. impaired maturation of purkinje cells. *Dev. Brain Res.* (1984) 16(1): 11-20.
- Nut def** Dvergsten, Christopher L., Fosmire, Gary J., Ollerich, Dwayne A., and Sandstead, Harold H. alterations in the postnatal development of the cerebellar cortex due to zinc deficiency. i. impaired acquisition of granule cells. *Brain Res.* (1983) 271(2): 217-26.
- Nut def** Dvergsten, Christopher L., Johnson, Lu Ann, and Sandstead, Harold H. alterations in the postnatal development of the cerebellar cortex due to zinc deficiency. iii. impaired dendritic differentiation of basket and stellate cells. *Dev. Brain Res.* (1984) 16(1): 21-6.
- Diss** Dvergsten, Christopher Lee. 1981. alterations in cerebellar basket, stellate and purkinje cell dendritic development produced by zinc deficiency in the suckling rat. *Avail.: Univ. Microfilms Int. Order No. 8120377 From: Diss. Abstr. Int. B 1981, 42. 4. 1265-6. 136 pp.*
- Alt** Dvorak, M. 1983 . effects of starvation and zinc intake on vitamin a and e levels in the blood plasma of piglets. *Acta Veterinaria Brno* 52(1/2): 49-57.
- FL** Dvorak, R., Dvorak, J., Vrba, Z., and Illek, J. 1980. effect of rumensin on mineral metabolism and nutrient conversion in fattening cattle. *Veterinarni Medicina* 25(11): 641-652.
- FL** Dvorkin, L. B. and Karasev, N. F. 1977. immuno-morphological changes during experimental cysticerciasis in lambs. *<Document Title>Materialy VI Vsesoyuznoi Konferentsii Popatologicheskoi Anatomii Zhivotnykh. Tom II.* 214-218.
- Drug** Dwivedi, Rama S. Northwestern University Medical School Chicago IL. lead exposure alters the drug metabolic activity and the homeostasis of. *Environ Pollut.* V94, N1, P61(6)
- FL** Dyachenko, L. I. synthesis of vitamin b12 by chicks under the influence of the trace element zinc . *Visn. Sil's'Kogospod. Nauki* (1967) 10(9): 102-3 .
- CP** Dyck, R. H. and O'leary, D. D. M. 1995. origin and ontogeny of zinc-ergic inputs to rat somatosensory cortex. *Society for Neuroscience Abstracts* 21(1-3): 571.

- CP** Dyck, R. H., Ruff, N. L., and O'leary, D. D. M. 1994. dynamic patterns in columnar distribution of synaptic zinc in developing rat somatosensory cortex. *Society for Neuroscience Abstracts* 20(1-2): 1383.
- Bio Acc** Dyck, Richard, Beaulieu, Clermont, and Cynader, Max. histochemical localization of synaptic zinc in the developing cat visual cortex. *J. Comp. Neurol.* (1993) 329(1): 53-67.
- CP** Dyck Richard H, Chaudhuri Avi, and Cynader Max S. 1993. zinc columns in primary visual cortex of adult vervet monkeys: topographic distribution and effects of monocular impluse blockade. *Society for Neuroscience Abstracts* 19(1-3): 1799.
- Unrel** Dydyk, L. and Juraniec, J. 1980. development of synapses in rabbit motor cortex studied with the zinc-iodide-osmium tetroxide method. *Acta Medica Polona* 21(4): 321-2.
- FL** Dydyk, L. and Justyna, M. 1981. [effect of enflurane on the motor cortex synapses in rabbits during the developmental period. electron-microscopic studies by the routine method and after impregnation with zio]. <original> wpływ enfluranu na synapsy w korze ruchowej krolika w okresie rozwoju. badania mikroskopowo-elektronowe metoda rutynowa i po impregnacji zop. *Neuropatologia Polska* 19(2): 175-87.
- Nut def** Dylewski, Daniel P., Lytton, Fiona D. C., and Bunce, G. E. dietary zinc and parturition in the rat . ii. myometrial gap junctions. *Biol. Trace Elem. Res.* (1986) 9(3): 165-75.
- FL** Dymecki, J., Karwacka, H., and Walski, M. 1977. [dynamics of synaptic changes in experimental audiogenic epilepsy]. <original> dynamika zmian w synapsach w przebiegu doswiadczalnej padaczki audiogennej. *Neurologia i Neurochirurgia Polska* 11(1): 81-8.
- FL** Dziaba, K., Kita, J., Anusz, K., Kowalski, B., Kozłowska, I., and Krupa, J. the level of macroelements and microelements in the serum of healthy and diseased european bison. *MED WETER. Medycyna Weterynaryjna.* 47 (3). 1991. 110-112.
- Unrel** Dzingeski Greg D and Wolfenden Richard(A). 1993. hypersensitivity of an enzyme reaction to solvent water. *Biochemistry* 32(35): 9143-9147.
- FL** DZUKAEV, Z. E. and KOCHETKOVA, T. A. experimental study of zinc-induced pneumoconiosis and its roentgenomorphological picture. *GIG TR PROF ZABOL; 14 (10).* 1970 38-41
- Alt** Earnhardt, J. N., Qian, M., Tu, C., Laipis, P. J., and Silverman, D. N. 1998. intramolecular proton transfer from multiple sites in catalysis by murine carbonic anhydrase v. *Biochemistry* 37(20): 7649-55.
- No Oral** Ebadi, M. biochemical alteration of a metallothionein-like protein in developing rat brain. *Biol. Trace Elem. Res.* (1986) : 11, 117-28 .
- Fate** Ebadi, M. and Babin, D. 1989. the amino-acid composition of the zinc-induced metallothionein isoforms in rat-brain. *Neurochemical Research* 14(1): 69-73.
- Nut def** Ebadi, M. and Hama, Y. 1986. zinc-binding proteins in the brain. *Advances in Experimental Medicine and Biology* 203: 557-70.
- CP** Ebadi, M., Paliwal, V. K., Takahashi, T., and Iversen, P. L. zinc metallothionein in mammalian brains. *HAMER, D. H. AND D. R. WINGE (ED.). UCLA (UNIVERSITY OF CALIFORNIA-LOS ANGELES) SYMPOSIA ON MOLECULAR AND CELLULAR BIOLOGY NEW SERIES, VOL. 98. METAL ION HOMEOSTASIS: MOLECULAR BIOLOGY AND CHEMISTRY; FRISCO,*

COLORADO, USA, APRIL 10-16, 1988. XIX+490P. ALAN R. LISS, INC.: NEW YORK, NEW YORK, USA. ILLUS. ISBN 0-8451-2697-0. 0 (0). 1989. 257-268.

- Nut def** Ebadi, M. and Wallwork, J. C. zinc-binding proteins (ligands) in brains of severely zinc-deficient rats. *Biological Trace Element Research*. May 1985. v. 7 (3) p. 129-139. ill.
- Nut def** Eberhardt, Marilou J. and Halas, Edward S. developmental delays in offspring of rats undernourished or zinc deprived during lactation. *Physiol. Behav.* (1987) 41(4): 309-14.
- Nut def** Eberle, J., Schmidmayer, S., Erben, R. G., Stangassinger, M., and Roth, H.-P. skeletal effects of zinc deficiency in growing rats. *J. Trace Elem. Med. Biol.* (1999) 13(1-2): 21-26.
- FL** Ebert, K. Institut fuer Biotechnologie Potsdam Germany, Roschke, M., and Henniger, E. 1991. amount of excrements and nutrients occurring in dairy cattle and pig houses - essential parameters for the ecologically tolerable agricultural use. <original> exkrement- und naehrstoffanfall in milchvieh- und schweineanlagen - wesentliche parameter fuer die umweltgerechte landwirtschaftliche verwertung. environmental aspects of animal production. <original> umweltaspekte der tierproduktion. P. 57-68. No. 33
- CP** Ebesh Osama, Barone Anthony, Harper Rita G, and Wapnir Raul A. 1997. maternal high zinc diet effects on placental transport of copper and iron in the rat. *Pediatrics* 100(3 PART 2): 503.
- Mix** Ecelbarger, Carolyn A. and Greger, J. L. dietary citrate and kidney function affect aluminum, zinc and iron utilization in rats. *J. Nutr.* (1991) 121(11): 1755-62 .
- Nut def** Eckhert, C. D. and Hurley, L. S. 1976. fetal brain-development in zinc-deficient rats. *Federation Proceedings* 35: 658.
- Nut def** Eckhert, Curtis D. and Hurley, Lucille S. influence of various levels of hypervitaminosis a and zinc deficiency on teratogenesis and dna synthesis in the rat. *Teratology* (1979) 19(3): 279-84.
- Nut def** Eckhert, Curtis D. and Hurley, Lucille S. reduced dna synthesis in zinc deficiency: regional differences in embryonic rats. *J. Nutr.* (1977) 107(5): 855-61
- FL** Eder, K., Hartmann, S., and Kirchgessner, M. Technische Univ. Muenchen Freising Germany Inst. fuer Ernaehrungsphysiologie. 1995. the effect of zinc deficiency on fatty acid composition of various tissues in the growing pig. <original> zum einfluss von zinkmangel auf die fettsaeurezusammensetzung verschiedener gewebe beim schwein. *Agribiological Research*. V. 48(1) P. 1-13
- Nut def** Eder, K. and Kirchgessner, K. zinc deficiency and concentrations of lipids in plasma and lipoproteins of rats force-fed a diet with linseed oil. *Trace Elem. Electrolytes* (1994) 11(2): 92-5
- Nut def** Eder, K. and Kirchgessner, M. dietary zinc deficiency and fatty acid metabolism in rats. *Nutr. Res. (N. Y.)* (1996) 16(7): 1179-1189.
- Nut def** Eder, K. and Kirchgessner, M. the effect of isolated zinc deficiency on parameters of lipid and protein metabolism in rats fed a diet with coconut oil or fish oil. *Trace Elem. Electrolytes* (1994) 11(2): 55-60.
- Nut def** Eder, K. and Kirchgessner, M. the effect of zinc deficiency on erythrocyte membrane lipids of force-fed rats receiving a diet containing coconut oil or fish oil. *J. Trace Elem. Electrolytes*

Health Dis. (1994) 8(2): 63-73.

- Nut def** Eder, K. and Kirchgessner, M. the effect of zinc deficiency on fat content and fatty acid composition of liver and brain of force fed rats. *Z. Ernaehrungswiss. (1993) 32(3): 187-97.*
- Nut def** Eder, K. and Kirchgessner, M. effect of zinc deficiency on heart and brain lipids in force-fed rats receiving either a coconut oil or a fish oil diet. *Z. Ernaehrungswiss. (1994) 33(2): 136-45*
- Nut def** Eder, K. and Kirchgessner, M. 1994. [the effect of zinc deficiency on heart and brain lipids in rats force-fed with coconut oil or fish oil diets]. <original> zum einfluss von zinkmangel auf die lipide von herz und gehirn bei zwangsernahrten ratten mit kokosfett- oder fischoldiat. *Zeitschrift Fur Ernahrungswissenschaft 33(2): 136-45.*
- Nut def** Eder, K. and Kirchgessner, M. influence of zinc deficiency on the contents of individual phospholipids and their fatty acid compositions in erythrocyte membranes of forced-fed rats. *J. Anim. Physiol. Anim. Nutr. (1993) 69(2-3): 79-91.*
- Nut def** Eder, K. and Kirchgessner, M. zinc deficiency and the concentrations of thyroid hormones in serum of force-fed rats. *J. Anim. Physiol. Anim. Nutr. (1996) 75(4/5): 271-278.*
- Nut def** Eder, K. and Kirchgessner, M. zinc deficiency and vitamin e status in rats fed olive oil or linseed oil. *J. Anim. Physiol. Anim. Nutr. (1997) 77(3): 117-126*
- Nut def** Eder, K., Kirchgessner, M., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. the effect of zinc deficiency on erythrocyte membrane phospholipids of force-fed rats. 149-152.
- Nut def** Eder, K. and Kirchgessner M(A). 1996. effects of zinc deficiency on concentrations of lipids in liver and plasma of rats. *Trace Elements and Electrolytes 13(2): 60-65.*
- Nut def** Eder, K., Waldhauser, K., and Kirchgessner, M. the activity of hepatic phospholipase a2 in zinc-deficient rats. *Trace Elem. Electrolytes (1998) 15(4): 185-189.*
- FL** Eder, K., Waldhauser, K., and Kirchgessner, M. 1999. hepatic activity of 3-hydroxy-3-methylglutaryl-coa reductase in rats with alimentary zinc deficiency. *Journal of Animal Physiology and Animal Nutrition 81(2): 68-74.*
- FL** Eder, K., Wild, S. I., and Kirchgessner M(A). 2000. zinc deficiency and activities of enzymes involved in lipogenesis and lipolysis in rats fed diets with coconut oil or fish oil. *Journal of Animal Physiology and Animal Nutrition 83(2): 65-73.*
- Nut def** Eder, K. Technische Univ. Muenchen Freising Germany Inst. fuer Ernaehrungsphysiologie, Kirchgessner, M., and Gieseke, D. ed. 1993. effect of zinc deficiency on the fat content of liver from force-fed rats. <original> einfluss von zinkmangel auf den fettgehalt der leber bei zwangsernahrten ratten. proceedings of the society of nutrition physiology. <original> berichte der gesellschaft fuer ernahrungsphysiologie. P. 99. V. 1
- Mix** Eder, Klaus and Kirchgessner, Manfred. activities of liver microsomal fatty acid desaturases in zinc-deficient rats force-fed diets with a coconut oil/safflower oil mixture of linseed oil. *Biol. Trace Elem. Res. (1995) 48(3): 215-29.*
- Nut def** Eder, Klaus and Kirchgessner, Manfred. concentrations of lipids in plasma and lipoproteins and oxidative susceptibility of low-density lipoproteins in zinc-deficient rats fed linseed oil or olive oil. *J. Nutr. Biochem. (1997) 8(8): 461-468.*
- Nut def** Eder, Klaus and Kirchgessner, Manfred. dietary fat influences the effect of zinc deficiency on

- liver lipids and fatty acids in rats force-fed equal quantities of diet. *J. Nutr.* (1994) 124(10): 1917-26.
- Nut def** Eder, Klaus and Kirchgessner, Manfred. the effect of dietary fat on activities of lipogenic enzymes in liver and adipose tissue of zinc-adequate and zinc-deficient rats. *J. Nutr. Biochem.* (1996) 7(4): 190-5.
- Nut def** Eder, Klaus and Kirchgessner, Manfred. 1997. the effect of zinc deficiency on regulation of hepatic lipogenic enzymes by dietary polyunsaturated fatty acids in rats. *Trace Elem. Man Anim.--9 Proc. Int. Symp., 9th* : Meeting Date 1996, 641-642. Editor(s): Fischer, Peter W. F. Publisher: National Research Council of Canada, Ottawa, Ont.
- Nut def** Eder, Klaus and Kirchgessner, Manfred. levels of polyunsaturated fatty acids in tissues from zinc-deficient rats fed a linseed oil diet. *Lipids* (1994) 29(12): 839-44 .
- Nut def** Eder, Klaus and Kirchgessner, Manfred. zinc deficiency and activities of lipogenic and glycolytic enzymes in liver of rats fed coconut oil or linseed oil. *Lipids* (1995) 30(1): 63-9.
- Nut def** Eder, Klaus and Kirchgessner, Manfred. zinc deficiency and the desaturation of linoleic acid in rats force-fed fat-free diets. *Biol. Trace Elem. Res.* (1996) 54(2): 173-183.
- Drug** Edgar, S. A. and Flanagan, C. 1979. efficacy of stenorol (halofuginone). ii. plus roxarsone or bacitracin md against selected strains of chicken eimeria. *Poultry Science* 58(6): 1476-82.
- CP** <Editors> Edney, A. T. B. 1989. skin disease in the dog and cat. proceedings of a symposium held atlanwades hall, newmarket, november 6-8, 1987. *Journal of Small Animal Practice* 30(4): 207-262.
- Abstract** <Editors> Lebas, F. 1999. abstracts of the communications presented during the 8th french rabbitdays paris, june 9-10, 1999. *World Rabbit Science* 7(Special issue): 35 pp.
- CP** <Editors> Phillips, M. and Baetz, A. 1981. diet and resistance to disease. proceedings of a symposium held at theamerican chemical society agricultural and food division meeting heldmarch 26, 1980, in houston, texas. vii + 220pp.
- Nut** Edrees, Gamal M. F., Othman, A. B., and Amer, M. A. influence of zinc supplementation and soybean feeding in controlling some diabetic disorders. *Egypt. J. Food Sci.* (1991) 19(1-2): 217-24.
- Abstract** Edwards, C. H., Adkins, J. S., and Harrison, B. effect of excess dietary iron as ferrous sulfate and excess dietary ascorbic-acid on liver zinc copper and sulfhydryl groups and the ovary. *70TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 13-18, 1986. FED PROC.* 45 (4). 1986. 977.
- Mix** Edwards, H. M. 1987. effects of thiuram disulfiram and a trace element mixture on the incidence of tibial dyschondroplasia in chickens. *Journal of Nutrition.* 117(5): 964-969.
- Nut** Edwards, H. M. 3rd, Boling, S. D., Emmert, J. L., and Baker, D. H. 1998. bioavailability of zinc in two zinc sulfate by-products of the galvanizing industry. *Poultry Science* 77(10): 1546-9.
- Acu** Edwards, H. M. Jr. 1966. the effect of protein source in the diet on zn absorption and excretion by chickens. *Poultry Science* 45(2): 421-2.
- Nut def** Edwards, Hardy M. III and Baker, David H. bioavailability of zinc in several sources of zinc

oxide, zinc sulfate, and zinc metal. *J. Anim. Sci. (Savoy Ill.)* (1999): 77(10), 2730-2735

- CP** Edwards, M., Kulas, J. E., Weakley, J. O., Kuit, W. J., Bloom, N. S., and Wallschlager, D. 1999. aquatic selenium at cominco's red dog mine: sources, speciation, distribution, and control. *Tailings Mine Waste '99 Proc. Int. Conf., 6th* : 535-542 Publisher: Balkema, Rotterdam, Neth..
- Unrel** Edwards, P. G., Kendall, M. D., and Morris, I. W. effect of a platinum chemotherapy drug on intracellular elements during the cell cycle using x-ray microanalysis. *SCANNING MICROSC. Scanning Microscopy.* 5 (3). 1991. 797-810.
- Bio Acc** Eens, Marcel, Pinxten, Rianne, Verheyen, Rudolf F., Blust, Ronny, and Bervoets, Lieven. great and blue tits as indicators of heavy metal contamination in terrestrial ecosystems. *Ecotoxicol. Environ. Saf.* (1999) 44(1): 81-85.
- Air P** Eeva, T. and Lehtikoinen, E. 1998. local survival rates of the pied flycatchers (*fijcedula hypoleuca*) and the great tits (*parus major*) in an air pollution gradient. *ECOSCIENCE.* 5(1): 46-50.
- Alt** Egger, B., Carey, H. V., Procaccino, F., Chai, N. N., Sandgren, E. P., Lakshmanan, J., Buslon, V. S., French, S. W., Buchler, M. W., and Eysselein, V. E. 1998. reduced susceptibility of mice overexpressing transforming growth factor alpha to dextran sodium sulphate induced colitis. *Gut* 43(1): 64-70.
- Diss** Egwuatu, C. I. 1981. physiological and nutritional interrelationships of mineral elements to growth and reproduction in turkeys. *Dissertation Abstracts International, B* 42(7): 2613.
- FL** Ehlers, J. Landwirtschaftskammer Weser-Ems Oldenburg Germany Tiergesundheitsamt, Boehnke, H. J., Scholz, H., and Lotthammer, K. H. 1992. blood sampling to estimate the trace element supply and the correlation to the fertility of milking cows. <original> blutuntersuchungen zur ermittlung der spurenelementversorgung und deren beziehung zur fruchtbarkeit bei milchrindern. *Reproduction in Domestic Animals.* V. 27(4) P. 209
- Air P** Ehrlich, R. CS IIT Research Inst. Chicago IL. *Interactions of Various Pollutants on Causation of Pulmonary Disease*
- Rev** Eik-Nes, K. B. 1975. androgen metabolism by the perfused prostate. *Vitamins and Hormones* 33: 193-207.
- FL** Eisen, E. J., Murray, J. D., and Schmitt, T. J. North Carolina State Univ. Raleigh USA Dept. of Animal Science. 1995. an ovine-growth-hormone transgene model suitable for selection experiments for growth in mice. *Journal of Animal Breeding and Genetics.* V. 112(5-6) P. 401-413
- Alt** Eisen, E. J., Peterson, C. B., Parker, I. J., and Murray, J. D. 1998. effects of zinc ion concentration on growth , fat content and reproduction in omt1a-ogh transgenic mice. *Growth Dev. Aging* 62(4): 173-186.
- CP** Eisen, E. J(A), Peterson, C. B(A), Parker, I. J(A), and Murray, J. D. 1997. zinc concentration affects growth, fat content and reproduction in omt1a-ogh transgenic mice. *Journal of Animal Science* 75(SUPPL. 1): 153.
- Fate** EKLUND, A. levels of minerals, lipoproteins and lipids in plasma, liver and tibia from female rats fed on a zinc-supplemented rapeseed (brassica napus cultivar sinus) protein diet. *NUTR METAB;* 24 (2). 1980. 91-101.

- Nut def** Eklund, A. 1980. levels of minerals, lipoproteins and lipids in plasma, liver and tibia from female rats fed on a zinc-supplemented rapeseed protein diet. *Nutrition and Metabolism* 24(2): 91-101.
- Nut** Eklund, A. and Sjoblom, L. 1980. effects of the source of dietary protein on serum lower density lipoprotein (vldl + ldl) and tocopherol levels in female rats. *Journal of Nutrition* 110(12): 2321-35.
- Nut** Eklund, Anders. levels of minerals, lipoproteins and lipids in plasma, liver and tibia from female rats fed on a zinc-supplemented rapeseed protein diet. *Nutr. Metab. (1980)* 24(2): 91-101 .
- CP** Eklund, Anders and Aagren, Gunnar. 1979. effect of dietary rapeseed protein concentrate on tissue levels of zinc, tocopherol and lipids. *Proc. Int. Rapeseed Conf. 5th* : Meeting Date 1978, Volume 2, 144-6 Publisher: Dr. Goesta Andersson, Svaloev, Swed..
- No COC** Eklund, Anders and Agren, Gunnar. effect of a dietary rapeseed protein concentrate on the contents of .alpha.-tocopherol and zinc in serum, liver and tibia of rats. *Nutr. Metab. (1978)* 22(4): 218-30 .
- Bio Acc** Eklund, Anders and Rask, Lars. zinc status and serum levels of retinol-binding protein, tocopherol and lower density lipoproteins in male and female rats fed on semi-purified diets containing rapeseed protein of casein. *Nutr. Metab. (1979)* 23(6): 458-66.
- FL** Ekpenyong, T. E. and Obi, A. E. replacement of maize with cassava in broiler rations. *Archiv Fuer Gefluegelkunde.* 50 (1). 1986. 2-6.
- Gene** Ekstrom, K. E., <Editors> Miller, E. R., Ullrey, D. E., and Lewis, A. J. 1991 . genetic and sex considerations in swine nutrition. <document title>swine nutrition. 415-424.
- FL** El-Bazza, Z. E., Moroz, A. F., Glatman, L. I., Samoilenko, I. I., and Terekhov, A. A. 1988. [physico-chemical and biological characteristics of pseudomonas aeruginosa elastase]. <original> nekotorye fiziko-khimicheskie i biologicheskie kharakteristiki elastazy pseudomonas aeruginosa. *Zhurnal Mikrobiologii, Epidemiologii, i Immunobiologii* (1): 3-8.
- Nut** El-Beeli, M. Y. M. and El-Zubeir, E. A. 1991. feeding whole-grain sorghum (feteraitea) as a resting agent in egg-typebreeder hens. *Sudan Journal of Animal Production* 4(2): 121-131.
- Phys** El-Darawany, A. A. high and low litter size trait and its relationship with serum and urine progesterone, serum zinc, and serum phosphorus in new zealand white rabbits and improvement for the low litter size trait. *Beitr. Trop. Landwirtsch. Veterinaarmed. (1992)* 30(4): 451-62.
- Effl** El-Darawany, A. A., Ibrahim, Z. A., Abd-El-Razik, M. A., and SayedAhmed, A. M. M. 1994. teratogenicity of drainage water on rabbit embryos. *Egyptian Journal of Rabbit Science* 4(1): 61-68.
- Nut** El-Ekhnawy, K. E., Otteifa, A. M., Ezzo, O. H., and Hegazy, M. A. 1999. post-weaning reproductive activity of barki ewes lambing in spring fed nigella sativa oil seed meal. *Assiut Veterinary Medical Journal* 40(80): 292-309.
- Bio Acc** El-Feel, F. M., Ibrahim, F. S., Rabie, Z. B. H., and El-Sayed, A. M. A. A. 1995. trace elements and milk composition of cows fed on poultry manure. *Egyptian Journal of Dairy Science* 23(1): 87-99.
- Nut def** el-Hag, H. M., MacDonald, D. C., Fenwick, P., Aggett, P. J., and Wakelin, D. 1989. kinetics of nipprostrongylus brasiliensis infection in the zinc-deficient rat. *Journal of Nutrition* 119(10):

1506-12.

- Nut def** El-Hag, H. M. A., MacDonald, D. C., and Aggett, P. J. 1989. the lymphocyte response of zinc-deficient rats to sheep red blood cells and nippostrongylus brasiliensis antigens. *Nutrition Reports International* 40(6): 1217-1225.
- Nut def** El-Hag, Hassan M. A., Macdonald, Donald C., and Aggett, Peter J. the lymphocyte response of zinc-deficient rats to sheep red blood cells and nippostrongylus brasiliensis antigens. *Nutr. Rep. Int.* (1989) 40(6): 1217-26.
- Nut def** El-Hag, Hassan M. A., MacDonald, Donald C., Fenwick, Paul, Aggett, Peter J., and Wakelin, Derek. kinetics of nippostrongylus brasiliensis infection in the zinc-deficient rat. *J. Nutr.* (1989) 119(10): 1506-12.
- Nut** El-Husseiny, O. Cairo Univ. Egypt Faculty of Agriculture, Eissa, A. I., and Hashish, S. 1982. calcium and zinc requirements and their interaction [effect of their levels in the diet on the changes that might occur in serum and liver cholesterol and alkaline phosphatase activity in rats]. *Annals of Agricultural Science, Moshtohor*. V. 17 P. 139-150
- FL** El-Katcha, M. I., Sharaf, M. M., Mandour, M. A., and Abd-El-Hamid, H. S. Alexandria Univ. Egypt Faculty of Veterinary Medicine. 1991. influences of breed and dietary supplementation of methionine, copper and zinc on broiler performance. *Benha Veterinary Medical Journal*. V. 2(2) P. 7-20
- Nut def** El-Malkh, N. M. and El-Zayat, E. M. I. histopathological changes induced by dietary zinc deficiency in testes of male albino rats. *Bulletin of the Faculty of Science Cairo University*. 57 (1). 1989. 141-156.
- Nut** El-Masry, K. A., Nasr, A. S., and Kamal, T. H. 1994. influences of season and dietary supplementation with selenium and vitamin e or zinc on some blood constituents and semen quality of newzealand white rabbit males. *World Rabbit Science* 2(3): 79-86.
- CP** El-Masry, K. A., Youssef, H. M., <Editors> Abdel-Samee, A. M., Marai, I. F. M., and Metwally, M. K. 1998. effects of supplemental zn and vitamin a on some blood biochemical and immune indices related to growth performance in growing calves. <document title>first international conference on animal production and health in semi-arid areas, el arish, egypt, 1-3 september, 1998. 139-151.
- Phys** El-Missiry Mohammed A(A). 1999. enhanced testicular antioxidant system by ascorbic acid in alloxan diabetic rats. *Comparative Biochemistry and Physiology C Pharmacology Toxicology & Endocrinology* 124(3): 233-237.
- Diss** El-Nagmy, K. Y. A. 1989. effect of falmomycin or zinc bacitracin supplements on performance of broiler chicks fed diets varying in protein and energy contents [egypt]. 126 P.
- CP** El-Sheikh, A. R., Samy, H. M., and El-Sherbiny, M. 1995. role of diet supplemented with bospro on alopecia, milk production and ovarian inactivity in buffaloes. <document title>proceedings of the third scientific congress egyptian society for cattle diseases, volume 2. 3-5 december 1995 assiut - egypt. 222-226.
- FL** El-Shobaki, F. A. and Srour, M. G. the influence of ascorbic acid and lactose on the interaction of iron with each of cobalt and zinc during intestinal absorption. *Zeitschrift Fuer Ernaehrungswissenschaft*. 28 (4). 1989. 310-315.
- Mix** El-Waseef, A. and Hashim, M. M. zinc-lead interaction in the rabbit. *Acta Med. Hung.* (1985)

42(3-4): 199-207.

- No Oral** Elaroussi, Mahmoud A. and DeLuca, Hector F. a new member to the astacin family of metalloendopeptidases: a novel 1,25-dihydroxyvitamin d-3-stimulated mrna from chorioallantoic membrane of quail. *Biochim. Biophys. Acta* (1994) 1217(1): 1-8.
- CP** Eldeeb, M. A., Soares, J. H. Jr, and Johnson, E. skeletal development and performance of broilers fed various levels of copper and zinc. *75TH ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC. POULT SCI.* 65 (Suppl. 1). 1986. 38.
- No COC** Elfadil, A. A., Vaillancourt, J. P., and Meek, A. H. 1996. farm management risk factors associated with cellulitis in broiler chickens in southern ontario. *Avian Diseases.* 40(3): 699-706.
- HHE** Elgasim, E. A. and Alkanhal, M. A. proximate composition, amino acids and inorganic mineral content of arabian camel meat: comparative study. *Food Chem.* (1992) 45(1): 1-4 .
- Anat** Elkerdany, M. K. and Fahim, M. A. 1993. age changes in neuromuscular junctions of masseter muscle. *Anatomical Record* 237(2): 291-5.
- Bio Acc** Elliott, N. G., Ritz, D. A., and Swain, R. 1985. interaction between copper and zinc accumulation in the barnacle elminius-modestus darwin. *Marine Environmental Research* 17(1): 13-17.
- Nut** Ellis, R. and Morris, E. R. relation between phytic acid and trace metals in wheat bran and soybean. *Cereal Chem.* (1981) 58(5): 367-70 .
- Mix** Ellis, R., Morris, E. R., and Hill, A. D. bioavailability to rats of iron and zinc in calcium-iron-phytate and calcium-zinc-phytate complexes. *Nutr. Res. (N. Y.)* (1982) 2(3): 319-22.
- Abstract** Ellis, R. and Morris, E. R. CS Nutrition Inst. USDA Beltsville MD. low-phytate wheat bran as dietary source of iron and zinc for rats. (3): p. 585.
- Nut def** ELLISON, A. C. and MAREN, T. H. effects of metabolic alterations on teratogenesis. *JOHNS HOPKINS MED J* 130:87-94,1972
- Alt** Elmer, G. I(A), Evans, J. L., Goldberg, S. R., Epstein, C. J., and Cadet, J. L. 1996. transgenic superoxide dismutase mice: increased mesolimbic mu-opioid receptors results in greater opioid-induced stimulation and opioid-reinforced behavior. *Behavioural Pharmacology* 7(7): 628-639.
- HHE** Elmes, M. E., Clarkson, J. P., and Jasani, B. 1987. histological demonstration of immunoreactive metallothionein in rat and human tissues. *EXS* 52: 533-7.
- HHE** Elmes M.E., Clarkson J.P., and Jasani, B. 1985. histological demonstration of immunoreactive metallothionein in sections of human and rat tissue. *ENVIRON. GEOCHEM. HEALTH* VOL. 7, NO. 4: pp. 127-130.
- Nut def** Elmes, M. E. and Jones, J. G. 1980. ultrastructural changes in the small intestine of zinc deficient rats. *Journal of Pathology* 130(1): 37-43.
- Nut def** Elmes, M. E. and Jones, J. G. 1980. ultrastructural studies on paneth cell apoptosis in zinc deficient rats. *Cell and Tissue Research* 208(1): 57-63.
- Nut def** Elmes, Margaret E. microscopic studies on the small intestine of zinc deficient rats. *Trace Subst. Environ. Health* (1973) : 7, 267-70.

- CP** Elmes, Margaret E. 1974. zinc in the rat paneth cell. *Trace Elem. Metab. Anim. Proc. Int. Symp., 2nd* : Meeting Date 1973, 538-40. Editor(s): Hoekstra, W. G. Publisher: Univ. Park Press, Baltimore, Md.
- FL** Elnour, A., Lieden, S.-A., Bourdoux, P., Eltom, M., Khalid, S. A., and Hambraeus, L. traditional fermentation increases goitrogenic activity in pearl millet. *Ann. Nutr. Metab. (1998)* 42(6): 341-349.
- Bio Acc** Elsaiee, L., Abdelaal, H., Elmahdy, H., and Abdelaal, A. M. 1983. serum copper, iron and zinc in cases of acne-vulgaris. *Journal Of Medicine* 14(2): 125-136.
- Nut def** Eltohamy, M. M. zinc deficiency during pregnancy in rabbits. *J. Egypt. Vet. Med. Assoc. (1987)* 47(1-2): 489-96.
- No Oral** Eltohamy, M. M., Takahara, H., and Okamoto, M. 1980. effects of zinc on intact and castrated cockerels. *British Poultry Science* 21(5): 363-9.
- Nut def** Eltohamy, M. M. and Younis, M. response of testes, epididymis, and seminal vesicles of rabbits to zinc deficiency. *Arch. Exp. Veterinaarmed. (1991)* 45(1): 155-60.
- Nut def** Eltohamy, M. M., Younis, M., and Elsaied, D. 1988. effects of zinc deficiency on prostaglandins and fatty acid composition of the testes of rabbits. *Animal Reproduction Science* 16(3-4): 303-309.
- No Dose** Eltohamy, M. M., Zakaria, A. D., and Taha, N. A. changes in the contents of buffalo cervical mucus during different phases of the estrous cycle. *ANIM REPROD SCI.* 22 (3). 1990. 203-212.
- Nut def** Eltohamy, Magda M. and Wasfy, M. A. effect of zinc deficiency on gonadal-pituitary-thyroid function in the cock. *Indian J. Anim. Sci. (1989)* 59(4): 457-9.
- Mineral** Eltohamy, Magda Mohammed and Takahara, Hitoshi. effects of dietary calcium levels on testicular function in the white leghorn cocks. *J. Fac. Agric. Kyushu Univ. (1985):* 30(2-3), 125-34, 1 plate.
- Mix** Eltohamy, Magda Mohammed, Takahara, Hitoshi, and Okamoto, Masao. effects of dietary zinc levels on the histological changes produced in white leghorn cockerels. *J. Fac. Agric. Kyushu Univ. (1979):* 24(1), 11-20 .
- FL** Eltohamy, Magda Mohammed, Takahara, Hitoshi, and Okamoto, Masao. effects of dietary zinc levels on zinc, iron and copper content in tissues of the white leghorn cockerels. *J. Fac. Agric. Kyushu Univ. (1979):* 24(2-3), 65-74 .
- Mix** Eltohamy, Magda Mohammed, Takahara, Hitoshi, and Okamoto, Masao. temporal effects of high dietary zinc on the histological changes produced in white leghorn cocks. *J. Fac. Agric. Kyushu Univ. (1980):* 24(4), 189-99, 6 plates .
- Org Met** Ema, M., Itami, T., Ogawa, Y., and Kawasaki, H. 1994. developmental toxicity evaluation of zinc dimethyldithiocarbamate (ziram) in rats. *Bulletin Of Environmental Contamination And Toxicology.* 53(6): 930-936.
- Nut def** Emerick, Royce J. and Kayongo-Male, Henry. interactive effects of dietary silicon, copper, and zinc in the rat. *J. Nutr. Biochem. (1990)* 1(1): 35-40
- Nut def** Emery, Michelle P., Browning, Jimmy D., and O'Dell, Boyd L. impaired hemostasis and platelet function in rats fed low zinc diets based on egg white protein. *J. Nutr. (1990)* 120(9): 1062-

71.

- Nut def** Emery, Michelle P. and O'Dell, Boyd L. low zinc status in rats impairs calcium uptake and aggregation of platelets stimulated by fluoride. *Proc. Soc. Exp. Biol. Med.* (1993) 203(4): 480-4.
- Abstract** Emmert, J. L. and Baker, D. H. 1994. zinc stores delay the onset of zinc deficiency symptoms in the chicken. *FASEB Journal* 8(4-5): A715.
- Fate** Emmert, Jason L. and Baker, David H. 1995. zinc stores in chickens delay the onset of zinc deficiency symptoms. *Poult. Sci.* 74(6): 1011-21 .
- FL** Enbergs H(A), Geist, S., and Schuh, U. 1997. status of trace elements in mares. *Tieraerztliche Umschau* 52(7): 400-404, 406.
- CP** Endo Takeshi. 1994. relationship between chromatin dna fragmentation and apoptosis during muscle cell differentiation. *Cell Structure and Function* 19(6): 541.
- In Vit** Endo Tetsuya and Shaikh Zahir A(A). 1993. cadmium uptake by primary cultures of rat renal cortical epithelial cells: influence of cell density and other metal ions. *Toxicology and Applied Pharmacology* 121(2): 203-209.
- FL** Engberg, R. M. National Institute of Animal Science Foulum Tjele Denmark Dept. of Animal Physiology and Biochemistry and Boersting, C. F. 1994. inclusion of oxidized fish oil in mink diets, 2: the influence on performance and health considering histopathological, clinical-chemical, and haematological indices. *Journal of Animal Physiology and Animal Nutrition.* V. 72(2-3) P. 146-157
- FL** Engelbart, K. and Kief, H. 1970. functional behavior of zinc and insulin contained in the pancreatic .beta.-cells of rats. *Virchows Arch.B* 4(4): 294-302.
- FL** Engelbart, K. and Kief, H. 1970. [the functional behaviour of zinc and insulin contained in the pancreatic beta-cells of rats]. <original> uber das funktionelle verhalten von zink und insulin in den beta-zellen des rattenpankreas. *Virchows Archiv. B: Cell Pathology* 4(4): 294-302.
- Nut def** Engle, T. E., Nockels, C. F., Hossner, K. L., Kimberling, C. V., Toombs, R. E., Yemm, R. S., Weaver, D. L., and Johnson, A. B. 1997. marginal zinc deficiency affects biochemical and physiological parameters in beef heifer calves. *Asian-Australasian Journal of Animal Sciences* 10(5): 471-477.
- Nut def** Engle, T. E., Nockels, C. F., Kimberling, C. V., Toombs, R. E., Hossner, K. L., Yemm, R. S., Weaver, D. L., and Johnson, A. B. 1996. physiological changes in calves during zinc deficiency and repletion with organic or inorganic forms of zinc. *FASEB Journal* 10(3): A514.
- Nut def** Engle, T. E., Nockels, C. F., Kimberling, C. V., Weaver, D. L., and Johnson, A. B. 1997. zinc repletion with organic or inorganic forms of zinc and proteinturnover in marginally zinc-deficient calves. *Journal of Animal Science* 75(11): 3074-3081.
- Nut** Engle, T. E. and J. W. Spears. 2000. dietary copper effects on lipid metabolism, performance and ruminal fermentation in finishing steers . *Journal of Animal Science.* 78: 2462-2458.
- CP** Ennulat, D. J., D'anci, K., Caine, S. B., Negus, S. S., Mello, N. K., and Cohen, B. M. 1998. regulation of the c2h2 zinc finger protein (catzip) after self-administration of cocaine. *Society for Neuroscience Abstracts* 24(1-2): 995.

- Org Met** Enomoto, A., Harada, T., Maita, K., and Shirasu, Y. 1989. epiphyseal lesions of the femur and tibia in rats following oral chronic administration of zinc dimethyldithiocarbamate (ziram). *Toxicology* 54(1): 45-58.
- Gene** Enomoto, H., Hendy, G. N., Andrews, G. K., and Clemens, T. L. 1992. regulation of avian calbindin-d sub(28k) gene expression in primary chick kidney cells: importance of posttranscriptional mechanisms and calcium ion concentration. *Vol. 130, No. 6, Pp. 3467-3474* Endocrinology.
- Nut def** Enomoto, Shuichi, Yanaga, Makoto, Hirunuma, Rieko, Endo, Kazutoyo, Ambe, Shizuko, and Ambe, Fumitoshi. metabolic and biochemical studies of trace elements in zinc-deficient rats : biochemical properties of platinum-group elements. *RIKEN Rev. (1996)* : 13, 27-28.
- Unrel** Epifanov, G. and Zakachurin, A. 1990. bioactive substances for fattening young bulls. *Molochnoe i Myasnnoe Skotovodstvo* (4): 25-26.
- Gene** Epner, D. E. and Herschman, H. R. heavy metals induce expression of the tpa-inducible sequence tis genes. *Journal of Cellular Physiology.* 148 (1). 1991. 68-74.
- Drug** Eppard, P. J., Veenhuizen, J. J., Cole, W. J., Comens-Keller, P. G., Hartnell, G. F., Hintz, R. L., Munyakazi, L., Olsson, P. K., Sorbet, R. H., White, T. C., Baile, C. A., Collier, R. J., Goff, J. P., and Horst, R. L. 1996. effect of bovine somatotropin administered to periparturient dairy cowson the incidence of metabolic disease. *Journal of Dairy Science* 79(12): 2170-2181.
- No Oral** Eppard, P. J(A), White, T. C., Sorbet, R. H., Weiser, M. G., Cole, W. J., Hartnell, G. F., Hintz, R. L., Lanza, G. M., Vicini, J. L., and Collier, R. J. 1997. effect of exogenous somatotropin on hematological variables of lactating cows and their offspring. *Journal of Dairy Science* 80(8): 1582-1591.
- Alt** Epstein, O., Spinsi, R., Woods, B., Parbhoo, S., Burroughs, A. K., and Dormandy, T. L. the effect of portasystemic shunting on liver, brain and kidney zinc concentrations in the rat. *Br. J. Exp. Pathol. (1982)* 63(2): 203-6 .
- No COC** Erbas, Deniz, Gonul, Bilge, and Guvendik, Gulin. effects of submandibular gland extracts on the serum zinc levels of cholesterol-fed mice. *Ankara Univ. Eczacilik Fak. Derg.* 17(1): 18-23 .
- Unrel** Erbas, Deniz, Gonul, Bilge, and Guvendik, Gulin. the effects of submaxillary gland extract egf on blood cholesterol, lipid, hdl-cholesterol, serum zinc and tissue cholesterol levels. *Doga: Turk Saglik Bilimleri Derg. (1990)* 14(1): 43-50.
- No Dose** Erbas, Deniz, Guvendik, Gulin, and Gonul, Bilge. 1987. effects of submandibular gland extracts on the serum zinc levels. *Ankara Univ. Eczacilik Fak. Derg.* 17(1): 11-17 .
- Unrel** Ercan, M. T. and Bor, N. M. 1991. phagocytosis by macrophages in zinc-deficient rats. *International Journal of Radiation Applications and Instrumentation. Part B, Nuclear Medicine and Biology* 18(7): 765-768.
- FL** Ercan, Z. S., Oner, G., Turker, R. K., and Bor, N. 1979. zinc deficiency and lung converting enzyme activity in rats. *Experientia* 35(2): 215-216.
- Abstract** Ercanli, F. G. and Strength, D. R. effects of zinc deficiency on dna polymerase of rat testes. *64TH ANNUAL MEETING OF THE FED. AM. SOC. EXP. BIOL., ANAHEIM, CALIF., USA, APR. 13-18, 1980. FED PROC.* 39 (3). 1980. Abstract 3314.
- Diss** Ercanli, Fatma Guelsel. 1979. effects of zinc deficiency on zinc contents, histology and dna

polymerase of selected tissues of rats. Avail.: Univ. Microfilms Int. Order No. 8009577 From: Diss. Abstr. Int. B 1980, 40. 10. 4745. 189 pp.

- No Oral** Erdman, Howard E., Mahlum, D. Dennis, and Sikov, Melvin R. age effects on zinc metabolism in the rat. *Int. J. Biochem.* (1971) 2: 2(11) .
- No Oral** Erdman, Howard E., Mahlum, D. Dennis, and Sikov, Melvin R. 1969. age-related differences in zinc metabolism in the rat. *AEC Symp. Ser. No. 17*, Avail.: CFSTI.
- CP** Erdman, J. W. 1974. effect of salt mixture upon serum and liver zinc, vitamin-a and cholesterol in rat on a hypercholesterolemic diet. *Federation Proceedings* 33: 690.
- In Vit** Erdman, J. W., Dickinson, D. B., Raboy, V., and Fordyce, E. J. 1988. effect of soil-phosphorus levels during growth upon soybean seed phytic acid and zinc bioavailability in rats. *Faseb Journal* 2: A1082.
- CP** Erdman, J. W., Forbes, R. M., and Kondo, H. 1983. zinc bioavailability from processed soybean products. *Acs Symposium Series* 210: 173-183.
- Nut def** Erdman, J. W. Jr. and Lachance, P. A. 1974. effect of salt mixture and cholesterol upon rat serum and liver zinc, vitamin a, and cholesterol. *Nutrition Reports International* 9(5): 319-329.
- Abstract** Erdman, J. W. Jr and Lachance, P. A. the effect of salt mixture upon serum and liver zinc vitamin a and cholesterol in the rat on a hyper cholesteremic diet. *FED PROC. Federation Proceedings.* 33 (3 Part 1). 1974 690
- OAC** Erdman, J. W. Jr., Weingartner, K. E., Mustakas, G. C., Schmutz, R. D., Parker, H. M., and Forbes, R. M. zinc and magnesium bioavailability from acid-precipitated and neutralized soybean protein products. *J. Food Sci.* (1980) 45(5): 1193-9 .
- Gene** Erdos, E. G. and Skidgel, R. A. 1989. neutral endopeptidase 24.11 (enkephalinase) and related regulators of peptide hormones. *FASEB Journal* 3(2): 145-51.
- HHE** Erickson, J. C., Masters, B. A., Kelly, E. J., Brinster, R. L., and Palmiter, R. D. 1995. expression of human metallothionein-iii in transgenic mice. *Vol. 27, No. 1, Pp. 35-41 Neurochem. Int.*
- No Dose** Ericsson, Johan, Runquist, Marten, Thelin, Anders, Andersson, Magnus, Chojnacki, Tadeusz, and Dallner, Gustav. distribution of prenyltransferases in rat tissues. evidence for a cytosolic all-trans-geranylgeranyl diphosphate synthase. *J. Biol. Chem.* (1993) 268(2): 832-8.
- Unrel** Eriksson, M. A., Berglund, H., Hard, T., and Nilsson, L. 1993. a comparison of 15n nmr relaxation measurements with a molecular dynamics simulation: backbone dynamics of the glucocorticoid receptor dna-binding domain. *Proteins* 17(4): 375-90.
- Nut def** Erlick, N. E., Engel, E. D., and Davis, R. H. open field loco motion by zinc deficient adult male mice. *EXPERIENTIA (Basel).* 37 (5). 1981. 481-482.
- FL** Ermenkov, K. 1986. role of cholecalciferol and vitamin b-12 in mineral metabolism ingrowing chickens. *Zhivotnov"Dni Nauki* 23(4): 57-65.
- No COC** Ernstrom, U. identification of a mammalian growth factor as a ribofolate peptide. *BIOSCI REP. Bioscience Reports.* 11 (2). 1991. 119-130.
- Bact** Erskine, R. J A and Bartlett, P. C. 1993. serum concentrations of copper, iron, and zinc during escherichia coli induced mastitis. *Journal of Dairy Science* 76(2): 408-413.

- No Oral** Erway, L. C. and Grider, A. Jr. 1984. zinc metabolism in lethal-milk mice. otolith, lactation, and aging effects. *Journal of Heredity* 75(6): 480-4.
- CP** Erway, Lawrence C. and Purichia, Nicholas A. 1974. manganese, zinc, and genes in otolith development. *Trace Elem. Metab. Anim. Proc. Int. Symp., 2nd* : Meeting Date 1973, 749-51. Editor(s): Hoekstra, W. G. Publisher: Univ. Park Press, Baltimore, Md.
- Unrel** Escames, G., Acuna-Castroviejo, D., Leon, J., and Vives, F. melatonin interaction with magnesium and zinc in the response of the striatum to sensorimotor cortical stimulation in the rat. *J. Pineal Res. (1998)* 24(2): 123-129.
- No COC** Escobar, M. L., Barea-Rodriguez, E. J., Derrick, B. E., Reyes, J. A., and Martinez, J. L. Jr. 1997. opioid receptor modulation of mossy fiber synaptogenesis: independence from long-term potentiation. *Brain Research* 751(2): 330-5.
- Phys** Escobar, Oscar, Sandoval, Manuel, Vargas, Alfonso, and Hempe, James M. role of metallothionein and cysteine-rich intestinal protein in the regulation of zinc absorption by diabetic rats. *Pediatr. Res. (1995)* 37(3): 321-7.
- Drug** Escolar, G., Camarasa, J., Navarro, C., Vernetta, C., and Bulbena, O. 1987. antiulcerogenic activity of zinc acexamate in different experimental models. *Methods and Findings in Experimental and Clinical Pharmacology* 9(7)
- Plant** Esechie, Humphrey A. distribution of chemical constituents in the plant parts of six tropical-origin forage grasses at early anthesis. *J. Sci. Food Agric. (1992)* 58(3): 435-8.
- Nut def** Essatara, M., Morley, J. E., Levine, A. S., Elson, M. K., Shafer, R. B., and McClain, C. J. 1984. the role of the endogenous opiates in zinc deficiency anorexia. *Physiology and Behavior* 32(3): 475-478.
- Nut def** Essatara, M'B., Levine, A. S., Morley, J. E., and McClain, C. J. zinc deficiency and anorexia in rats : normal feeding patterns and stress induced feeding. *Physiol. Behav. (1984)* 32(3): 469-74.
- Abstract** Essatara, M. B., McClain, C. J., Levine, A. S., Elson, M. K., Shafer, R. B., and Morley, J. E. is zinc deficiency anorexia mediated through the endogenous opiates? *39TH ANNUAL NATIONAL MEETING OF THE AMERICAN FEDERATION FOR CLINICAL RESEARCH, WASHINGTON, D.C., USA, MAY 7-10, 1982. CLIN RES.* 30 (2). 1982. 244a.
- Nut def** Essatara, M. B., McClain, C. J., Levine, A. S., and Morley, J. E. 1984. zinc-deficiency and anorexia in rats - the effect of central administration of norepinephrine, muscimol and bromerogocryptine. *Physiology & Behavior* 32(3): 479-482.
- Unrel** Essig, T. H. 1967. *Environmental Status of the Hanford Reservation for January-February 1967.* BNWL-CC-1197-1
- Unrel** Essig, T. H. 1967. *Environmental Status of the Hanford Reservation for March-April 1967.* BNWL-CC-1197-2
- Unrel** Essig, T. H. and Hall, R. B. 1966. *Environmental Status of the Hanford Project. 1965 Annual Summary*
- No COC** Esther Charles R Jr, Marino Elaine M, and Bernstein Kenneth E. 1997. the role of angiotensin-converting enzyme in blood pressure control, renal function, and male fertility. *Trends in Endocrinology and Metabolism* 8(5): 181-186.

- Alt** et al. 1994. the toxic milk mouse does have elevated hepatic metallothionein mrna. *Biochem. J.* 304(1): 317-318.
- QAC** Ette, S. I. and Dickerson, J. W. T. 1979. nutritional studies of the south east peasant diet: studies on the effect of malarial infection (plasmodium berghei) on serum protein and trace element concentrations in rats offered a peasants' diet. *Nigerian Medical Journal* 9(3): 361-365.
- Mix** Ettlemire, C. T. and Matrone, G. 1967. in vivo effect of zinc on iron turnover in rats and life span of the erythrocyte. *Journal of Nutrition* 92(2): 159-64.
- Org Met** Etzel, K. R., Cortez, J. E., and Johnson, D. A. 1988. the addition of picolinic acid to low protein diets - a word of caution. *Nutrition Research* 8(12): 1391-1401.
- Alt** Etzel, K. R. and Cousins, R. J. hormonal regulation of liver metallothionein zinc: independent and synergistic action of glucagon and glucocorticoids (rats). *Proceedings Of The Society For Experimental Biology And Medicine.* June 1981. v. 167 (2) p. 233-236. ill.
- Abstract** Etzel, K. R. and Johnson, D. A. decreased tissue zinc concentration in desalivated rats. 66TH GENERAL SESSION OF THE INTERNATIONAL ASSOCIATION FOR DENTAL RESEARCH, 17TH ANNUAL SESSION OF THE AMERICAN ASSOCIATION FOR DENTAL RESEARCH, AND 12TH ANNUAL MEETING OF THE CANADIAN ASSOCIATION FOR DENTAL RESEARCH, MONTREAL, QUEBEC, CANADA, MARCH 9-13, 1988. *J DENT RES.* 67 (Spec. Issue Mar.). 1988. 237.
- Bact** Etzel, K. R. JONUA, Swerdel, M. R., Swerdel, J. N., and Cousins, R. J. endotoxin-induced changes in copper and zinc metabolism in the syrian hamster (bacteroides melaninogenicus, escherichia coli). *The Journal Of Nutrition.* Dec 1982. v. 112 (12) p. 2363-2373. ill.
- Unrel** Evan, A. P., Mong, S. A., Gattone, V. H., Connors, B. A., Aronoff, G. R., and Luft, F. C. 1984. the effect of streptozotocin and streptozotocin-induced diabetes on the kidney. *Renal Physiology* 7(2): 78-89.
- Org Met** Evans, A. J. 1972. the effect of protamine zinc insulin on weight gain and fat deposition in the juvenile domestic duck. *Quarterly Journal of Experimental Physiology and Cognate Medical*
- Org Met** Evans, G. W. 1990. *Dietary Supplementation With Essential Metal Picolines*. <NOTE> Patent Application. PAT-APPL-7-484 549
- Nut def** Evans, G. W. 1986. zinc and its deficiency diseases. *Clinical Physiology And Biochemistry* 4(1): 94-98.
- Nut def** Evans, G. W., Grace, C. I., and Hahn, C. 1974. the effect of copper and cadmium on 65zn absorption in zinc-deficient and zinc-supplemented rats. *Bioinorganic Chemistry* 3(2): 115-20.
- CP** Evans, G. W., Grace, C. I., and Hahn, C. 1973. homeostatic regulation of zinc absorption in the rat. *Proceedings of the Society for Experimental Biology and Medicine*; 143
- Nut def** Evans, G. W., Grace, C. I., and Votava, H. J. proposed mechanism for zinc absorption in the rat. *Am. J. Physiol.* (1975) 228(2): 501-5.
- CP** Evans, G. W. and Johnson, E. C. 1980. growth stimulating effect of picolinic acid added to rat diets. *Proceedings of the Society for Experimental Biology and Medicine*; 165
- Nut def** Evans, G. W. and Johnson, E. C. zinc absorption in rats fed a low-protein diet and a low-protein diet supplemented with tryptophan or picolinic acid (protein deficiency). *The Journal Of*

Nutrition. May 1980. v. 110 (5) p. 1076-1080. ill.

- Mix** Evans, G. W. and Johnson, E. C. 1980. zinc concentration of liver and kidneys from rat pups nursing dams fed supplemented zinc dipicolinate or zinc acetate. *Journal of Nutrition* 110(10): 2121-4.
- HHE** Evans, G. W. and Johnson, P. E. characterization and quantitation of a zinc binding ligand in human milk. *Pediatric Research.* 14 (7). 1980. 876-880.
- Mix** Evans, Gary W. and Johnson, Elaine C. effect of iron, vitamin b6 and picolinic acid on zinc absorption in the rat. *J. Nutr.* (1981) 111(1): 68-75 .
- Nut def** Evans, Gary W. and Johnson, Elaine C. growth stimulating effect of picolinic acid added to rat diets. *Proc. Soc. Exp. Biol. Med.* (1980) 165(3): 457-61.
- Nut def** Evans, Gary W. and Johnson, Elaine C. zinc absorption in rats fed a low-protein diet and a low-protein diet supplemented with tryptophan or picolinic acid. *J. Nutr.* (1980) 110(5): 1076-80.
- No Dose** Evans, Gary W. and Johnson, Elaine C. zinc concentration of liver and kidneys from rat pups nursing dams fed supplemental zinc dipicolinate or zinc acetate. *J. Nutr.* (1980) 110(10): 2121-4.
- No Tox** Evans, Gary W. and Reis, Brenda L. zinc turnover in mice during pregnancy, lactation, and growth. *Am. J. Clin. Nutr.* (1976) 29(8): 814-16 .
- CP** Evans, Gary W. Editor s Wagner Patricia A. and Kirk, James R. Publisher Univ. Fla. Inst. Food Agric. Sci. Gainesville Fla. interaction among zinc, vitamin b6 and iron. *Proc. Fla. Symp. Micronutr. Hum. Nutr.* (1981). 55-63. 55-63.
- No Dose** Evans, N. A. effect of copper and zinc upon the survival and infectivity of echinoparyphium-recurvatum cercariae. *Parasitology.* 85 (2). 1982. 295-304.
- Nut def** Everett, G. and Apgar, J. effect of zinc deficiency on prostaglandin levels in pregnant rats. *Nutrition Research.* 1985. (suppl. 1) p. 335-337.
- CP** Everett, G. and Apgar, J. 1983. effect of zinc deficiency on prostaglandins f2.alpha. and e in the rat. *Trace Elem. Anal. Chem. Med. Biol. Proc. Int. Workshop, 2nd* : Meeting Date 1982, 219-26. Editor(s): Braetter, Peter; Schramel, Peter. Publisher: de Gruyter, Berlin, Fed. Rep. Ger..
- Nut def** Everett, George A. and Apajar, Jean. urinary taurine, sulfate and urea as possible indicators of zinc status in the rat. *Nutr. Rep. Int.* (1977) 16(4): 391-6.
- Nut def** Everett, George A. and Apgar, Jean. effect of zinc status on salivary zinc concentrations in the rat. *J. Nutr.* (1979) 109(3): 406-11 .
- Meth** Evering, W. E., Haywood, S., Elmes, M. E., Jasani, B., and Trafford, J. 1990. histochemical and immunocytochemical evaluation of copper and metallothionein in the liver and kidney of copper-loaded rats. *Journal of Pathology* 160(4): 305-12.
- Phys** Evering, W. E. N. D., Haywood, S., Bremner, I., and Trafford, J. the protective role of metallothionein in copper overload: i. differential distribution of immunoreactive metallothionein in copper-loaded rat liver and kidney. *Chem.-Biol. Interact.* (1991) 78(3): 283-95.
- Unrel** Eversole, L. R., Rizoiu, I., and Kimmel, A. I. 1997. pulpal response to cavity preparation by an

erbium, chromium:ysgg laser-powered hydrokinetic system. *Journal of the American Dental Association* 128(8): 1099-106.

- CP** Ewing, A. S., McMaster, Dorothy, and Love, A. H. G. 1985. the effect of changing thiamin and zinc levels in the diet of the rat. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th* : Meeting Date 1984, 406-8. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK..
- Nut** Ezzo, O. H. and Hegazy, M. A. 1999. effect of dietary fat on ovarian and metabolic response of heifers suffering from ovarian inactivity. *Veterinary Medical Journal Giza* 47(1): 45-57.
- Anat** FABER, H., BRAUN, K., ZUSCHRATTER, W., and SCHEICH, H. system-specific distribution of zinc in the chick brain: a light and electron-microscopic study using the timm method. *CELL TISSUE RES*; 258 (2). 1989. 247-258.
- Alt** Facchinetti, F., Sasaki, M., Cutting, F. B., Zhai, P., MacDonald, J. E., Reif, D., Beal, M. F., Huang, P. L., Dawson, T. M., Gurney, M. E., and Dawson, V. L. 1999. lack of involvement of neuronal nitric oxide synthase in the pathogenesis of a transgenic mouse model of familial amyotrophic lateral sclerosis. *Neuroscience* 90(4): 1483-92.
- Unrel** Facchinetti Fabrizio, Dawson Valina L, and Dawson Ted M(A). 1998. free radicals as mediators of neuronal injury. *Cellular and Molecular Neurobiology* 18(6): 667-682.
- Drug** Facho, B. 1995. analysis of the dietary vitamin a, copper and zinc status of peulh zebucattle in the dry season. *Recueil De Medecine Veterinaire* 171(12): 847-851.
- Prim** Fadavi, S. and Anderson, A. W. 1996. a comparison of the pulpal response to freeze-dried bone, calcium hydroxide, and zinc oxide-eugenol in primary teeth in two cynomolgus monkeys [see comments]. *Pediatric Dentistry* 18(1): 52-6.
- Unrel** Fagard, R., Gacon, G., Boissel, J. P., Reibel, L., Piau, J. P., Fischer, S., Schapira, G., and Accary, J. P. 1985. detection of tyrosine-specific protein kinases with gastrin as exogenous substrate. *Journal of Biochemical and Biophysical Methods* 10(5-6): 307-14.
- Anat** Fagg, G. E., Scheff, S. W., and Cotman, C. W. 1981. axonal sprouting at the neuro muscular junction of adult and aged rats. *Experimental Neurology*. 74(3): 847-854.
- Phys** Fahim, M. A. 1993. morphological correlates of physiological responses in partially denervated mouse muscle during aging. *International Journal of Developmental Neuroscience* 11(3): 303-10.
- Abstract** Fahim, M. S., Der, R., Fahim, Z., and Harman, J. effect of zinc on reproduction and metabolism. *Journal of Clinical Pharmacology*. 15 (7). 1975 559
- No Oral** Fahim, M. S., Fahim, Z., and Harman, J. M. 1982. chemical sterilization in the male part i: rats. *Archives of Andrology* 9(3): 261-5.
- Unrel** Fahim, M. S., Wang, M., Sutcu, M. F., and Fahim, Z. 1993. zinc arginine, a 5 alpha-reductase inhibitor, reduces rat ventral prostate weight and dna without affecting testicular function. *Andrologia* 25(6): 369-75.
- Nut def** Failla, M. L. and Seidel, K. E. 1988. total body content of copper and other essential metals in rats fed fructose or starch. *Nutrition Research*. 8(12): 1379-1389.
- Alt** Failla, M. L. AJPFA and Kiser, R. A. 1983. hepatic and renal metabolism of copper and zinc in

the diabetic rat. *American Journal Of Physiology.* 244 (2): E115-E121.

- Drug** Failla, Mark L. and Seidel, Karen E. the absorption and retention of dietary zinc by type i diabetic rats are increased by chronic treatment with acarbose. *Drugs Dev. (1993)* 1(.alpha.-Glucosidase Inhibition: Potential Use in Diabetes): 155-62.
- Mix** Fairweather-Tait, S. J. and Southon, S. 1989. studies of iron:zinc interactions in adult rats and the effect of iron fortification of two commercial infant weaning products on iron and zinc status of weanling rats. *The Journal Of Nutrition.* 119(4): 599-606.
- Mix** Fairweather-Tait, S. J. and Southon, S. studies of iron zinc interactions in adult rats and the effect of iron fortification of two commercial infant weaning products on iron and zinc status of weaning rats. *Journal of Nutrition.* 119 (4). 1989. 599-606.
- No COC** Fairweather-Tait, S. J. and Symss, L. L. the effect of maillard reaction products on zinc bioavailability. *Spec. Publ. - R. Soc. Chem. (1989)* 72(Nutr. Availability: Chem. Biol. Aspects): 229-31.
- Nut def** Fairweather-Tait, S. J., Wright, A. J., Cooke, J., and Franklin, J. 1985 . studies of zinc metabolism in pregnant and lactating rats. *British Journal of Nutrition* 54(2): 401-13.
- No COC** Fairweather-Tait, S. J. and Wright, A. J. A. 1985. the effect of 'fibre-filler' (f-plan diet) on iron, zinc and calcium absorption in rats. *The British Journal Of Nutrition.* 54(3): 585-592.
- HHE** Fairweather-Tait, Susan J., Fox, Thomas E., Wharf, S. Gabrielle, Eagles, John, and Kennedy, Hugh. zinc absorption in adult men from a chicken sandwich made with white or wholemeal bread, measured by a double-label stable-isotope technique. *Br. J. Nutr. (1992)* 67(3): 411-19.
- Unrel** Fairweather-Tait Susan J, Jackson Malcolm J, Fox Thomas E, Gabrielle-Wharf, S., Eagles John, and Croghan Peter C. 1993. the measurement of exchangeable pools of zinc using the stable isotope zinc-70. *British Journal of Nutrition* 70(1): 221-234.
- Mix** Fairweather-Tait, Susan J., Payne, Viv, and Williams, Christine M. the effect of iron supplements on pregnancy in rats given a low-zinc diet. *Br. J. Nutr. (1984)* 52(1): 79-86 .
- No COC** Fairweather-Tait, Susan J., Southon, Susan, and Piper, Zoe. the effect of alcoholic beverages on iron and zinc metabolism in the rat . *Br. J. Nutr. (1988)* 60(2): 209-15.
- Nut** Fairweather-Tait, Susan J. and Wright, A. J. A. the effects of sugar-beet fiber and wheat bran on iron and zinc absorption in rats. *Br. J. Nutr. (1990)* 64(2): 547-52 .
- No Oral** Fairweather-Tait, Susan J., Wright, A. J. A., Cooke, Jacqui, and Franklin, J. studies of zinc metabolism in pregnant and lactating rats. *Br. J. Nutr. (1985)* 54(2): 401-13 .
- Nut def** Fairweather-Tait, Susan J., Wright, A. J. A., and Williams, Christine M. zinc metabolism in pregnant and lactating rats and the effect of varying iron:zinc in the diet. *Br. J. Nutr. (1984)* 52(2): 205-13 .
- No Oral** Falandysz, J. 1986. metals and organochlorines in adult and immature males of white-tailed eagle *haliaeetus-albicilla*. *ENVIRON CONSERV.* 13(1): p69-70.
- Bio Acc** Falandysz, J., Jakuczun, B., and Mizera, T. 1988. metals and organochlorines in four female white-tailed eagles. *MAR POLLUT BULL.* 19(10): 521-526.
- HHE** Falutz, J., Tsoukas, C., and Gold, P. 1988. zinc as a cofactor in human immunodeficiency virus-

induced immunosuppression .

- No COC** Fan, N., Jing, Z., Wang, Q., and Zhou, W. studies on bromadiolone against the pika and the zokor. *Acta Theriologica Sinica*. 6 (3). 1986 (Recd. 1987). 211-217.
- FL** Fan Qingsheng, Wei Hua, Xie Junjie, Wu Lingwei, and Fu Jinheng. 1995. effect of flamulina velutipes cultured in zinc enriched medium on the learning ability and immunological function of mice. *Acta Nutrimenta Sinica* 17(1): 89-91.
- No COC** Fang, M. A(A), Noguchi, G. M., and Mcdougall, S. 1995. epidermal growth factor induces egr-1 messenger rna and protein in mouse osteoblastic cells. *Calcified Tissue International* 57(6): 450-455.
- Unrel** Fang, M. M., Lei, K. Y., and Kilgore, L. T. effects of zinc deficiency on dental caries in rats. *J. Nutr. (1980)* 110(5): 1032-6.
- Mix** Fang, V. S. and Furuhashi, N. 1978. partial alleviation of the antitesticular effect of pipercolinomethylhydroxyindane by zinc in rats. *J. Endocrinol.* 79(1): 151-2 .
- Unrel** Farag, M. S. T. 1990. the effect of the antibiotic zinc bacitrocin on the metabolism of rabbits. 111 P.
- Nut def** Faraji, B., Kang, H. K., and Swendseid, M. E. 1979. growth rate, tissue and zinc levels and activities of selected enzymes in rats fed zinc deficient diets by gastric tube. *Federation Proceedings* 38(3, I): 606.
- Nut def** Faraji, B. and Swendseid, M. E. 1983. growth rate, tissue zinc levels and activities of selected enzymes in rats fed a zinc-deficient diet by gastric tube. *Journal of Nutrition* 113(2): 447-55.
- Nut def** Faraji, B. JONUA and Swendseid, M. E. 1983. growth weight, tissue zinc levels and activities of selected enzymes in rats fed a zinc-deficient diet by gastric tube. *The Journal Of Nutrition*. 113 (2): 447-455.
- Nut def** Faraji, Bahram and Swendseid, Marian E. growth rate, tissue zinc levels and activities of selected enzymes in rats fed a zinc-deficient diet by gastric tube. *J. Nutr. (1983)* 113(2): 447-55.
- Phys** Farber, S. D., Farber, M. O., Brewer, G., Magnes, C. J., and Peterson, R. G. 1991. oxygen affinity of hemoglobin and peripheral nerve degeneration in experimental diabetes. *Journal of the Neurological Sciences* 101(2): 204-7.
- HHE** Fashandi, E. F., Reid, R. L., Stout, W. L., Hern, J. L., and Bennett, O. L. the effect of fluidized bed combustion residue on the composition and nutritional quality of food crops for hamsters and rats. *Qualitas Plantarum Plant Foods for Human Nutrition*. 35 (4). 1985. 359-374.
- Mineral** Fasshauer, U. 1993. effect of antimicrobial feed additives on apparent prececa digestibility of nitrogen and minerals in the pig. 89 pp.
- FL** Fasshauer, U. and Kienzle, E. Muenchen Univ. Germany Inst. fuer Physiologie Physiologische Chemie und Tierernaehrung. Lehrstuhl fuer Tierernaehrung und Diaetetik. 1995. effect of citric acid, olaquinox, zinc-bacitracin and zinc oxide on prececal digestion of crude nutrients and ileocaecal flow of minerals in minipigs. *Journal of Animal Physiology and Animal Nutrition*. V. 74(4-5) P. 219-226
- Bact** Fatimah, C. T. N. I. 1994. the effects of administering lactobacillus acidophilus or streptococcus

faecium to calves in an attempt to prevent or minimise neonatal calf diarrhoea. *Jurnal Veterinar Malaysia* 6(1): 9-16.

- CP** Fatkulina, T. A. and Rish, M. A. 1986. effect of goitrogenic load on the thyroid gland during environmental iodine insufficiency. *Spurenelem.-Symp. 5th* : Issue JOD, 129. Editor(s): Anke, Manfred. Publisher: Friedrich-Schiller-Univ. Jena, Jena, Ger. Dem. Rep..
- FL** Fatkulina, L. D., Glushchenko, N. N., Kossova, G. V., Yaglov, L. G., and Fedorov Yu I. stimulation of dna and protein synthesis by finely dispersed zinc powder. *IZV Izvestiya Akademii Nauk Sssr Seriya Biologicheskaya. 0 (1). 1984. 130-133.*
- Nut** Fattet, I., Hovell, F. D. D., Orskov, E. R., Kyle, D. J., Pennie, K., and Smart, R. I. 1984. undernutrition in sheep. the effect of supplementation with protein on protein accretion. *The British Journal Of Nutrition.* 52(3): 545-560.
- No COC** Fau, D., Chanez, M., Bois-Joyeux, B., and Peret, J. 1979. metabolic implications of methionine excess. effects of methionineexcess, dietary protein, fasting, cortisol and insulin on certainhepatic enzyme activities involved in transsulfuration, glycolysis, gluconeogenesis and lipogenesis in adapted adult rats. *Annales De Biologie Animale, Biochimie, Biophysique* 19(2A): 343-353.
- Drug** Faure, P., Bouvard, S., Rossini, E., Favier, A., and Halimi, S. high vitamin e amount leads to a modification of zinc and copper tissue distribution in high fructose-fed rats exhibiting an insulin resistance. *Trace Elem. Electrolytes (1999)* 16(1): 26-32.
- Phys** Faure, P., Lafond, J. L., Coudray, C., Rossini, E., Halimi, S., Favier, A., and Blache, D. 1994. zinc prevents the structural and functional properties of free radical treated-insulin. *Biochimica Et Biophysica Acta = International Journal Of Biochemistry And Biophysics.* 1209(2): 260-264.
- Drug** Faure, P., Rossini, E., Lafond, J. L., Richard, M. J., Favier, A., and Halimi, S. 1997. vitamin e improves the free radical defense system potential and insulin sensitivity of rats fed high fructose diets. *Journal of Nutrition* 127(1): 103-107.
- Nut def** Faure, P., Roussel, A. M., Martinie, M., Osman, M., Favier, A., and Halimi, S. insulin sensitivity in zinc-depleted rats : assessment with the euglycemic hyperinsulinic clamp technique. *Diabete Metab. (1991)* 17(3): 325-31.
- Nut def** Faure, P., Roussel, A. M., Richard, M. J., Foulon, T., Gros Lambert, P., Hadjian, A., and Favier, A. effect of an acute zinc depletion on rat lipoprotein distribution and peroxidation. *Biol. Trace Elem. Res. (1991)* 28(2): 135-46.
- In Vit** Faus, Juan, Garcia-Espana, Enrique, Marcelino, Victor, Bencini, Andrea, and Bianchi, Antonio. interaction of zinc(ii) and cadmium(ii) with large polyazacycloalkanes in dms0/water (80:20 vol./vol.). a potentiometric study. *Inorg. Chim. Acta (1990)* 172(2): 203-9 .
- Anat** Fausson-Pellegrini, M. S(A), Matini, P., and Stach, W. 1996. differentiation of enteric plexuses and interstitial cells of cajal in the rat gut during pre- and postnatal life. *Acta Anatomica* 155(2): 113-125.
- Rev** Faust, I. M. and Miller, W. H. Jr. 1981. effects of diet and environment on adipocyte development. *International Journal of Obesity* 5(6): 593-6.
- Nut def** Favier, A., Ruffieux, D., Decoux, G., and Arnaud, J. 1983. results of a study to detect the effects on neonates of copper and zinc-deficiency during pregnancy. *Journal Of Inherited Metabolic Disease* 1983, V6, S2, P93-94

- Unrel** Favier, A. E. 1992. the role of zinc in reproduction. hormonal mechanisms. *Biological Trace Element Research* 32: 363-82.
- Nut def** Favier, M., Faure, P., Roussel, A. M., Coudray, C., Blache, D., and Favier, A. zinc deficiency and dietary folate metabolism in pregnant rats. *J. Trace Elem. Electrolytes Health Dis.* (1993) 7(1): 19-24.
- Unrel** Fawzi, M. I., Shklar, G., and Krakow, A. A. 1985. the effect of radiation on the response of dental pulp to operative and endodontic procedures: an experimental study. *Oral Surgery, Oral Medicine, and Oral Pathology* 59(4): 405-13.
- Surv** Fayez, I., Marai, M., El-Darawany, A. A., and Nasr, A. S. 1992. typical repeat breeding and its improvement in buffaloes. *Beitrag Zur Tropischen Landwirtschaft Und Veterinarmedizin* 30(3): 305-314.
- FL** Fazzari, C. and Catini, C. 1968. [effects of zncl 2 on motor neurons in the spinal marrow]. <original> effetti del zncl 2 sui motoneuroni del midollo spinale. *Archivio Italiano Di Anatomia e Di Embriologia* 73(2): 189-99.
- FL** FAZZARI, C. and CATINI, C. histological changes of kidney epithelium after treatment with zinc chloride. *SPERIMENTALE* 117:299-314,1967
- Mix** Feaster, J. P., Van Middeltem, C. H., and Davis, G. K. 1972. zinc-ddt interrelationships in growth and reproduction in the rat. *J Nutr.* 102(4): 523-7.
- Bact** Fee, J. A., Mcclune, G. J., O'neill, P., and Fielden, E. M. saturation behavior of super oxide dis mutation catalyzed by the iron containing super oxide dis mutase of escherichia-coli b. *Biochemical and Biophysical Research Communications.* 100 (1). 1981. 377-384.
- HHE** Fehily, D., Fitzsimmons, B., Jenkins, D., Cremin, F. M., Flynn, A., and Soltan, M. H. 1986. association of fetal growth with elevated maternal plasma zinc concentration in human-pregnancy. *Human Nutrition-Clinical Nutrition* 040c(3): 221-227.
- FL** Fehrmann, P., Krause, R., Hahn von Dorsche, H., and Sulzmann, R. 1974. [histotopochemical investigations on the islets of langerhans of the pancreas from fetal and newborn wistar-rats. a contribution to the development of the rat isle (author's transl)]. <original> histotopochemische untersuchungen an langedansschen inseln des pankreas von fetalen und neugeborenen wistar-ratten. ein beitrage zur entwicklung der ratteninsel. *Acta Histochemica* 49(1): 1-16.
- No COC** Fehrmann, P., Krause, R., Von Dorsche H H, and Sulzmann, R. histo topochemical investigations on the islets of langerhans of the pancreas from fetal and new born wistar rats a contribution to the development of the rat islet. *Acta Histochemica.* 49 (1). 1974 1-16.
- CP** Feiler, L. S., Smolin, G., Okumoto, M., and Condon, D. herpetic keratitis in diet deficient animals 1. zinc deficiency. *ANNUAL SPRING MEETING OF THE ASSOCIATION FOR RESEARCH IN VISION AND OPHTHALMOLOGY INCORPORATED, ORLANDO, FLA., USA, MAY 4-9, 1980. INVEST OPHTHALMOL VISUAL SCI.* 0 (Suppl.). 1980. 158.
- Nut def** Feiler, L. S., Smolin, G., Okumoto, M., and Condon, D. 1982. herpetic keratitis in zinc-deficient rabbits. *Investigative Ophthalmology & Visual Science* 22(6): 788-95 .
- Nut def** Feiler, L. Scott, Smolin, Gilbert, Okumoto, Masao, and Gondon, Deborah. herpetic keratitis in zinc-deficient rabbits. *Invest. Ophthalmol. Visual Sci.* (1982) 22(6): 788-95.
- Nut** Fekete Sandor and Hullar Istvan. 1996. modern aspects for feeding breeding pigs. *Magyar*

Allatorvosok Lapja 51(11): 672-680.

- Nut def** Fell, B. F., Leigh, L. C., and Williams, R. B. cytology of various organs in zinc-deficient rats with particular reference to the frequency of cell division. *Res. Vet. Sci.* (1973) 14(3): 317-25.
- Alt** Feller, D. D. and Neville, E. D. insulin-like effect of bovine growth hormone in-vivo as demonstrated by oxidation of carbon-14 uniformly labeled glucose in diabetic rats. *Physiological Chemistry and Physics*. 10 (4). 1978 (Recd. 1979). 291-304.
- Drug** Feller, D. J., Tso-Olivas, D. Y., and Savage, D. D. hippocampal mossy fiber zinc deficit in mice genetically selected for ethanol withdrawal seizure susceptibility. *Brain Research*. 545 (1-2). 1991. 73-79.
- No COC** Feller, D. J(A), Bassir, J. M., Crabbe, J. C., and Le Fevre C A. 1994. audiogenic seizure susceptibility in wsp and wsr mice. *Epilepsia* 35(4): 861-867.
- Org Met** FELLOWS, D. P., PANK, L. F., and ENGEMAN, R. M. hazards to birds from zinc phosphide rat bait in a macadamia orchard. *WILDL SOC BULL*; 16 (4). 1988. 411-416.
- Bio Acc** Fendick, E. A., Stevens, G. L., Brown, R. J., and Jordan, W. P. 1989. element content in tissues of four rodent species sampled in the geysers geothermal steamfield california usa. *ENVIRON POLLUT*. 58(2-3): 155-178.
- CP** Fenton, M. R., Behfar, K., Pallucci, M., and Burke, J. P. effect of a zinc deficient diet on physical and chemical parameters of bone. 1992 MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY (FASEB), PART I, ANAHEIM, CALIFORNIA, USA, APRIL 5-9, 1992. FASEB (FED AM SOC EXP BIOL) J. 6 (4). 1992. A1093.
- Nut def** Fenton, M. R. and Burke, J. P. 1983. the effect of a zinc-deficient diet on the subcellular-distribution of zinc in mouse-liver. *Federation Proceedings* 42: 2270.
- Carcin** Fenton, Marilyn R. and Burke, James P. changes in serum, liver, and tumor zinc levels during plasmacytoma growth in balb/c mice. *Proc. Soc. Exp. Biol. Med.* (1983) 173(3): 390-7 .
- Nut def** Fenton, Marilyn R. and Burke, James P. subcellular zinc distribution in livers and tumors of plasmacytoma-bearing mice. *Nutr. Res. (N. Y.)* (1985) 5(12): 1383-91.
- No Oral** Fenton, Marilyn R., Burke, James P., Miller, Mark L., and Tursi, Florence D. the effect of a zinc-deficient diet on the enzymic activity of rat neutrophils. *Nutr. Rep. Int.* (1980) 22(3): 323-8.
- Nut def** Fenton, Marilyn R., Burke, James P., Techner, Lee M., and Chinkes, Shelly L. lipid levels in tumor-bearing mice maintained on a zinc deficient diet. *Nutr. Rep. Int.* (1984) 29(4): 921-7.
- Nut def** Fenton, Marilyn R., Burke, James P., Tursi, Florence D., and Arena, Frank P. 1980. effect of a zinc-deficient diet on the growth of an igm-secreting plasmacytoma (tepc-183). *J. Natl. Cancer Inst.* 65(6): 1271-2
- CP** Fenwick, P., McDonald, D., Aggett, P. J., Huber, C., and Wakelin, D. the effect of zinc deficiency and repletion on the response of rats to infection with strongyloides ratti. *Trace Elements In Man And Animals : Tema 5 : Proceedings Of The Fifth International Symposium On Trace Elements In Man And Animals / Editors C.f. Mills, I. Bremner, & J.k. Chesters.* p. 220-222.
- Nut def** Fenwick, Paul K., Aggett, Peter J., MacDonald, Donald, Huber, Cynthia, and Wakelin, Derek.

zinc deficiency and zinc repletion: effect on the response of rats to infection with trichinella spiralis. *Am. J. Clin. Nutr.* (1990) 52(1): 166-72.

- Nut def** Fenwick, Paul K., Aggett, Peter J., MacDonald, Donald C., Huber, Cynthia, and Wakelin, Derek. zinc deprivation and zinc repletion: effect on the response of rats to infection with strongyloides ratti. *Am. J. Clin. Nutr.* (1990) 52(1): 173-7.
- Nut def** Ferguson, H. W. and Leaver, A. G. 1969. effects of high dietary zinc on the bones and teeth of rats maintained on low calcium regimes. *Journal of Bone and Joint Surgery. British Volume* 51(2): 383-4.
- No Oral** Ferm, V. H. and Hanlon, D. P. placental transfer of zinc in the syrian hamster during early embryogenesis. *J. Reprod. Fert.* (1974) 39(1): 49-52 .
- No Oral** Ferm, Vergil H. and Carpenter, Stanley J. teratogenic effect of cadmium and its inhibition by zinc. *Nature (London)* (1967) 216(5120): 1123 .
- Nut def** Fernandes, G. and Nair, M. impairment of cell-mediated immunity functions by dietary zinc deficiency in mice. *Proceedingsnational Academy Of Sciences.* Jan 1979. v. 76 (1) p. 457-461. ill.
- CP** Fernandes, G., Nair, M., Onoe, K., Tanaka, T., Floyd, R., and Good, R. A. impairment of cell mediated immunity functions by dietary zinc deficiency in mice. *Proceedings of the National Academy of Sciences of the United States of America.* 76 (1). 1979. 457-461.
- CP** Fernandes, P. R(A), Samuelson, D. A., Smith, P. J., Lewis, P., and Cousins, R. J(A). 1995. morphologic and altered metal binding of ocular melanin in the lethal-milk (lm) mouse. *Investigative Ophthalmology & Visual Science* 36(4): S917.
- FL** Fernandez, E., Tortuero, F., and Martin, L. 1994. the effects of different levels of dietary sepiolite on tibialdyschondroplasia in chickens. *Archiv Fur Geflugelkunde* 58(4): 171-175.
- Nut def** Fernandez, M. A. PSEBA and O'Dell, B. L. 1983. effect of zinc deficiency on plasma glutathione in the rat. *Proceedings Of The Society For Experimental Biology And Medicine.* 173 (4): 564-567.
- Nut def** Fernandez-Madrid, F., Prasad, A. S., and Oberleas, D. 1973. effect of zinc deficiency on nucleic acids, collagen, and noncollagenous protein of the connective tissue. *Journal of Laboratory and Clinical Medicine* 82(6): 951-61.
- Nut def** Fernandez, Mark A. and O'Dell, Boyd L. effect of zinc deficiency on plasma glutathione in the rat. *Proc. Soc. Exp. Biol. Med.* (1983) 173(4): 564-7.
- FL** Fernandez N, Cecilia Soledad. 1997. [bone metabolic diseases in purebred race horses, less than 12 months old. incidence, etiology, pathology, diagnostic. latest 10 years advance]. <original> enfermedades metabolicas del hueso (mbd) en el equino fina sangre de carrera, arabe y cuarto de milla menor de 12 meses de edad. incidencia, etiologia, patologia y diagnostico. avances en los ultimos 10 anos. 193 P.
- No Oral** Fernandez-Novoa L(A), Alvarez, X. A., Sempere, J. M., Miguel-Hidalgo, J. J., Diaz, J., Franco-Maside, A., and Cacabelos, R. 1997. effects of anapsos on the activity of the enzyme cu-zn-superoxide dismutase in an animal model of neuronal degeneration. *Methods and Findings in Experimental and Clinical Pharmacology* 19(2): 99-106 .
- In Vit** Fernandez-Pol, J. A. iron possible cause of the g-1 arrest induced in normal rat kidney cells by

- picolinic-acid. *Biochemical and Biophysical Research Communications*. 78 (1). 1977 136-143.
- Org Met** Fernandez, R., Lucas, E., and McGinnis, J. 1973. effect of diet composition on chick growth response to different types and levels of feed medication. *Poultry Science* 52(6): 2237-43.
- Drug** Fernandez, R., Lucas, E., and McGinnis, J. 1973. effect of diet on growth and feed efficiency responses to supplements of md bacitracin and 3-nitro phenylarsonic acid added singly and in combinations. *Poultry Science* 52(6): 2306-11.
- Org Met** Fernandez, R., Lucas, E., and McGinnis, J. 1973. influence of diet composition on chick growth response to different antibiotics, feed additives and combination of the additives. *Poultry Science* 52(6): 2299-305.
- No COC** Ferrando, R., Henry, N., Klur, M., and Megard, J. P. 1972. nitrogen and amino acid content of caecotrophes and other faeces incollared rabbits given antibiotics in diet or not. *Annales De La Nutrition Et De L'Alimentation* 26(5): 189-196.
- No COC** Ferrando, R., Palisse, M., Jacquot, L., and Furlon, C. 1981. effect of zinc bacitracin and flavomycin on transfer of vitamin a to the egg. *International Journal for Vitamin and Nutrition Research* 51(1): 9-15.
- No COC** Ferrando, R., Palisse, M., Jacquot, L., and Furlon, C. 1981. [transfer of vitamin a to the egg influenced by bacitracin or flavomycin (author's transl)]. <original> transfert de la vitamine a a l'oeuf influence de la bacitracine-zinc et du flavophospholipol. *International Journal for Vitamin and Nutrition Research* 51(1): 9-15.
- CP** Ferrari, D., Chiozzi, P., Munerati, M., and Di Virgilio F. 1993. regulation of apoptosis in pc12 cells. *Molecular Biology of the Cell* 4(SUPPL.): 368A.
- No COC** Ferre, Natalia, Girona, Josefa, Cabre, Maria, Joven, Jorge, LaVille, Agnes, Masana, Lluís, Paternain, Jose Luis, and Camps, Jordi. hepatic production of apolar aldehydes in rats with carbon tetrachloride-induced cirrhosis. *Mol. Cell. Biochem.* (1999) 198(1&2): 57-60 .
- Nut def** Ferreira, R. M. C. D. C., Rodriguez Gonzalez J I, Monreal Marquiegui I, and Villa Elizaga I. changes in the fetal tibial growth plate secondary to maternal zinc deficiency in the rat a histological and histochemical study. *Teratology*. 44 (4). 1991. 441-452.
- Nut def** Ferreira, R. M. C. da Cunha, Marquiegui, I. Monreal, and Villa Elizaga, I. teratogenicity of zinc deficiency in the rat : study of the fetal skeleton. *Teratology* (1989) 39(2): 181-94.
- Nut def** Ferreira Rmcd, Marquiegui, I. M., and Elizaga, I. V. 1989. teratogenicity of zinc-deficiency in the rat - study of the fetal skeleton. *Teratology* 39(2): 181-194.
- No COC** Ferreira Sergio T(A), Stella Lorenzo, and Gratton Enrico. 1994. conformational dynamics of bovine cu, zn superoxide dismutase revealed by time-resolved fluorescence spectroscopy of the single tyrosine residue. *Biophysical Journal* 66(4): 1185-1196.
- Carcin** Ferrier, A. F., Lee, M., Anderson, W. B., Benvenuto, G., Morrison, D. K., Lowy, D. R., and DeClue, J. E. 1997. sequential modification of serines 621 and 624 in the raf-1 carboxyl terminus produces alterations in its electrophoretic mobility. *Journal of Biological Chemistry* 272(4): 2136-42.
- Unrel** Fesolowich, A. T. 1973. *Evaluation of Dog Bone Fiber Composites for Use in Weapon Components*. <NOTE> Final Rept. AMSWE-R-RR-T-6-48-73

- FL** Fessler, A., Fetterroll, D., and Reiss, H. 1971. [mechanical and histological studies on durelon]. <original> mechanische und histologische untersuchungen uber durelon. *Deutsche Zahnarztliche Zeitschrift* 26(2): 241-6.
- HHE** Festa, M. D., Anderson, H. L., Dowdy, R. P., and Ellersieck, M. R. 1985. effect of zinc intake on copper excretion and retention in men. *American Journal Of Clinical Nutrition* 41(2): 285-292.
- CP** Fiber, J. M(A), Rahaman, F., and Swann, J. M. 1994. decrease in pheromone stimulated fos labeling in the bed nucleus of the stria terminalis (bnst) and medial nucleus of the amygdala (me) after zinc sulfate (znso-4) treatment in male hamsters. *Society for Neuroscience Abstracts* 20(1-2): 330.
- Abstract** Fichman, D. and King, J. C. the effects of chronic ethanol intake and diet on nutritional status of the weanling mouse. *65TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ATLANTA, GA., USA, APRIL 12-17, 1981. FED PROC.* 40 (3 Part 1). 1981. 803.
- No Dose** Field, R. A., Bennett, G. L., and Munday, R. 1985. effect of excess zinc and iron on lamb carcass characteristics. *New Zealand Journal Of Agricultural Research* 28(3): 349-355.
- Diss** Fields, Jacqueline Elaine. 1984. effect of selected dietary fibers on zinc availability in the rat. Avail.: Univ. Microfilms Int. Order No. DA8426960 From: Diss. Abstr. Int. B 1985, 45. 9. 2874-5. 126 pp.
- Mix** Fields, Meira, Reiser, Sheldon, and Smith, J. Cecil Jr. effect of copper and zinc on insulin binding and glucose transport by isolated rat adipocytes. *Nutr. Rep. Int.* (1983) 28(1): 163-9.
- No COC** Fiems, L. O., Vanopdenbosch, E., Boucque, C. V., Vancoillie, Y., and Cottyn, B. G. 1989. effect of purified immunoglobulins or pooled colostrum on performance of rearing calves. *Animal Feed Science and Technology* 26(3-4): 347-356.
- Nut** Filer, L. J. Jr., Andersen, D. W., Cotton, R. H., and <Editors> Tumbleson, M. E. 1986. effect of dietary fiber on growing pigs. <document title>swine in biomedical research. volume 2. 701-708.
- HHE** Filipe, P. M., Fernandes, A. C., and Manso, C. F. effects of zinc on copper-induced and spontaneous lipid peroxidation. *Biol. Trace Elem. Res.* (1995) 47(1-3): 51-6.
- FL** Filipovic, Z. and Stevancevic, M. 1999. application of zno in diet for induction of moulting in ssl-hybrid henson a farm "koka-promet" in budva, yugoslavia. *Zivinarstvo* 34(10): 9-12.
- CP** Filo, Ronald S., Sloan, Charles H., Weatherbee, Lee, and Fry, William J. 1970. influence of zinc and copper on the development of experimental atherosclerosis. *Atheroscler. Proc. Int. Symp., 2nd* : Meeting Date 1969, 476-81. Editor(s): Jones, Richard J. Publisher: Springer, New York, N. Y.
- Nut def** Filteau, S. M. and Woodward, B. 1982. the effect of severe protein deficiency on serum zinc concentration of mice fed a requirement level or a very high level of dietary zinc. *The Journal Of Nutrition*. 112 (10): 1974-1977.
- Nut def** Filteau, S. M. and Woodward, B. 1984. relationship between serum zinc level and immunocompetence in protein-deficient and well-nourished weanling mice. *Nutrition Research* 4(5): 853-866.

- Nut def** Filteau, S. M. and Woodward, Bill. the effect of severe protein deficiency on serum zinc concentration of mice fed a requirement level or a very high level of dietary zinc. *J. Nutr.* (1982) 112(10): 1974-7.
- Nut def** Filteau, S. M. and Woodward, Bill. relationship between serum zinc level and immunocompetence in protein-deficient and well-nourished weanling mice. *Nutr. Res. (N. Y.)* (1984) 4(5): 853-66.
- Unrel** Fimia, G. M., De Cesare, D., and Sassone-Corsi, P. 1999. cbp-independent activation of clem and creb by the lim-only protein act. *Nature* 398(6723): 165-9.
- Org Met** Fin Cynthia, Schmitz Paulo K, Da Silva Ricardo C, Bernabeu Ramon, Medina Jorge H, and Izquierdo Ivan(A). 1994. intrahippocampal, but not intra-amygdala, infusion of an inhibitor of heme oxygenase causes retrograde amnesia in the rat. *European Journal of Pharmacology* 271(1): 227-229.
- Prim** Fincham, J. E., Faber, M., Weight, M. J., Labadarios, D., Taljaard, J. J., Steytler, J. G., Jacobs, P., and Kritchevsky, D. 1987. diets realistic for westernized people significantly effect lipoproteins, calcium, zinc, vitamins c, e, b6 and haematology in vervet monkeys. *Atherosclerosis* 66(3): 191-203.
- Drug** Finelli, V. N., Klauder, D. S., Karaffa, M. A., and Petering, H. G. 1975. interaction of zinc and lead on delta-aminolevulinate dehydratase. *Biochemical and Biophysical Research Communications* 65(1): 303-12.
- In Vit** Finelli, V. N., Murthy, L., Peirano, W. B., and Petering, H. G. 1974. delta amino levulinate dehydratase ec-4.2.1.24 a zinc dependent enzyme. *Biochemical and Biophysical Research Communications*. 60(4): 1418-1424.
- Phys** Fini, C., Bertoli, E., Albertini, G., Floridi, A., and Tanfini, F. structural and functional relationships in 5' nucleotidase from bull seminal plasma a fourier transform infrared study. *Biochimica Et Biophysica Acta*. 1118 (2). 1992. 187-193.
- Unrel** FINI, C., PALMERINI, C. A., DAMIANI, P., STOCHAJ, U., MANNHERZ, H. G., and FLORIDI, A. 1990. 5'-nucleotidase from bull seminal plasma, chicken gizzard and snake venom is a zinc metalloprotein. *BIOCHIM BIOPHYS ACTA*; 1038 (1). 18-22.
- CP** Finley, J. W. and Johnson, P. E. dietary zinc affects the amount and molecular distribution of zinc in endogenous secretions. *75TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ATLANTA, GEORGIA, USA, APRIL 21-25, 1991. FASEB (FED AM SOC EXP BIOL) J.* 5 (5). 1991. A920.
- No Oral** Finley, John and Johnson, Phyllis E. relative influence of amount of dietary zinc and infusion of protein into the duodenum on the amount of zinc in biliary/pancreatic secretions. *Nutr. Res. (N. Y.)* (1992) 12(10): 1217-28.
- Nut def** Finot, P. A. and Furniss, D. E. nephrocytomegaly in rats induced by maillard reaction products: the involvement of metal ions. *Dev. Food Sci.* (1986) 13(Amino-Carbonyl React. Food Biol. Syst.): 493-502.
- Rev** Finot, Paul Andre and Furniss, Diane E. metabolic transit and toxicity of maillard reaction products. *Prog. Clin. Biol. Res.* (1989) Volume Date 1988, 304(Maillard React. Aging, Diabetes, Nutr.): 343-58.
- Bact** Firth, E. C., Wensing, T., and Seuren, F. 1987. an induced synovitis disease model in ponies.

Cornell Veterinarian 77(2): 107-118.

- In Vit** Fischer, P. W., Giroux, A., and L'Abbe, M. R. 1983. effects of zinc on mucosal copper binding and on the kinetics of copper absorption. *Journal of Nutrition* 113(2): 462-9.
- Mix** Fischer, P. W. F., Abbe, M. R. L., Giroux, A., and Jones, J. D. 1986. effect of zinc supplementation on copper status of rats fed rapeseed protein concentrate. *Canadian Institute of Food Science and Technology Journal* 19(2): 82-85.
- Prim** Fischer, P. W. F. and Giroux, A. 1987. effect of zinc supplementation on the copper status and cholesterol levels of cynomolgus monkeys. *Nutrition Research* 7(5): 499-508.
- Nut def** Fischer, P. W. F., Giroux, A., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. effect of phytate and zinc depletion on the status of copper and iron. 668-669.
- CP** Fischer, P. W. F. and Labbe, M. R. 1983. the effect of dietary zinc on the activity of copper metalloenzymes in the rat. *Federation Proceedings* 42: 2270.
- In Vit** Fischer, Peter W. F. and Bettger, William J. the relationship between the rate of chelator-induced zinc efflux from erythrocytes and zinc status. *Biol. Trace Elem. Res.* (1992) 34(3): 287-97.
- In Vit** Fischer, Peter W. F., Giroux, Alex, and L'Abbe, Mary R. effects of zinc on mucosal copper binding and on the kinetics of copper absorption. *J. Nutr.* (1983) 113(2): 462-9.
- Prim** Fischer, Peter W. F. and Giroux, Alexandre. effect of zinc supplementation on the copper status and cholesterol levels of cynomolgus monkeys. *Nutr. Res. (N. Y.)* (1987) 7(5): 499-508.
- Mix** Fischer, Peter W. F., Giroux, Alexandre, Belonje, Bartholomeus, and Shah, Bhagwan G. the effect of dietary copper and zinc on cholesterol metabolism. *Am. J. Clin. Nutr.* (1980) 33(5): 1019-25.
- In Vit** Fischer, Peter W. F., Giroux, Alexandre, and L'Abbe, Mary R. the effect of dietary zinc on intestinal copper absorption. *Am. J. Clin. Nutr.* (1981) 34(9): 1670-5.
- Nut def** Fischer, Peter W. F. and L'Abbe, Mary R. copper transport by intestinal brush border membrane vesicles from rats fed high zinc or copper deficient diets. *Nutr. Res. (N. Y.)* (1985) 5(7): 759-67.
- Mix** Fischer, Peter W. F., L'Abbe, Mary R., Giroux, Alexandre, and Jones, John D. effect of zinc supplementation on copper status of rats fed rapeseed protein concentrate. *Can. Inst. Food Sci. Technol. J.* (1986) 19(2): 82-5.
- No Control** Fisher, C., Laursen-Jones, A. P., Hill, K. J., and Hardy, W. S. 1973. the effect of copper sulphate on performance and the structure of the gizzard in broilers. *BR POULT SCI.* 14(1): 55-68.
- Mix** FISHER, D. R., MAYS, C. W., and TAYLOR, G. N. 1975. ca-dtpa toxicity in the mouse fetus. *Health Physics.* 29(5): 780-782.
- Mix** Fisher, D. R., Mays, C. W., and Taylor, G. N. 1975. calcium di ethylenetriamine penta acetic acid toxicity in the mouse fetus. *Health Physics.* 29(5): 780-782.
- Phys** Fisher, E. W. and Martinez, A. A. 1978. the relationship between the zinc sulfate turbidity test serum immune globulins and the susceptibility of calves to diarrhea. *British Veterinary Journal.* 134(3): 231-233.

- HHE** Fisher, G. L. and Shifrine, M. serum-copper and serum-zinc levels in dogs and humans with neoplasia. *ERDA Symp. Ser. (1977)* 42(Biol. Implic. Met. Environ., Proc. Annu. Hanford Life Sci. Symp., 15th): 507-22.
- In Vit** Fisher, J. M. and Rabionvitz, M. protection against cyto toxicity of endogenous copper in the requirement for mercapto ethanol by a lymphoma in primary culture. *Biochemical and Biophysical Research Communications*. 108 (2). 1982. 851-853.
- Prim** Fisher, S. E., Alcock, N. W., Amirian, J., and Altshuler, H. L. 1988. neonatal and maternal hair zinc levels in a nonhuman primate model of the fetal alcohol syndrome. *Alcoholism, Clinical and Experimental Research* 12(3): 417-21.
- Prim** Fisher, Stanley E., Alcock, Nancy W., Amirian, James, and Altshuler, Harold L. neonatal and maternal hair zinc levels in a nonhuman primate model of the fetal alcohol syndrome. *Alcohol.: Clin. Exp. Res. (1988)* 12(3): 417-21.
- Nut def** Fitzgerald, J. A., Everett, G. A., and Apgar, J. 1986. effect of low zinc intake during pregnancy on plasma prolactin, progesterone, prostaglandin, cortisol and protein concentrations of ewes during the periparturient period. *Canadian Journal of Animal Science* 66(3): 643-651.
- Unrel** Fitzgerald, S. D. and Richard, A. 1995. comparison of four fixatives for routine splenic histology and immunohistochemical staining for group ii avian adenovirus. *Avian Diseases* 39(2): 425-431.
- No Oral** Flachowsky, G., Grun, M., Kronemann, H., Tiroke, K., and Koch, H. 1989. influence of type of diet and incubation time on major and trace elements release in sacco from italian ryegrass. 466-472.
- FL** Flagstad, T. 1977. intestinal absorption of 65zinc in a46 (adema disease) after treatment with oxychinolines. *Nordisk Veterinaermedicin* 29(2): 96-100.
- FL** Flagstad, T. 1976. lethal trait a46 in cattle. intestinal zinc absorption. *Nordisk Veterinaermedicin* 28(3): 160-169.
- Mix** Flagstad, T. 1981. zinc absorption in cattle with a dietary picolinic acid supplement. *Journal of Nutrition* 111(11): 1996-9.
- No COC** Flagstad, Thoege. zinc absorption in cattle with a dietary picolinic acid supplement. *J. Nutr. (1981)* 111(11): 1996-9.
- Abstract** Flanagan, P. R. digestion in rats with pure zinc deficiency. *68TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 1-6, 1984 FED PROC.* 43 (4). 1984. Abstract 3308.
- Nut def** Flanagan, P. R. 1984. a model to produce pure zinc deficiency in rats and its use to demonstrate that dietary phytate increases the excretion of endogenous zinc. *Journal of Nutrition* 114(3): 493-502.
- Nut def** Flanagan, P. R., Haist, J., and Valberg, L. S. 1983. zinc absorption, intraluminal zinc and intestinal metallothionein levels in zinc-deficient and zinc-replete rodents. *Journal of Nutrition* 113(5): 962-72.
- No COC** Flanagan, P. R. and Valberg, L. S. 1983. dietary phytate increases the excretion of endogenous zinc in rats. *Gastroenterology* 84: 1154.

- Nut def** Flanagan, Peter R. a model to produce pure zinc deficiency in rats and its use to demonstrate that dietary phytate increases the excretion of endogenous zinc. *J. Nutr.* (1984) 114(3): 493-502.
- CP** Flanagan, Peter R. 1985. short term induction of acute pure zinc deficiency in rats. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th* : Meeting Date 1984, 208-10. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK.
- Nut def** Flanagan, Peter R., Haist, James, and Valberg, Leslie S. zinc absorption, intraluminal zinc and intestinal metallothionein levels in zinc-deficient and zinc-replete rodents. *J. Nutr.* (1983) 113(5): 962-72.
- No Oral** Flannelly, K. J. and Blanchard, R. J. decreased aggressive and social responsiveness of chronically anosmic male rats. *Bulletin of the Psychonomic Society.* 19 (3). 1982. 173-176.
- No Oral** Flannelly, K. J. and Thor, D. H. territorial behavior of laboratory rats under conditions of peripheral anosmia. *Animal Learning and Behavior.* 4 (3). 1976 337-340.
- No Oral** Flannelly, Kevin J., Dupree, David A., and Thor, Donald H. social responsiveness and zinc-induced anosmia in rats : a replication. *Bull. Psychon. Soc.* (1977) 10(1): 63-5.
- Abstract** FLEET, J. C. and MCCORMICK, C. C. the effect of development and supplemental zinc on hepatic chick embryo metallothionein. *FED PROC FED AM SOC EXP BIOL* 46:595,1987
- CP** Fleet, J. C. and McCormick, C. C. 1988. the ontogeny and induction by zinc of hepatic chick embryo metallothionein. *Proceedings of the Society for Experimental Biology and Medicine;* 188
- Acu** Fleet, J. C., Qureshi, M. A., Dietert, R. R., and McCormick, C. C. 1988. tissue-specific accumulation of metallothionein in chickens as influenced by the route of zinc administration. *The Journal Of Nutrition.* 118(2): 176-182.
- CP** Fleet, James C. and McCormick, Charles C. the ontogeny and induction by zinc of hepatic chick embryo metallothionein. *Proc. Soc. Exp. Biol. Med.* (1988) 188(1): 52-60.
- Phys** Flenghi, L., Ye, B. H., Fizzotti, M., Bigerna, B., Cattoretti, G., Venturi, S., Pacini, R., Pileri, S., Lo Coco, F., Pescarmona, E., and et, a. l. 1995. a specific monoclonal antibody (pg-b6) detects expression of the bcl-6 protein in germinal center b cells. *American Journal of Pathology* 147(2): 405-11.
- CP** Flinchum, J. D., Nockels, C. F., and Moreng, R. E. aged hens fed zinc methionine had chicks with improved performance. *78TH ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC. POULT SCI.* 68 (Suppl. 1). 1989. 55.
- Herp** Flink Irwin L(A), Blitz Ira, and Morkin Eugene. 1998. characterization of cellular nucleic acid binding protein from xenopus laevis: expression in all three germ layers during early development. *Developmental Dynamics* 211(2): 123-130.
- Nut** Flipot, P. M. and Ouellet, G. 1988. mineral and nitrate content of swine drinking-water in four quebecregions. *Canadian Journal of Animal Science* 68(3): 997-1000.
- Drug** Floersheim, G. L. 1985. protection against acute ethanol toxicity in mice by zinc aspartate, glycols, levulose and pyritinol. *Agents and Actions* 16(6): 580-4.
- No Oral** Floersheim, G. L. radioprotective effects of calcium antagonists used alone or with other types of

radioprotectors. *Radiat. Res.* (1993) 133(1): 80-7.

- Org Met** Floersheim, G. L. synergism of organic zinc salts and sulfhydryl compounds (thiols) in the protection of mice against acute ethanol toxicity, and protective effects of various metal salts. *Agents Actions* (1987) 21(1-2): 217-22 .
- Drug** Floersheim, G. L., Bianchi, L., Probst, A., Chiodetti, N., and Honegger, C. G. 1984. influence of zinc, d-penicillamine and oxygen on poisoning with amanitaphalloides. zinc accelerates liver regeneration and prevents the depletion of brain noradrenaline caused by the mushroom. *Agents and Actions* 14(1): 124-130.
- Nut def** Floersheim, G. L., Bianchi, L., Probst, A., Chiodetti, N., and Honegger, C. G. influence of zinc, d-penicillamine and oxygen on poisoning with amanita phalloides. zinc accelerates liver regeneration and prevents the depletion of brain noradrenaline caused by the mushroom. *Agents Actions* (1984) 14(1): 124-30.
- Drug** Floersheim, G. L. and Floersheim, P. protection against ionizing radiation and synergism with thiols by zinc aspartate. *Br. J. Radiol.* (1986) 59(702): 597-602.
- No COC** Floersheim, George L. protection against acute ethanol toxicity in mice by zinc aspartate, glycols, levulose and pyritinol. *Agents Actions* (1985) 16(6): 580-4.
- No Oral** Flora, Govinder J. S., Kumar, Pradeep, and Seth, Prahlad K. recovery from lead induced biochemical and immunological alterations following combined treatment with dmsa and calcium disodium edta in rats. *Environ. Toxicol. Pharmacol.* (1998) 5(2): 127-134
- Unrel** Flora, S. J., Jeevaratnam, K., and Kumar, D. 1993. preventive effects of sodium molybdate in lead intoxication in rats. *Ecotoxicology and Environmental Safety* 26(2): 133-7.
- No Oral** Flora, S. J., Singh, S., and Tandon, S. K. 1989. thiamine and zinc in prevention or therapy of lead intoxication. *Journal of International Medical Research* 17(1): 68-75.
- Nut** Flora, S. J. S. influence of simultaneous supplementation of zinc and copper during chelation of lead in rats. *HUM EXP TOXICOL.* 10 (5). 1991. 331-336.
- Drug** Flora, S. J. S., Bhattacharya, R., and Sachan, S. R. S. dose-dependent effects of zinc supplementation during chelation of lead in rats. *Pharmacol. Toxicol. (Copenhagen)* (1994) 74(6): 330-3.
- Drug** Flora, S. J. S., Bhattacharya, R., and Vijayaraghavan, R. 1995. combined therapeutic potential of meso-2,3-dimercaptosuccinic acid and calcium disodium edetate on the mobilization and distribution of lead in experimental lead intoxication in rats. *Fundamental And Applied Toxicology.* 25(2): 233-240.
- Biom** Flora, S. J. S., Kumar, Deo, Sachan, S. R. S., and Das Gupta, S. combined exposure to lead and ethanol on tissue concentration of essential metals and some biochemical indexes in rat. *Biol. Trace Elem. Res.* (1991) 28(2): 157-64 .
- Drug** Flora, S. J. S., Singh, S., and Tandon, S. K. thiamin and zinc in prevention or therapy of lead intoxication. *J. Int. Med. Res.* (1989) 17(1): 68-75 .
- Phys** Flos, R. and Balasch, J. iron metabolism in stress: effect of acth and zinc. *Agressologie* (1977) 18(2): 47-53 .
- Phys** Flowers, S. W., Jamal, I. A., Bogden, J., Thanki, K., and Ballester, H. 1990. hypertension

induction in dahl rats. *Journal of the National Medical Association* 82(12): 837-40.

- IMM** Flynn, A. 1983. effects of antigen stimulation and interleukin-1 on invivo splenic zinc changes in the a/j mouse. *Journal Of The American College Of Nutrition* 2(3): 205-213.
- No Oral** Flynn, A. role of progesterone in zinc homeostasis. *IRCS Libr. Compend. (1973)* 1(2): 15.7.3 .
- CP** Flynn, A. and Brennan, M. M. ontogeny of iron and zinc absorption in the rat. *Trace Elem. Man Anim. 7: Monogr. Proc., Round Tables Discuss. Int. Symp., 7th* : Meeting Date 1990, 19-10-19/11. Editor(s): Momcilovic, Berislav. Publisher: Inst. Med. Res. Occup. Health Univ. Zagreb, Zagreb, Yugoslavia..
- Nut** Flynn, A., McKenna, L., Kearney, R. D., and Connolly, J. F. bioavailability of calcium and zinc in a whey mineral complex. *Irish Journal Of Food Science And Technology.* 1988. v. 12 (1/2) p. 41-51. charts.
- No Oral** Flynn, Arthur. effects of antigen stimulation and interleukin-1 on in vivo splenic zinc changes in the a/j mouse. *J. Am. Coll. Nutr. (1983)* 2(3): 205-13.
- Drug** Flynn, Arthur and Pories, Walter J. copper and copper enzymes in induced liver necrosis: a model of disease progression. *Trace Subst. Environ. Health (1976)* : 10, 469-74.
- Nut def** Focht, S., Fosmire, G., and Hymer, W. C. effects of zinc deficiency on pituitary somatotrophs. *75TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ATLANTA, GEORGIA, USA, APRIL 21-25, 1991. FASEB (FED AM SOC EXP BIOL) J.* 5 (5). 1991. A940.
- Nut def** Fogerty, A. C., Ford, G. L., Dreosti, I. E., and Tinsley, I. J. 1985. zinc deficiency and fatty acid composition of tissue lipids. *Nutrition Reports International.* 32(5): 1009-1019.
- Nut def** Follis, R. H. 1965. *The Pathology of Zinc Deficiency* : 2p.
- No COC** Folsom, J., Gange, R. W., and Mendelson, I. R. 1983. ornithine decarboxylase induction in psoralen-treated mouse epidermis used as a test of uv-a sunscreen potency. *British Journal of Dermatology* 108(1): 17-23.
- OAC** Fomenko, L. A., Bezlepkina, T. A., Anoshkin, A. N., and Gaziev, A. I. 1997. antioxidant vitamin diet decreases the rate of chromosomal damage and genic mutation in irradiated mice. *Izvestiya Akademii Nauk Seriya Biologicheskaya (Moscow)* 0(4): 419-424.
- Nut def** Fong, L. Y., Cheung, T., and Ho, Y. S. 1988. effect of nutritional zinc-deficiency on o6-alkylguanine-dna-methyl-transferase activities in rat tissues. *Cancer Letters* 42(3): 217-23.
- Carcin** Fong, L. Y., Lui, C. P., Ma-Tung, L., and Ng, W. L. 1987. zinc-deficiency and the development of malignant lymphoma in rats given a single intragastric dose of n-methyl-n-nitrosourea. *IARC Scientific Publications* (84): 261-3.
- Nut def** Fong, L. Y. Y., Lee, J. S. K., Chan, W. C., and Newberne, P. M. zinc deficiency and the induction of esophageal tumors in rats by benzylmethylamine and sodium nitrite. *IARC Sci. Publ. (1982)* 41(N-Nitroso Compd: Occurrence Biol. Eff.): 679-83.
- Nut def** Fong, L. Y. Y. and Newberne, P. M. nitrosobenzylmethylamine, zinc deficiency and esophageal cancer. *IARC Sci. Publ. (1978)* 19(Environ. Aspects N-Nitroso Compd.): 503-13.
- Nut def** Fong, L. Y. Y., Ng, W. L., and Newberne, P. M. n-nitrosodimethylamine-induced forestomach

tumors in male sprague-dawley rats fed a zinc-deficient diet. *IARC Sci. Publ. (1984)* 57(N-Nitroso Compd: Occurrence, Biol. Eff. Relevance Hum. Cancer): 543-6.

- Nut def** Fong, Louise Y. Y., Lui, C. P., Ng, W. L., and Newberne, P. M. 1986. the effect of n-nitrosodimethylamine and n-nitroso-n-benzylmethylamine on [3h]thymidine incorporation into the dna of target and non-target tissues in the zinc-deficient rat. *Cancer Lett. (Shannon Irel.)* 30(1): 61-71.
- FL** Fonseca, M. M., Rins de David, M. L., and Gendelman, H. 1989. [experimental sialadenitis in castrated rats administered estrogens]. <original> sialadenitis experimental en ratas castradas y aplicacion de estrogenos. *Revista De La Facultad De Odontologia* 17(1-2): 43-53.
- Drug** Fontaine, J., Neve, J., Peretz, A., Pelen, F., and Famaey, J. P. 1989. comparison of effects of chronic inflammation and long-term prednisolone administration on zinc metabolism in rats. *International Journal of Tissue Reactions* 11(5): 253-9.
- Unrel** Fontana, A., Bodmer, S., and Frei, K. 1985. [interleukin 1]. <original> interleukin-1. *Schweizerische Medizinische Wochenschrift. Journal Suisse De Medecine* 115(41): 1424-8.
- Nut def** Forbes, R. M. 1984. use of laboratory animals to define physiological functions and bioavailability of zinc. *Federation Proceedings* 43(13): 2835-9.
- No Control** Forbes, R. M., Erdman, J. W. Jr, Parker, H. M., Kondo, H., and Ketelsen, S. M. 1983. bio availability of zinc in coagulated soy protein tofu to rats and effect of dietary calcium at a constant phytate to zinc ratio. *Journal of Nutrition.* 113(1): 205-210.
- Nut** Forbes, Richard M. and Parker, Helen M. biological availability of zinc in and as influenced by whole fat soy flour in rat diets. *Nutr. Rep. Int. (1977)* 15(6): 681-8.
- Fate** Fordyce, E. J., Forbes, R. M., Robbins, K. R., and Erdman, J. W. 1987. phytate x calcium zinc molar ratios - are they predictive of zinc bioavailability. *Journal Of Food Science* 52(2): 440-444.
- Unrel** Forman, B. M., Yang, C. R., Au, M., Casanova, J., Ghysdael, J., and Samuels, H. H. 1989. a domain containing leucine-zipper-like motifs mediate novel in vivo interactions between the thyroid hormone and retinoic acid receptors. *Molecular Endocrinology* 3(10): 1610-26.
- No Oral** Forster, C., Parkes, J., and Cox, B. effects of olfactory bulbectomy and peripherally induced anosmia on thermo regulation in the rat susceptibility to anti depressant type drugs. *Journal of Pharmacy and Pharmacology.* 32 (9). 1980. 630-634.
- Herp** Fort, Douglas J. Oklahoma State Univ Stillwater, James, Brenda L., and Bantle, John A. evaluation of the developmental toxicity of five compounds with the. *J Appl Toxicol.* V9, N6, P377(12)
- CP** Fosmire, G. J. 1974. some effects of zinc-deficiency on postnatal cerebellar development in rat. *Federation Proceedings* 33: 662.
- Nut def** Fosmire, G. J. 1990. zinc toxicity. *American Journal of Clinical Nutrition* 51(2): 225-7.
- Nut def** Fosmire, G. J., Al-Ubaidi, Y. Y., Halas, E., and Sandstead, H. H. effect of zinc deprivation on the brain. *Adv. Exp. Med. Biol. (1974)* : 48, 329-45.
- Nut def** Fosmire, G. J., Al-Ubaidi, Y. Y., and Sandstead, H. H. effects of postnatal zinc deficiency on developing rat brain. *Pediatr. Res. (1975)* 9(2): 89-93

- Nut def** Fosmire, G. J., al-Ubaidi, Y. Y., and Sandstead, H. H. 1975. some effects of postnatal zinc deficiency on developing rat brain. *Pediatric Research* 9(2): 89-93.
- CP** Fosmire, G. J., Buell, S. J., and Sandstead, H. H. 1977. alterations in brain-development of suckling rat as a consequence of zinc-deficiency. *Federation Proceedings* 36: 1128.
- Abstract** Fosmire, G. J. and Fosmire, M. A. effects of aging on zinc absorption . 73RD ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, NEW ORLEANS, LOUISIANA, USA, MARCH 19-23, 1989. FASEB (FED AM SOC EXP BIOL) J. 3 (3). 1989. A651.
- Abstract** Fosmire, G. J. and Sandstead, H. H. alterations in post natal development of rat brain in response to zinc deficiency. *Proceedings of the North Dakota Academy of Science.* 29 (1). 1975 10
- Nut def** Fosmire, G. J. and Sandstead, H. H. alterations in protein synthesis in heart liver and kidney of zinc deficient suckling rat pups. *FED PROC. Federation Proceedings.* 34 (3). 1975 941
- Nut def** FOSMIRE, G. J. and SANDSTEAD, H. H. consequences of marginal zinc deficiency during gestation in the rat. *FED PROC FED AM SOC EXP BIOL* 37:890,1978
- CP** Fosmire, G J and Sandstead, H H. effects of zinc deficiency on compositional development and protein synthesis in liver, heart, and kidney of the suckling rat [reprinted from proceedings of the society for experimental biology and medicine]. *U S Agric Res Serv (Reprints Of Articles By Ars Employees)* 1977 154: 351-355. Ref.
- CP** Fosmire, G. J. and Sandstead, H. H. 1976. regional variation in brain-development in response to zinc-deficiency in suckling rat. *Federation Proceedings* 35: 682.
- Abstract** Fosmire, G. J. and Sandstead, H. H. some effects of zinc deficiency on post natal cerebellar development in the rat. *FED PROC. Federation Proceedings.* 33 (3 Part 1). 1974 662
- Nut def** Fosmire, Gary J., Fosmire, Mary Ann, and Sandstead, Harold H. zinc deficiency in the weanling rat . effects on liver composition and polysomal profiles. *J. Nutr.* (1976) 106(8): 1152-8.
- Nut def** Fosmire, Gary J., Greeley, Sharon, and Sandstead, Harold H. maternal and fetal response to various suboptimal levels of zinc intake during gestation in the rat. *J. Nutr.* (1977) 107(8): 1543-50.
- Nut def** Fosmire, Gary J. and Sandstead, Harold H. effects of zinc deficiency on compositional development and protein synthesis in liver, heart, and kidney of the suckling rat. *Proc. Soc. Exp. Biol. Med.* (1977) 154(3): 351-5.
- FL** Fosse, G. and Justesen, N. P. B. 1978. zinc and copper in bone and teeth of mice. *INTERNATIONAL JOURNAL OF ENVIRONMENTAL STUDIES* 12(2): 111-120.
- Bio Acc** Fosse, Gisle and Justesen, Nils Petter Berg. zinc and copper in bone and teeth of mice . *Int. J. Environ. Stud.* (1978) 12(2): 111-20 .
- No COC** Foster, P. M., Thomas, L. V., Cook, M. W., and Walters, D. G. 1983. effect of di-n-pentyl phthalate treatment on testicular steroidogenic enzymes and cytochrome p-450 in the rat. *Toxicology Letters* 15(2-3): 265-71.
- No COC** Foster, P. M. D., Foster, J. R., Cook, M. W., Thomas, L. V., and Gangolli, S. D. changes in ultrastructure and cytochemical localization of zinc in rat testis following the administration of di-n-pentyl phthalate. *Toxicology and Applied Pharmacology.* 63 (1). 1982. 120-132.

- No Oral** Foster, P. M. D., Thomas, L. V., Cook, M. W., and Gangolli, S. D. 1980. study of the testicular effects and changes in zinc excretion produced by some n-alkyl phthalates in the rat. *TOXICOLOGY AND APPLIED PHARMACOLOGY* 54(3): 392-398.
- No COC** Foster, W. H. 1978. an evaluation of food additives for broiler production. *British Poultry Science* 19(1): 55-59.
- No COC** Foster, W. H. a practical evaluation of 5 food additives likely to be used as growth promoters in broiler rations. *British Poultry Science*. 13 (2). 1972 123-131.
- No COC** Foster, W. H. and Stevenson, M. H. 1983. the interaction of food additives and protein content in broiler diets. *British Poultry Science* 24(4): 455-62.
- CP** Fournie-Zaluski, M. C., Soleilhac, J. M., Turcaud, S., Lai-Kuen, R., Crine, P., Beaumont, A., and Roques, B. P. 1992. development of [125i]rb104, a potent inhibitor of neutral endopeptidase 24.11, and its use in detecting nanogram quantities of the enzyme by "inhibitor gel electrophoresis". *Proceedings of the National Academy of Sciences of the United States of*
- CP** Fournie-Zaluski, M. C., Soleilhac, J. M., Turcaud, S., Lai-Kuen, R., Crine, P., Beaumont, A., and Roques, B. P. development of iodine-125 rb104 a potent inhibitor of neutral endopeptidase 24.11 and its use in detecting nanogram quantities of the enzyme by inhibitor gel electrophoresis. *Proceedings of the National Academy of Sciences of the United States of America*. 89 (14). 1992. 6388-6392.
- FL** Fournier, P. and Digaud, A. 1969. [effects in rats of simultaneous ingestion of lactose and 65zn on the absorption and retention of this element]. <original> effets chez le rat de l'ingestion simultanee de lactose et de 65zn sur l'absorption et la retention de cet element. *Comptes Rendus Hebdomadaires Des Seances De L'Academie Des Sciences*.
- FL** Fournier, P. and Digaud, A. 1971. [influence in the rat of the ingestion of lactose simultaneously with 65zn, on the utilization of this element]. <original> influence chez le rat de l'ingestion de lactose, simultanement avec du 65zn, sur l'utilisation de cet element. *Comptes Rendus Hebdomadaires Des Seances De L'Academie Des Sciences*.
- Acu** Fournier, Paul and Digaud, Alice. 1969. effects of simultaneous ingestion of lactose and zinc-65 on the absorption and retention of zinc in rats. *C. R. Acad. Sci. Ser. D* 269(20): 2001-3 .
- Rev** FOX, M. effect of essential minerals on cadmium toxicity: a review. *J FOOD SCI*; 39 (2). 1974 321-324.
- No COC** Fox, M. R. 1975. protective effects of ascorbic acid against toxicity of heavy metals. *Annals of the New York Academy of Sciences* 258: 144-50.
- Abstract** Fox, M. R. S., Fry, B. E. Jr, Schertel, M. E., and Harland, B. F. reduction of cadmium toxicity by dietary ascorbic-acid. *FED PROC. Federation Proceedings*. 29 (2). 1970 298
- CP** Fox, M. R. S., Tao S-H, Fry, B. E. Jr, Johnson, M. L., and Lee, Y. H. phytate zinc-magnesium interactions and bone development. *71ST ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, WASHINGTON, D.C., USA, MARCH 29-APRIL 2, 1987. FED PROC.* 46 (3). 1987. 884.
- Rev** Fox, M. R. Spivey. 1975. protective effects of ascorbic acid against toxicity of heavy metals. *Ann N Y Acad Sci*. 258: 144-50.
- Mix** Fox, M. R. Spivey, Jacobs, R. M., Jones, A. O. Lee, and Fry, Bert E. Jr. 1979. effects of

nutritional factors on metabolism of dietary cadmium at levels similar to those of man. *Environ. Health Perspect.* (28): 107-14.

- CP** Fox, M. R. Spivey, Tao, S. H., and Fry, B. E. Jr. atypical zinc deficiency in japanese quail fed two soy products. *Trace Elem. Man Anim. -- TEMA 5* Proc. Int. Symp., 5th (1985): Meeting Date 1984, 225-8. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK..
- Mix** Fox, M. R. Spivey, Tao, Shyy Hwa, Stone, Charles L., and Fry, Bert E. Jr. 1984. effects of zinc, iron and copper deficiencies on cadmium in tissues of japanese quail. *Environ. Health Perspect.* 54: 57-65
- CP** FOX, M. RS, TAO, S. H., FRY, B. E JR, and HAMILTON, R. P. 1980. interactions among zinc iron manganese copper and magnesium. *64TH ANNUAL MEETING OF THE FED. AM. SOC. EXP. BIOL.*
- Unrel** Fox, Thomas E., Fairweather-Tait, Susan J., Eagles, John, and Wharf, Gabrielle. assessment of zinc bioavailability: studies in rats on zinc absorption from wheat using radio- and stable isotopes. *Br. J. Nutr.* (1994) 71(1): 95-101.
- Nut def** Fraker, P. and King, L. 1998. changes in regulation of lymphopoiesis and myelopoiesis in the zinc-deficient mouse. *Nutrition Reviews.* 56(1,pt.2): S65-S69.
- Nut def** Fraker, P. J., DePasquale-Jardieu, P., Zwickl, C. M., and Luecke, R. W. 1978. regeneration of t-cell helper function in zinc-deficient adult mice. *Proceedings of the National Academy of Sciences of the United States America* 75(11): 5660-5664.
- Nut def** Fraker, P. J., Depasquale-Jardieu, P., Zwickl, C. M., and Luecke, R. W. regeneration of thymus derived cell helper function in zinc deficient adult mice. *Proceedings of the National Academy of Sciences of the United States of America.* 75 (11). 1978. 5660-5664.
- Rev** Fraker, P. J., Gershwin, M. E., Good, R. A., and Prasad, A. 1986. interrelationships between zinc and immune function. *Federation Proceedings - Federation Of American Societies For Experimental Biology.* 45(5): 1474-1479.
- Nut def** Fraker, P. J., Jardieu, P., and Cook, J. 1987. zinc deficiency and immune function. *Archives of Dermatology* 123(12): 1699-701.
- Nut def** Fraker, P. J., King, L., and Garvy, B. 1993. alteration of lymphopoiesis by zinc deficiency: a possible role for apoptosis. *Journal of the American College of Nutrition* 12(5): 578.
- Nut def** Fraker, P. J., King, L. E., Garvy, B. A., and Medina, C. A. the immunopathology of zinc deficiency in humans and rodents. a possible role for programmed cell death. *Human Nutrition : A Comprehensive Treatise.* 1993. v. 8 p. 267-283.
- IMM** Fraker, P. J. and Luecke, R. W. 1976. dietary zinc - its effects on immune-response of a-j mice. *Journal Of Nutrition* 106: R20.
- Abstract** Fraker, P. J. and Luecke, R. W. 1980. effect of dietary zinc-deficiency on immunity in the inbred mouse. *Abstracts Of Papers Of The American Chemical Society 1980, V179, Mar, P30-Agfd*
- CP** Fraker, P. J. and Luecke, R. W. 1977. effects of dietary zinc on t-cell helper function of a-j mouse. *Federation Proceedings* 36: 1176.
- Abstract** Fraker, P. J. and Luecke, R. W. the effects of dietary zinc on thymus derived cell helper function

of the a-j mouse. *Federation Proceedings*. 36 (3). 1977 1176

- Nut def** Fraker, P. J., Osati-Ashtiani, F., Wagner, M. A., and King, L. E. 1995. possible role for glucocorticoides and apoptosis in the suppression of lymphopoiesis during zinc deficiency: a review. *Journal Of The American College Of Nutrition*. 14(1): 11-17.
- Nut def** Fraker, Pamela J., Caruso, Ralph, and Kierszenbaum, Felipe. alteration of the immune and nutritional status of mice by synergy between zinc deficiency and infection with trypanosoma cruzi. *J. Nutr.* (1982) 112(6): 1224-9.
- Nut def** Fraker, Pamela J., DePasquale-Jardieu, Paula, Zwicky, Craig M., and Luecke, Richard W. regeneration of t-cell helper function in zinc-deficient adult mice. *Proc. Natl. Acad. Sci. U. S. A.* (1978) 75(11): 5660-4.
- Nut def** Fraker, Pamela J., Hilderbrandt, Kim, and Luecke, Richard W. alteration of antibody-mediated responses of suckling mice to t-cell-dependent and independent antigens by maternal marginal zinc deficiency: restoration of responsivity by nutritional repletion. *J. Nutr.* (1984) 114(1): 170-9.
- Nut def** Fraker, Pamela J. and Leucke, R. W. effect of dietary zinc deficiency on lymphocyte function in the mouse. *Adv. Exp. Med. Biol.* (1981) 135(Diet Resist. Dis.): 107-19.
- Nut def** Fraker, Pamela J., Zwicky, Craig M., and Luecke, R. W. delayed type hypersensitivity in zinc deficient adult mice : impairment and restoration of responsivity to dinitrofluorobenzene. *J. Nutr.* (1982) 112(2): 309-13.
- IMM** Franceschi, C., Chiricolo, M., Licastro, F., Zannotti, M., Masi, M., Mocchegiani, E. , and Fabris, N. 1988 . oral zinc supplementation in downs-syndrome - restoration of thymic endocrine activity and of some immune defects. *Journal Of Mental Deficiency Research* 1988, V32, Jun, P169-181
- Rev** Franchini, A. and Bertuzzi, S. 1991. micronutrients and immune functions. 63-80.
- Drug** Francis, C., Janky, D. M., Arafa, A. S., and Harms, R. H. 1978. the effect of adding a lactobacillus culture to the diet of laying hens and turkey poults upon performance and microbiology of feed and intestinal tract. *Poultry Science*. 57 (4). 1137
- Drug** Francis, C., Janky, D. M., Arafa, A. S., and Harms, R. H. 1978. interrelationship of lactobacillus and zinc bacitracin in the diets ofturkey poults. *Poultry Science* 57(6): 1687-1689.
- CP** Franklin, A. J(A), Magnuson, M. A., and Rickman, D. W(A). 1995. localization of bzip, a zinc finger transcriptional repressor, in the developing rat retina. *Investigative Ophthalmology & Visual Science* 36(4): S467.
- Fate** Franklin, P. A., Pullen, R. G., and Hall, G. H. 1992. blood-brain exchange routes and distribution of 65zn in rat brain. *Neurochemical Research* 17(8): 767-71.
- Unrel** Franquin, J. C. and Salomon, J. P. 1986. [methodology of a standard technic for evaluating bone biocompatibility of canal filling materials: ii. histologic results on 2 materials: gutta percha and zinc oxide eugenol]. <original> methologie d'une technique normalisee pour l'evaluation de la biocompatibilite osseuse des materiaux d'obturation canalaire: ii. resultats histologiques sur deux materiaux: la gutta-percha et l'oxyde de zinc eugenol. *L' Information Dentaire* 68(33): 3197-209.
- Bio Acc** Franson, J. Christian, Koehl, Philip S., Derksen, Dirk V., Rothe, Thomas C., Bunck, Christine M.,

and Moore, John F. 1995. heavy metals in seaducks and mussels from misty fjords national monument in southeast alaska. *Environ. Monit. Assess.* 36(2): 149-67 .

- Drug** Franti, C. E., Julian, L. M., and Adler, H. E. 1973. antibiotic growth promotion: effects of zinc bacitracin and oxytetracycline on live weight and weights of selected muscles of newhamphshire cockerels. *Poultry Science* 52(5): 1757-1765.
- Drug** Franti, C. E., Julian, L. M., Adler, H. E., and Wiggins, A. D. 1972. antibiotic growth promotion: effects of zinc bacitracin and oxytetracycline on the digestive, circulatory, and excretory systems of new hamphshire cockerels. *Poultry Science* 51(4): 1137-45.
- FL** Frantova, E., Ofukany, L., Mraz, A., Korcek, M., and Blanar, M. 1986. monensin poisoning in swine. *Veterinarstvi* 36(6): 270-272.
- Food** Franz, K. B., Kennedy, B. M., and Fellers, D. A. 1980. relative bioavailability of zinc from selected cereals and legumes using rat growth. *Journal of Nutrition* 110(11): 2272-83.
- Nut def** Franzen, L. and Agren, M. effect of zinc deficiency on connective tissue repair in the perforated rat mesentery. *Journal of Trace Elements in Experimental Medicine.* 4 (1). 1991. 37-50.
- Unrel** Franzen Lennart E(A), Ghassemifar, M. Reza, Salerud Goran, and Tarpila Erkki. 1996. actin fiber orientation in connective tissue contraction: a quantitative study with the perforated rat mesentery model. *Wound Repair and Regeneration* 4(4): 454-460.
- CP** Freake, H. C(A), Huang, C., and Zinn, S. A. 1998. zinc and thyroid hormone interactions in vivo. *FASEB Journal* 12(4): A218.
- CP** Frederickson, C. J., Danscher, G., Cravens, K. J., Slomianka, L., and Sylvan, L. B. staining for zinc reveals columnar patches in the hippocampus of the newborn rat. *21ST ANNUAL MEETING OF THE SOCIETY FOR NEUROSCIENCE, NEW ORLEANS, LOUISIANA, USA, NOVEMBER 10-15, 1991. SOC NEUROSCI ABSTR.* 17 (1-2). 1991. 1131.
- No Oral** Frederickson, C. J., Gage, F. H., Howell, G. A., Stewart, G. R., Kesslak, J. P., Stuart, P. R., and Klitenick, M. A. a possible role of mossy fiber zinc in sympathetic sprouting. *Neurol. Neurobiol.* (1984) 11A(Neurobiol. Zinc, Part A): 173-87 .
- No COC** FREDERICKSON, C. J., HERNANDEZ, M. D., and MCGINTY, J. F. translocation of zinc may contribute to seizure-induced death of neurons. *BRAIN RES;* 480 (1-2). 1989. 317-321.
- Unrel** Frederickson, C. J., Howell, G. A., and Frederickson, M. H. zinc dithizonate staining in the cat hippocampus relationship to the mossy fiber neuropil and post natal development. *EXP NEUROL. Experimental Neurology.* 73 (3). 1981. 812-823.
- In Vit** Frederickson, C. J., Howell, G. A., Haigh, M. D., and Danscher, G. 1988. zinc-containing fiber systems in the cochlear nuclei of the rat and mouse. *Hearing Research* 36(2-3): 203-11.
- Org Met** Frederickson, C. J., Perez-Clausell, J., and Danscher, G. 1987. zinc-containing 7s-ngf complex. evidence from zinc histochemistry for localization in salivary secretory granules. *Journal of Histochemistry and Cytochemistry* 35(5): 579-83.
- Rev** Frederickson, C. J A and Moncrieff, D. W. 1994. zinc-containing neurons. *Biological Signals* 3(3): 127-139.
- Abstract** FREDERICKSON, R. E., DANSCHER, G., and FREDERICKSON, C. J. 1986. reversible chelation of hippocampal zinc causes time-locked disruption of spatial-working memory. *16TH*

ANNUAL MEETING OF THE SOCIETY FOR NEUROSCIENCE

- CP** Freeland-Graves, Jeanne. zinc nutriture and vegetarian diets. *Adv. Diet Nutr.* [Int. Congr.], 1st (1985): Meeting Date 1983, 227-31. Editor(s): Horwitz, Crystal. Publisher: Libbey, London, UK..
- Nut def** Freeman, R. M. and Taylor, P. R. CS Veterans Administration Hospital City Iowa 52240 USA. 1977. influence of histidine administration on zinc metabolism in the rat. *American Journal of Clinical Nutrition* 50(4): 523-527.
- No Oral** Freeman, Richard M., Richards, Carl J. , and Rames, Linda K. 1975. zinc metabolism in aminonucleoside-induced nephrosis. *Am. J. Clin. Nutr.* (1975) 28(7): 699-703 .
- No Oral** Freeman, Richard M. and Taylor, Philip R. 1977. influence of histidine administration on zinc metabolism in the rat. *Am. J. Clin. Nutr.* 30(4): 523-7 .
- No Oral** Fregoneze, J. B., Ferreira, H., Soares, T., Luz, C. P., Bulcao, C., Nascimento, T., Marinho, C. A., Sarmiento, C., De Oliveira, I. R., Cunha, M., and De Castro e Silva, E. 1995. sdz 216-525, a selective 5-HT₁ sub(a) receptor antagonist, reverts zinc-induced inhibition of water intake in dehydrated rats. *Vol. 28, No. 6, Pp. 711-714 Braz. J. Med. Biol. Res.*
- No Oral** Fregoneze, J. B., Souza, C., Cunha, M., Ferreira, H., De-Oliveira, I., Barros, L., Malbouisson, M., and De-Castro-E-Silva, E. acute effect of intracerebroventricular administration of zinc on the drinking behavior of rats induced by dehydration or central cholinergic and angiotensinergic stimulation. *Braz. J. Med. Biol. Res.* (1994) 27(11): 2623-33 .
- Abstract** Freitas, A. A. and Rocha, B. 1997. lymphocyte survival: a red queen hypothesis [see comments]. *Science* 277(5334): 1950.
- No COC** French, M. C. Haines C. W. and Cooper J. 1987. investigation into the effects of ingestion of zinc shot by mallard ducks (*Anas platyrhynchos*). *Environ.Pollut.* 47: 305-314.
- Unrel** French, N. P., Morgan, K. L., and Fell, C. 1990. wool slip in wiltshire horns. *Veterinary Record* 127(10): 267.
- Meth** Friedberg, F. 1978. Radioimmunoassay of Metallothionein. *EPA/600/1-78/010*
- BioX** Friederich, C. and Tu, A. T. 1971. role of metals in snake venoms for hemorrhagic, esterase and proteolytic activities. *Biochemical Pharmacology* 20(7): 1549-56.
- Nut def** FRIEDMAN, M. advances in experimental medicine and biology, vol. 48. protein-metal interactions. *ADV EXP MED BIOL; 1974 (RECD 1975) 692*
- Alt** Friedman, M. I., Emmerich, A. L., and Gil, K. M. 1980. effects of insulin on food intake and plasma glucose level in fat-fed diabetic rats. *Physiology & Behavior* 24(2): 319-25.
- No COC** Friedman, M. I. and Ramirez, I. 1987. insulin counteracts the satiating effect of a fat meal in rats. *Physiology & Behavior* 40(5): 655-9.
- FL** Friess, A. E. and Liebig, H. G. 1972. [electron microscopy studies of ductus thoracicus cells of the rat after osmium-zinc-jodide (ozi) impregnation]. <original> elektronenmikroskopische untersuchungen an zellen des ductus thoracicus der ratte nach osmium-zink-jodid (ozi) impragnation. *Zeitschrift Fur Zellforschung Und Mikroskopische Anatomie* 133(4)
- No COC** Frigg, M A, Straub, O. C., and Hartmann, D A. 1993. the bioavailability of supplemental biotin in cattle. *International Journal for Vitamin and Nutrition Research* 63(2): 122-128.

- Nut def** Friis, H., Andersen, C. B., Vennervald, B. J., Christensen, N. O., and Pakkenberg, B. 1998. the use of a stereological method to estimate the volume of schistosoma mansoni granulomas: the effect of zinc deficiency. *Annals of Tropical Medicine and Parasitology* 92(7): 785-92.
- Nut** Frimpong, N. A. and Magee, A. C. 1987. effects of dietary copper and zinc on serum lipid parameters of young male rats. *Nutrition Reports International*. 35(3): 551-559.
- CP** Frimpong, N. A. and Magee, A. C. 1987. effects of dietary zinc and copper supplementation on growth, liver zinc, copper and iron status of young sprague-dawley male-rats. *Federation Proceedings* 46: 596.
- CP** Frimpong, N. A. and Magee, A. C. 1986. effects of dietary zinc and copper supplementation on serum triglyceride, total-cholesterol and hdl-cholesterol concentrations on young sprague dawley male-rats . *Federation Proceedings* 45: 231.
- Abstract** Frimpong, N. A. and Magee, A. C. effects of dietary zinc and copper supplementation on serum triglyceride total-cholesterol and high-density lipoprotein-cholesterol concentration in young sprague-dawley male rats. *70TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 13-18, 1986. FED PROC.* 45 (3). 1986. 231.
- CP** Frimpong, N. A., Zwick, D., and Tulp, O. L. effects of zinc intake on food intake weight gain growth patterns and serum t3 in lain-cp rats. *74TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, PART I, WASHINGTON, D.C., USA, APRIL 1-5, 1990. FASEB (FED AM SOC EXP BIOL) J.* 4 (3). 1990. A387.
- Mix** Frimpong, Nesba A. and Magee, Aden C. effects of dietary copper and zinc on serum lipid parameters of young male rats. *Nutr. Rep. Int.* (1987) 35(3): 551-9 .
- Diss** Frimpong, Nesba Ama. 1985. the effects of zinc and copper supplementation on growth , lipid profiles, and trace mineral status in young male rats. *Avail.: Univ. Microfilms Int. Order No. DA8529421 From: Diss. Abstr. Int. B* 1986, 46. 11. 3789. 88 pp.
- In Vit** Frisch, S. M., Chu, R. C., and Hall, C. A. 1976. hematological changes in rats fed excess dietary zinc. *Clinical Research* 24: A631.
- Alt** Fritsch, H., Schimpf, Kl., Lenhard, J., Ritz, E., and Urban, V. serum transaminases and serum zinc in dietetic-induced liver cirrhosis in rats . observations during the developmental process. *Acta Hepatol-Splenol.* (1971) 18(4): 286-94.
- Unrel** Froetschel, M. A., Martin, A. C., Amos, H. E., and Evans, J. J. 1990. effects of zinc sulfate concentration and feeding frequency on ruminalprotozoal numbers, fermentation patterns and amino acid passage insteers. *Journal of Animal Science* 68(9): 2874-2884.
- CP** Frolich, W. and Sandstrom, B. 1983. zinc-absorption from composite meals. *Acs Symposium Series* 210: 211-221.
- Nut def** Froslic, A., Ulvund, M. J., Maina, J. N., and Norheim, G. trace elements in grass cattle liver and sheep liver from districts surrounding karatina kenya 2. copper molybdenum zinc and sulfur. *Nordisk Veterinaermedicin.* 35 (5-6). 1983. 213-218.
- CP** Frost, P., Chen, J. C., Rabbani, I., Smith, J., and Prasad, A. S. the effect of zinc deficiency on the immune response. *BREWER, GEORGE J. AND ANANDA S. PRASAD (ED.). PROGRESS IN CLINICAL AND BIOLOGICAL RESEARCH, VOL. 14. ZINC METABOLISM. CURRENT*

ASPECTS IN HEALTH AND DISEASE. PROCEEDINGS OF A SYMPOSIUM. FORT LAUDERDALE, FLA., USA, NOV. 11-12, 1976. XI+365P. ILLUS. ALAN R. LISS, INC.: NEW YORK, N.Y., USA. ISBN 0-8451-0014-9. 1977 143-158

- FL** Froyshov, O., Pedersen, S., and Hove, K. 1986. absorption, metabolism and excretion of zinc 14c-bacitracin fed toyounng pigs. *Journal of Animal Physiology and Animal Nutrition* 55(2): 100-110.
- No COC** Frye, G. D., Fincher, A. S., Grover, C. A., and Griffith, W. H. 1994. interaction of ethanol and allosteric modulators with gabaa-activated currents in adult medial septum/diagonal band neurons. *Brain Research* 635(1-2): 283-92.
- No COC** Frye, Gerald D., Fincher, Annette S., Grover, Cathy A., and Jayaprabhu, Sudheer. lanthanum and zinc sensitivity of gabaa-activated currents in adult medial septum/diagonal band neurons from ethanol dependent rats. *Brain Res. (1996)* 720(1,2): 101-110 .
- CP** Fryer, A. J., Ku, P. K., Miller, E. R., and Ullrey, D. E. effect of elevated dietary zinc on growth performance of weanling swine. *MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE AND AMERICAN DAIRY SCIENCE ASSOCIATION, MIDWESTERN SECTION, DES MOINES, IOWA, USA, MARCH 23-25, 1992. J ANIM SCI.* 70 (Suppl. 1). 1992. 62.
- FL** Fu, W. and Guo, R. effects on lactating rats fed an excessive zinc diet hippocampal development of their pups. *Journal of Xi'An Medical University.* 12 (4). 1991. 303-306.
- FL** Fu, Wenyu and Guo, Renyu. effects of dietary zinc excess to lactating rats on hippocampal development of their pups. *Xi'an Yike Daxue Xuebao (1991)* 12(4): 303-6 .
- Drug** Fu, Wenyu and Guo, Renyu. effects of feeding histidine to lactating rats on hippocampal development and enzyme activity of their pups. *Yingyang Xuebao (1999)* 21(3): 340-343.
- No Oral** Fuchimoto, Takeshi, Watanabe, Masanori , Fujii, Masataka, Takashima, Masanari, and Hiraoka, Hiroshi. the effect of zinc on the central nervous system: increase in brain excitability and initiation of seizures following systemic and intracerebral administration of zinc. *Bull. Yamaguchi Med. Sch. (1967)* 14(1): 67-78 .
- Gene** Fuchs, B., Wagner, T., Rossel, N., Antoine, M., Beug, H., and Niessing, J. 1997. structure and erythroid cell-restricted expression of a chicken cDNA encoding a novel zinc finger protein of the cys + his class [published erratum appears in gene 1998 jan 5;206(1):151]. *Gene* 195(2): 277-84.
- FL** Fuchs, V., Golbs, S., Kuhnert, M., Schopeck, W., and Stier, B. 1982. [effect of humic acids on selected trace elements in laboratory rats]. <original> untersuchungen zum einfluss von huminsauren auf ausgewahlte spurenelemente bei laboratoriumsrratten. *Archiv Fur Experimentelle Veterinarmedizin* 36(2): 187-91.
- BioX** Fugina, L. G. and Makarov, V. V. sensitivity of viral growth to zinc ions. *Dokl. Vses. Akad. S-Kh. Nauk Im. V. I. Lenina (1985)* (3): 38-9.
- Carcin** Fujibayashi, Keizo, Suzuki, Keiko, Miyake, Noriko, Baba, Kazuhiko, Suzuki, Kazutomo, Arakawa, Yasuyuki, Matsuo, Yutaka, Tomioka, Echiko, Mano, Motoko, and et al. changes of trace metals during experimental hepatic carcinoma development. *Biryo Kinzoku Taisha (1989)* (17): 83-6 .
- Org Met** Fujibayashi, Y., Saji, H., Yomoda, I., Suzuki, K. H., Torizuka, K., and Yokoyama, A. 1986. a new approach toward a pancreas-seeking zinc radiopharmaceutical. i. accumulation of 65zn-amino

acid and aminopolycarboxylic acid complexes in pancreatic tissue slices. *European Journal of Nuclear Medicine* 11(12): 484-7.

- In Vit** Fujibayashi, Y., Saji, H., Yomoda, I., Suzuki, K. H., Torizuka, K., and Yokoyama, A. a new approach toward a pancreas-seeking zinc radiopharmaceutical i. accumulation of zinc-65 amino-acid and aminopolycarboxylic-acid complexes in pancreatic tissue slices. *European Journal of Nuclear Medicine*. 11 (12). 1986. 484-487.
- Surv** Fujikawa, H. Japan Racing Association Tokyo. Equine Research Inst., Asai, Y., Mizuno, Y., and Yamamoto, O. 1993. the survey of calcium, copper and zinc contents in the pasture grass and epiphysitis of foals on breeding farms. *Bulletin of Equine Research Institute*. (No.30) P. 1-4
- Abstract** Fujikawa, K., Tawara, K., Harada, S., and Takayama, S. 1994. nursing disorder caused by administration of gadodiamide hydrate (gh) during fetal organogenesis in rats. *Toxicologist* 14(1): 78.
- In Vit** Fujimoto Sadaki(A), Okano Isako, Tanaka Yutaka, Sumida Yasuo, Tsuda Jyunji, Kawakami Naoko, and Shimohama Shun. 1996. zinc-ion-dependent acid phosphatase exhibits magnesium-ion-dependent myo-inositol-1-phosphatase activity. *Biological & Pharmaceutical Bulletin* 19(6): 882-885.
- Nut def** Fujimoto, Shigehiro, Indo, Yasuhiro, Higashi, Akimasa, Matsuda, Ichiro, Kashiwabara, Norio, and Nakashima, Ichiro. conversion of thyroxine into tri-iodothyronine in zinc deficient rat liver. *J. Pediatr. Gastroenterol. Nutr.* (1986) 5(5): 799-805.
- Nut def** Fujimura, Kaori. teratogenic effects of short-term maternal zinc deficiency during pregnancy in mice. *Eiyogaku Zasshi* (1998) 56(3): 149-158.
- FL** Fujita, Daisuke. effect of cadmium on lipid components. relation of cadmium to thyroid hormone and growth hormone. *Nippon Eiseigaku Zasshi* (1992) 47(3): 704-14
- FL** Fujita, Masahiko and Nakazawa, Hiroyuki . toxicity of green patina (basic cupric carbonate). ii. effect of chronic exposure to basic cupric carbonate on levels of copper, iron and zinc in tissues of rats. *Shokuhin Eiseigaku Zasshi* (1985) 26(6): 617-23.
- In Vit** Fujiwara, Masahiro, Ando, Hisanori, Tanaka, Mutsuo, and Souma, Yoshie. 1995. hydrogenation of carbon dioxide over cu-zn-chromate/zeolite composite catalyst: the effects of reaction behavior of alkenes on hydrocarbon synthesis. *Appl. Catal. A* 130(1): 105-16 .
- Nut def** Fukahori, Motofumi and Itoh, Masatoshi. effects of dietary zinc status of seizure susceptibility and hippocampal zinc content in the e1 (epilepsy) mouse. *Brain Res.* (1990) 529(1-2): 16-22
- No Oral** Fukawa, K., Ito, Y., Ohbayashi, S., Iwadate, K., Irino, O., and et, a. l. 1998. new method for the local irritation test. part 2. skin irritation test for powder drugs. *J. Pharm. Soc. Jap. (Yakugaku Zasshi)* 102 ISS Jan 1982
- Drug** Fukino, H., Hirai, M., Hsueh, Y. M., Moriyasu, S., and Yamane, Y. 1986. mechanism of protection by zinc against mercuric-chloride toxicity in rats - effects of zinc and mercury on glutathione metabolism. *Journal Of Toxicology And Environmental Health* 19(1): 75-89.
- Mix** Fukino, H., Hirai, M., Hsueh, Y. M., and Yamane, Y. 1984. effect of zinc pretreatment on mercuric chloride-induced lipid peroxidation in the rat-kidney. *Toxicology And Applied Pharmacology* 73(3): 395-401.
- Nut def** Fukino, Hideki, Hirai, Masami, Ideura, Kazuhiko, Saki, Kazuo, and Yamane, Yasuhiro. effect of

the administration of mercuric chloride on zinc deficiency in rats. *Shokuhin Eiseigaku Zasshi* (1992) 33(1): 31-8.

- Prim** Fuks, A. B., Michaeli, Y., Sofer-Saks, B., and Shoshan, S. enriched collagen solution as a pulp dressing in pulpotomized teeth in monkeys. *Pediatric Dentistry*. 6 (4). 1984 (Recd. 1985). 243-247.
- No COC** FUKUDA, S. and IIDA, H. toxicological study on the safety of dtpa as a drug. 1.teratological study in the rat. *HOKEN BUTSURI(J JPN HEALTH PHYS SOC)* 18:37-42,1983
- Nut** Fukui, Kensuke, Kuwata, Gorou, and Imai, Masatake. 1997. effects of phytate removal from soybean protein on calcium, magnesium, and zinc absorption of rats. *Nippon Eiyo Shokuryo Gakkaishi* 50(4): 273-278.
- In Vit** Fukumoto, M., Yoshida, M., Kishimoto, T., Yamamura, Y. Y., Sakai, O., and Shimizu, N. effect of zinc, selenium and calcium on the nephrotoxicity of cadmium in primary cultures of rat renal proximal epithelial cells. *Biomed. Res. Trace Elem.* (1992) 3(2): 149-50.
- Alt** Fukuta, Yasuhiko, Isegawa, Jyunichi, Matsuda, Akihiko, and Kokuba, Yukifumi. correlation between intravenously supplied energy level and zinc metabolism in laparotomized rats. *J. Nutr. Sci. Vitaminol.* (1997) 43(6): 657-663.
- CP** Fukuyama, R., Chandrasekaran, K., Galdzicki, Z., Stoll, J., and Rapoport, S. I. alteration in the level of app by chemical treatment in cultured cells a probe to study the possible cellular function of app. *THIRD INTERNATIONAL CONFERENCE ON ALZHEIMER'S DISEASE AND RELATED DISORDERS, ABANO TERME, ITALY, JULY 12-17, 1992. NEUROBIOL AGING*. 13 (Suppl. 1). 1992. S104-S105.
- Nut def** Fuller, N. J., Evans, P. H., Howlett, M., and Bates, C. J. 1988. the effects of dietary folate and zinc on the outcome of pregnancy and early growth in rats. *Br. J. Nutr.* 59(2): 251-9.
- Phys** Fullerton, H. J., Ditelberg, J. S., Chen, S. F., Sarco, D. P., Chan, P. H., Epstein, C. J., and Ferriero, D. M. 1998. copper/zinc superoxide dismutase transgenic brain accumulates hydrogen peroxide after perinatal hypoxia ischemia. *Annals of Neurology* 44(3): 357-64.
- Gene** Funahashi, J. I., Sekido, R., Murai, K., Kamachi, Y., and Kondoh, H. 1993. delta -crystallin enhancer binding protein delta ef1 is a zinc finger-homeodomain protein implicated in postgastrulation embryogenesis. *Vol. 119, No. 2, Pp. 433-446 Development*
- Gene** Fung, Y. W., Wang, R., and Liew, C. C. 1996. characterization of a human cardiac gene which encodes for a lim domain protein and is developmentally expressed in myocardial development. *Journal of Molecular and Cellular Cardiology* 28(6): 1203-10.
- No COC** Fungwe, T. V., Buddingh, F., Yang, M. T., and Yang, S. P. 1989. hepatic, placental, and fetal trace elements following molybdenum supplementation during gestation. *Biological Trace Element Research* 22(2): 189-99.
- No COC** Fungwe, Thomas V., Buddingh, Fred, Yang, Meiling T., and Yang, Shiang P. hepatic, placental, and fetal trace elements following molybdenum supplementation during gestation. *Biol. Trace Elem. Res.* (1989) 22(2): 189-99.
- No COC** Funke, P. J., Tunn, U. W., Senge, T., and Neumann, F. 1982. effects of the antioestrogen tamoxifen on steroid induced morphological and biochemical changes in the castrated dog prostate. *Acta Endocrinologica* 100(3): 462-72.

- Rev** Furness, R. W. 1996. cadmium in birds. 389-404.
- No COC** Furniss, D. E., Hurrell, R. F., and Finot, P. A. 1986. modification of urinary zinc excretion in the rat associated with the feeding of maillard reaction products. *Acta Pharmacol. Toxicol. Suppl.* 59(7): 188-90.
- No COC** Furniss, D. E., Vuichoud, J., Finot, P. A., and Hurrell, R. F. 1989. the effect of maillard reaction products on zinc metabolism in the rat. *The British Journal Of Nutrition.* 62(3): 739-749.
- CP** Furniss, Diane E., Hurrell, R. F., De Weck, Daniele, and Finot, P. Andre. 1985. the effect of lysinoalanine and .epsilon.-fructosyl lysine on kidney, liver and urine trace elements in the rat. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th* : Meeting Date 1984, 544-6. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK..
- Abstract** FURUTA, H., ENDO, Y., and OGURA, Y. changes of poly amines in rat testis induced by cadmium. *JPN J PHARMACOL; 25 (SUPPL). 1975 (RECD 1976) 54P-55P*
- Prim** Furuta, S., Toyama, S., Miwa, M., Ikeda, Y., Sano, H., and Matsuda, K. study on the metabolic fate of catena-s-mu-n-alpha-3-aminopropionylhistidinato-n-1 n-2 o n-tau-zinc 4th communication. disposition of zinc and amino acids in rats dogs and monkeys. *Arzneimittel-Forschung.* 41 (9). 1991. 992-995.
- Fate** Furuta Shigeru(A), Suzuki Michio, Toyama Seiji, Miwa Masahiro, and Sano Hiroshi. 1999. tissue distribution of polaprezinc in rats determined by the double tracer method. *Journal of Pharmaceutical and Biomedical Analysis* 19(3-4): 453-461.
- Unrel** Fuse, H., Sakamoto, M., Okumura, M., and Katayama, T. 1992. epidermal growth factor contents in seminal plasma as a marker of prostatic function. *Archives of Andrology* 29(1): 79-85.
- Nut def** Fushimi, Hisako, Inoue, Toru, Yamada, Yuya, Horie, Hiroaki, Kameyama, Masakuni, Inoue, Kaoru, Minami, Takeshi, and Okazaki, Yuko. zinc deficiency exaggerates diabetic osteoporosis. *Diabetes Res. Clin. Pract.* (1993) 20(3): 191-196.
- CP** Fuson, K. S., Boggs, L. N., and May, P. C. 1996. zinc attenuates amyloid beta (a-beta)1-40 neurotoxicity. *Society for Neuroscience Abstracts* 22(1-3): 195.
- FL** Gabai, V. L., Mosina, V. A., Makarova, I. u. M., Maliutina, I. a. V., Budagova, K. R., and Mosin, A. F. 1995. [lack of serum causes apoptosis of thymocytes not requiring protein synthesis and atp generation]. <original> lishenie syvorotki vyzyvaet apoptoz timotsitov, ne trebuiushchii sinteaz belka i generatsii atp. *Biokhimiia* 60(8): 1201-8.
- In Vit** Gabai, V. L., Mosina, V. A., Makarova, Yu. M., Malutina, Ya. V., Budagova, K. R., and Mosin, A. F. serum withdrawal results in thymocyte apoptosis which does not require protein synthesis and atp generation. *Biokhimiya (Moscow)* (1995) 60(8): 1201-8.
- Nut def** Gabliks, J., Nauss, K., and Newberne, P. 1985. increased severity of influenza a virus infection in zinc-deficient mice. *Nutrition Reports International.* 31(4): 911-917.
- No COC** Gabraschanski, P. and Daskalova, A. 1976. studies on ubiquinones in healthy and diseased birds. *Monatshefte Fur Veterinarmedizin* 31(12): 464-467.
- No Dose** Gabrashanska, M. and Daskalova, A. comparative studies on the levels of the trace-elements selenium and zinc in poultry experimentally infested with the nematode ascaridia-galli. *Khelmintologiya.* 20 (0). 1985 (Recd. 1986). 15-23.

- Acu** Gabrashanska, M., Galvez Morros, M. M., Garcia Martinez, O., <Editors> Anke, M. , and Meissner, D. 1994. application of mixed basic salts of copper and zinc to ascaridiagalli-infected chicks. <Document Title> *Megen- Und Spurenelemente. 14. Arbeitstagung, Jena* 25./26. November 1994. 513-517.
- Alt** Gabrashanska, M., Teodorova, S., Galvez-Morros, M., and Martinez, O. Garcia. 1999. a kinetic model for ascaridia galli populations in chickens treated with mixed salts of copper and zinc. *J. Helminthol.* 73(1): 45-50 .
- Drug** Gabrashanska, M. and Timanova-Gospodinova, A. eeffect of some salts of zn: [zn5(oh)8cl2.h2o and znso4.7h2o] during experimental infection with ascaridia galli (nematoda). *Dokl. Bulg. Akad. Nauk.* (1993) 46(6): 93-5.
- Mineral** Gabryszuk, M. 1994. the effect of selected minerals and vitamin e on the reproduction ofthe polish merino sheep. 1. content of macro- and microelements inblood plasma, feeds and drinking water. *Animal Science Papers and Reports - Polish Academy of Sciences, Institute of Genetics and Animal Breeding Jastrzebiec* 12(1): 39-46.
- In Vit** Gachot Bertrand, Tauc Michel, Wanstok Frida, Morat Luc, and Poujeol Philippe(A). 1994. zinc transport and metallothionein induction in primary cultures of rabbit kidney proximal cells. *Biochimica Et Biophysica Acta* 1191(2): 291-298.
- Invert** Gadomska, K. 1996. effect of zinc on invasive capacity and reproduction of nippostrongylus brasiliensis (nematoda) in rats. *Wiadomosci Parazytologiczne* 42(4): 429-34.
- Nut def** Gaetani, S., Vignolini, F., and Spadoni, M. A. effect of different dietary phytate/zinc molar ratio on zinc status in "catch-up" rats. *Nutr. Rep. Int.* (1984) 30(1): 111-20 .
- No Oral** Gahlot, T. K. and Chouhan, D. S. 1988. histomorphological evaluation of fracture healing followingadministration of zinc, anabolic hormone and ascorbic acid in dogs. *Haryana Agricultural University Journal of Research* 18(3): 160-166.
- IMM** Gainer, J. H. 1977. effects of heavy metals and of deficiency of zinc on mortality rates in mice infected with encephalomyocarditis virus. *Am. J. Vet. Res.* 38(6): 869-72 .
- Unrel** Gaintantzopoulou, M. D., Willis, G. P., and Kafrawy, A. H. 1994. pulp reactions to light-cured glass ionomer cements. *American Journal of Dentistry* 7(1): 39-42.
- Carcin** Galatulas, Iraklis and Bossa, Rosaria. effect of zinc supplementation on the antitumoral activity and toxicity of adriamycin in mice. *IRCS Med. Sci.* (1986) 14(9): 942-3 .
- Fate** Galazyn-Sidorczuk, M., Brzoska, M. M., Moniuszko-Jakoniuk, J., and Kowalczyk, M. 1998. the influence of ethanol on zinc concentration in cd-exposed rats. *Pol. J. Environ. Stud.* 7(1): 11-15 .
- Phys** Galcheva Gargova, Z., Konstantinov, K. N., Wu, I Huan, Klier, F. G., Barrett, T., and Davis, R. J. 1996. binding of zinc finger protein zpr1 to the epidermal growth factor receptor. *Vol. 272, No. 5269, Pp. 1797-1802 Science (Wash.)*
- No Oral** Gale, Thomas F. the amelioration of mercury-induced embryotoxic effects by simultaneous treatment with zinc. *Environ. Res.* (1984) 35(2): 405-12
- FL** Galibois, I., Desrosiers, T., Guevin, N., Lavigne, C., and Jacques, H. effects of dietary fiber mixtures on glucose and lipid metabolism and on mineral absorption in the rat. *Ann. Nutr. Metab.* (1994) 38(4): 203-11.

- FL** Galibois, I., Desrosiers, T., Guevin, N., Lavigne, C., and Jacques, H. 1994. effects of dietary fibre mixtures on glucose and lipid metabolism and on mineral absorption in the rat. *Annals of Nutrition & Metabolism* 38(4): 203-11.
- Nut def** Gallaher, D. and Hurley, L. S. 1980. low zinc concentration in rat uterine fluid after 4 days of dietary deficiency. *Journal of Nutrition* 110(3): 591-3.
- Nut def** Gallaher, Daniel and Hurley, Lucille S. low zinc concentration in rat uterine fluid after 4 days of dietary deficiency. *J. Nutr. (1980)* 110(3): 591-3
- Nut def** Gallant, K. R. and Cherian, M. G. 1986. influence of maternal mineral deficiency on the hepatic metallothionein and zinc in newborn rats. *Canadian Journal Of Biochemistry And Cell Biology = Revue Canadienne De Biochimie Et Biologie Cellulaire*. 64(1): 8-12.
- Nut def** Gallant, K. R. and Cherian, M. G. 1989. metabolic changes in glutathione and metallothionein in newborn rat liver. *Journal of Pharmacology and Experimental Therapeutics* 249(2): 631-7.
- Nut def** Gallant, Karen R. and Cherian, M. George. changes in dietary zinc result in specific alterations of metallothionein concentrations in newborn rat liver. *J. Nutr. (1987)* 117(4): 709-16
- No Oral** Gallant, Karen R. and Cherian, M. George. metabolic changes in glutathione and metallothionein in newborn rat liver. *J. Pharmacol. Exp. Ther. (1989)* 249(2): 631-7.
- FL** Gallardo, N. S. P., Barba, M. C. P., Ayub, A. O., Del Villar Velasco, J. L., Uribe, P. I., Cortes, R. B. P., Villasenor, K. T., and Villasenor, G. T. 1996. preliminary studies of the biocompatibility of the zinalco alloy. <original title> estudio preliminar de la biocompatibilidad de la aleacion zinalco. Vol. 27, No. 4, Pp. 325-329 Veterinaria Mexico
- Carcin** Gallet, A., Angelats, C., Erkner, A., Charroux, B., Fasano, L., and Kerridge, S. 1999. the c-terminal domain of armadillo binds to hypophosphorylated teashirt to modulate wingless signalling in drosophila. *EMBO Journal* 18(8): 2208-17.
- Unrel** Gallet, A., Erkner, A., Charroux, B., Fasano, L., and Kerridge, S. 1998. trunk-specific modulation of wingless signalling in drosophila by teashirt binding to armadillo. *Current Biology* 8(16): 893-902.
- FL** Galli, G., Allegrini, M., Alessi, G., and Lanzola, E. 1981. effect of diets rich in maize oil, zinc and copper on platelet aggregation in the rabbit. *Bollettino Della Societa Italiana Di Biologia Sperimentale* 57(18, bis): 154.
- FL** Galvao, F. E., De Mello R P, and Silva, R. M. effect of zinc supplementation on milking cow diet. *Arquivos Da Escola De Veterinaria Universidade Federal De Minas Gerais*. 25 (3). 1973 (Recd 1974) 235-241.
- Food** Galvez-Morros, M., Garcia-Martinez, O., Wright, A. J. A., and Southon, S. bioavailability in the rat of zinc and iron from basic salts. *Food Chemistry*. 43 (5). 1992. 377-381.
- Drug** Galyuk, S. V. use of copper and cobalt microdoses in the complex treatment of experimental rickets. *Patol. Fiziol. Eksp. Ter. (1978)* (5): 72-3 .
- No Oral** Ganai, Y., Macias, D., Garcia-Martinez, V., and Hurle, J. M. in vivo experimental induction of interdigital tissue chondrogenesis in the avian limb bud results in the formation of extradijits. effects of local microinjection of staurosporine, zinc chloride and growth factors. *Prog. Clin. Biol. Res. (1993)* 383A(Limb Development and Regeneration, Pt. A): 127-39.

- Nut def** Gandor, D. W., Fanslow, D. J., and Meyer, J. 1983. effects of zinc deficiency on developmental changes in alkaline phosphatase and carbonic anhydrase activities in the submandibular gland of the rat. *Archives of Oral Biology* 28(7): 609-15 .
- Nut def** Gandor, D. W., Fanslow, D. J., and Meyer, Julia. effects of zinc deficiency on developmental changes in alkaline phosphatase and carbonic anhydrase activities in the submandibular gland of the rat. *Arch. Oral Biol.* (1983) 28(7): 609-15.
- FL** Gangler, P. 1977. [comparative vital microscopic and histological studies on the mechanism of action of the dental pulp capping materials calcium hydroxide and zinc-oxide-eugenol]. <original> vergleichende vitalmikroskopische und histologische untersuchungen zum wirkungsmechanismus der pulpauberkappungsmittel kalziumhydroxid und zinkoxid-eugenol. *Zahn-, Mund-, Und Kieferheilkunde Mit Zentralblatt* 65(4): 376-91 .
- No Oral** Gangrade, B. K. and Dominic, C. J. 1983. effect of zinc sulfate-induced anosmia on estrous-cycle of the laboratory mice. *Indian Journal Of Experimental Biology* 21(8): 425-427.
- No COC** GARBAN, Z., EREMIA, I., NEMES, R., PRECOB, V., and STEFAN, C. homeostasis changes induced by the action of ethanol on the materno-fetal complex in rats. 3.the effects of ethanol supplemented by a zn-salt. *REV ROUM MORPHOL EMBRYOL PHYSIOL:MORPHOL EMBRYOL* 32:165-174,1986
- Abstract** GARBAN, Z., VOICULESCU, L., CHECIU, M., and EREMIA, J. the action of zn and co upon dna synthesis and serum proteins during prenatal development of albino rats. *TERATOLOGY* 29(3):23A-24A,1984
- No Oral** Garban, Z., Voiculescu, Livia, Checiu, Maria, and Eremia, Iulia. the influence of zinc and cobalt on the deoxyribonucleic acid biosynthesis and on the genetic information transmission in experimental animals. ii. effect on the serum protein biosynthesis and on the embryony development. *Rev. Roum. Biochim.* (1984) 21(2): 109-17 .
- FL** Garcia Arranz, M. T. and Latorre, J. L. 1974. kinetics of zinc in eggs. *Avances En Alimentacion y Mejora Animal* 15(3/4): 77-80.
- CP** Garcia-Compean, W. Tamez, Bermudez, V., Torres, O., Gomez, G., Acavedo, E. E., and Barragan, R. F. 1994. protective effect of zinc sulfate (zs) on mortality, narcosis and hepatocellular necrosis due to acute ethanol intoxication. *Gastroenterology* 106(4 SUPPL.): A1027.
- CP** Garcia-Domingo, D., Leonardo, E., Grandien, A., Martinez, P., Albar, J. P., Izpisua-Belmonte, J. C., and Martinez-A, C. 1999. dio-1 is a gene involved in onset of apoptosis in vitro, whose misexpression disrupts limb development. *Proceedings of the National Academy of Sciences of the United States of*
- Unrel** Garcia-Godoy, F. 1982. a comparison between zinc oxide-eugenol and polycarboxylate cements on formocresol pulpotomies. *Journal of Pedodontics* 6(3): 203-17.
- Nut def** Garcia Partida, P., Gutierrez Panizo, C., and Vega, F. D. Alonso de. 1985. experimental chronic zinc deficiency in sheep: clinical and histological picture. *Anales De Veterinaria De Murcia* 1: 181-188.
- Nut def** Garcia Partida, P., Gutierrez Panizo, C., and Vega, F. D. Alonso de. 1985. haematology of experimental zinc deficiency in sheep. *Anales De Veterinaria De Murcia* 1: 167-180.
- Bact** Garcia, Penarrubia M P, Cremades, Campos A, Sanchez, Vera J L, and Campos, Aranda M.

influence of the administration of d penicillamine and copper plus deferrioxamine on experimental infection with salmonella-typhimurium. *Infectologika*. 7 (2). 1986. 46-51.

- Phys** Garg, A., Singh, R., and Kumar, U. lipid peroxidation and divalent cation-induced experimental epilepsy. *GEOBIOS (JODHPUR)*. *GEOBIOS (Jodhpur)*. 17 (4). 1990. 145-148.
- No COC** Garg, S. K. Singh H. Ram H. and Chandna S. S. 1984. aldicarb (temika) and carbofuran (furadan) granules as rodenticides. *Agric.Sci.Dig.* 4(2): 99-101.
- No COC** Garje, V. D(A), Talvelkar, B. A., Mantri, A. M., and Deshmukh, B. T. 1999. effect of exogenous bovine somatotropin on sodium, potassium and chloride contents of milk in lactating crossbred cows. *Indian Journal of Animal Sciences* 69(7): 482-484.
- Anat** Garrett, B., Geneser, F. A., and Slomianka, L. 1991. distribution of acetylcholinesterase and zinc in the visual cortex of the mouse. *Anatomy and Embryology* 184(5): 461-8.
- Anat** Garrett, B. and Slomianka, L. 1992. postnatal development of zinc-containing cells and neuropil in the visual cortex of the mouse. *Anatomy and Embryology* 186(5): 487-96 .
- BioX** Garrett, B. J., Holtan, D. W., Cheeke, P. R., Schmitz, J. A., and Rogers, Q. R. 1984. effects of dietary supplementation with butylated hydroxyanisole, cysteine, and vitamins b on tansy ragwort (*senecio jacobaea*) toxicosis in ponies. *American Journal of Veterinary Research* 45(3): 459-464.
- HHE** Garrett, S. H., Somji, S., Todd, J. H., Sens, M. A., and Sens, D. A. 1998. differential expression of human metallothionein isoform i mrna in human proximal tubule cells exposed to metals. *Vol. 106, No. 12, Pp. 825-832 Environmental Health Perspectives*
- CP** Gasanov, C. I. 1991. stimulation of reproductive-immunobiological functions of buffalofemales in the region of north azerbaijan characterized by biogeochemical deficiency. *Proceedings of World Buffalo Congress* (3): 734-736.
- Bio Acc** Gasch, A. T., Michaelis, O. E., Douglass, L. W., and Moser, P. B. 1984. blood zinc, copper, insulin and glucose-levels in carbohydrate-sensitive and normal men given a sucrose or invert sugar tolerance-test. *Nutrition Research* 4(6): 967-976.
- Unrel** Gaskin, P. W(A), Hall, S. B., and Williams, D. R(A). 1993. an interfacial equilibria model for the electrokinetic properties of a fat emulsion: part ii. magnesium, zinc and proton interactions with the interface. *Chemical Speciation and Bioavailability* 5(1): 23-30.
- In Vit** Gasparyan, G. G. and Grigoryan, R. M. 1993. a possible way of the mitogenic signal transfer during contact stimulation of the cultured cell growth. *Tsitologiya* 35(1): 65-69.
- Phys** Gasull, T., Giralt, M., Garcia, A., and Hidalgo, J. 1994. regulation of metallothionein-i+ii levels in specific brain areas and liver in the rat: role of catecholamines. *Vol. 12, No. 2, Pp. 135-143 Glia*
- Phys** Gasull, T., Rebollo, D. V., Romero, B., and Hidalgo, J. 1993. development of a competitive double antibody radioimmunoassay for rat metallothionein. *Journal of Immunoassay* 14(4): 209-25.
- No Oral** Gasull, Teresa, Giralt, Mercedes, Hernandez, Joaquin, Martinez, Paz, Bremner, Ian, and Hidalgo, Juan. regulation of metallothionein concentrations in rat brain: effect of glucocorticoids, zinc, copper, and endotoxin. *Am. J. Physiol.* (1994) 266(5, Pt. 1): E760-E767 .

- Aquatic** Gatlin, D. M. iii and Wilson, R. P. dietary zinc requirement of fingerling channel catfish *ictalurus-punctatus*. *J NUTR. Journal of Nutrition*. 113 (3). 1983. 630-635.
- Drug** Gatzke, H. D. and Wildmeister, W. auto radiographic investigations on protein metabolism and histochemical studies on zinc content in the brain in diabetes mellitus 1. streptozotocin induced diabetes. *Endokrinologie*. 74 (3). 1979 (Recd. 1980). 323-346.
- FL** Gatzke, H. D. and Wildmeister, W. 1979. [autoradiographic studies on protein metabolism and histochemical demonstration of the brain zinc content in diabetes mellitus. 1. comparison in experimental streptozotocin-induced diabetes]. <original> autoradiographische untersuchungen zum proteinstoffwechsel und histochemische nachweise zum zinkgehalt des gehirns bei diabetes mellitus. 1. mitteilung: verhaltnisse beim experimentellen durch streptozotocin induzierten diabetes. *Endokrinologie* 74(3): 323-46.
- Nut def** Gaudette, Douglas C., Driscoll, Eric R., and Bettger, William J. dietary zinc deficiency alters the content and fatty acid composition of phosphatidylinositol bis-phosphate (pip2) in the rat erythrocyte membrane. *J. Nutr. Biochem.* (1992) 3(6): 309-12.
- Nut** Gaudio, E., Pannarale, L., Franchitto, A., and Riggio, O. zinc supplementation in experimental liver cirrhosis: a morphological, structural and ultrastructural study. *Int. J. Exp. Pathol.* (1993) 74(5): 463-9.
- Nut** Gaziev, A. I., Podlitsky, A. J. a., Panfilov, B. M., and Bradbury, R. 1995. dietary supplements of antioxidants reduce hpert mutant frequency in splenocytes of aging mice. *Mutation Research* 338(1-6): 77-86.
- Nut def** Gbodi, T. A. and Ndife, L. 1982. some observations on chemotherapy of bovine dermatophilosis. *British Veterinary Journal* 138(4): 288-294.
- FL** Gebert, S., Bee, G., Pfirter, H. P., and Wenk, C. 1999. phytase and vitamin e in the feed of growing pigs, 1: influence on growth, mineral digestibility and fatty acids in digesta. <original> zulage von phytase und vitamin e zum schweinemastfutter, 1: einfluss auf wachstum, mineralstoffverwertung und fettsauren im chymus. *Journal of Animal Physiology and Animal Nutrition*. V. 81(1) P. 9-19
- Bact** Gebert, Stefan A, Bee, Giuseppe, Pfirter, Hans Peter, and Wenk, Caspar. 1999. growth performance and nutrient utilisation as influenced in pigs by microbial phytase and vitamin e supplementation to a diet of high oxidative capacity. *Annales De Zootechnie (Paris)* 48(2): 105-115.
- No COC** GEBHARDT, D. O. and VAN LOGTEN MJ. the chick embryo test as used in the study of the toxicity of certain dithiocarbamates. *TOXICOL APPL PHARMACOL* 13:316-324,1968
- Nut def** Gee, J. M., Johnson, I. T., and Southon, S. 1984. structural and functional changes in the jejunal mucosa of the zinc-deficient rat. *Journal of Physiology* 348: 65P.
- Unrel** Geeson, N. A., Abrahams, P. W., Murphy, M. P., and Thornton, I. 1998. fluorine and metal enrichment of soils and pasture herbage in the oldmining areas of derbyshire, uk. *Agriculture, Ecosystems & Environment* 68(3): 217-231.
- FL** Gegenava, L. G., Svanidze, I. K., Mosulishvili, I. M., and Rcheulishvili, A. N. kinetics of changes in zinc and copper concentrations in the rat hippocampus during ontogenesis. *Izv. Akad. Nauk Gruz. Ser. Biol.* (1990): 16(6), 387-90.
- FL** Gegenava, L. G., Svanidze, I. K., Mosulishvili, L. M., and Rcheulishvili, A. N. alteration

dynamics of zinc and copper concentration in the rat hippocampus during ontogenesis. *IZV AKAD NAUK GRUZ SER BIOL.* 16 (6). 1990. 387-390.

- Gene** Geier, G. and Zwilling, R. 1998. cloning and characterization of a cdna coding for astacus embryonic astacin, a member of the astacin family of metalloproteases from the crayfish astacus astacus. *European Journal of Biochemistry* 253(3): 796-803.
- Nut def** Geiger, J. D., Wallwork, J. C., Seth, P. K., Sandstead, H. H., and Parmar, S. S. effects of zinc deficiency and food restriction on receptor binding in rat brain regions. *Biol. Mem. (1985)* 10(1-2): 50-5.
- Alt** Geiger Kathrin, Howes Ed, Gallina Marijo, Huang Xiao Jian, Travis Gabriel H, and Sarvetnick Nora(A). 1994. transgenic mice expressing ifn-gamma in the retina develop inflammation of eye and photoreceptor loss. *Investigative Ophthalmology & Visual Science* 35(6): 2667-2681.
- In Vit** Geist, S. 1995. investigations on the trace element supply of breeding mares and the influence of a mixture of yeast cultures and mineral proteinates on mare fertility. 127 pp.
- No Dose** Genge, B. R., Sauer, G. R., Wu, L. N., McLean, F. M., and Wuthier, R. E. 1988. correlation between loss of alkaline phosphatase activity and accumulation of calcium during matrix vesicle-mediated mineralization. *Journal of Biological Chemistry* 263(34): 18513-9.
- CP** Gengelbach, G. P., Droke, E. A., and Spears, J. W. influence of dietary zinc level and source and stress on zinc status and immune responses in growing lambs. *MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE, SOUTHERN SECTION, LEXINGTON, KENTUCKY, USA, FEBRUARY 2-5, 1992. J ANIM SCI.* 70 (Suppl. 1). 1992. 32.
- FL** Gennaro Soffietti, M. Cattedra di Tossicologia Veterinaria Torino Italy, Nebbia, C., Biolatti, B., Re, G., Castagnaro, M., Cottino, F., and Guarda, F. Torino Università Italy Dipartimento di Patologia Animale. 1988. toxicology of fungicides: effects of 270 days administration of zinc ethylene-bis-dithiocarbamate in friesian cattle. *Schweizer Archiv Fuer Tierheilkunde.* V. 130(12) P. 657-672
- CP** Gentle, M. J. oral behavior in response to oral stimulation in gallus-domesticus. *STEINER, J. E. AND J. R. GANCHROW (ED.). DETERMINATION OF BEHAVIOUR BY CHEMICAL STIMULI; PROCEEDINGS OF THE 5TH EUROPEAN CHEMORECEPTION RESEARCH ORGANIZATION SYMPOSIUM, JERUSALEM, ISRAEL, NOV. 8-12, 1981. VII+287P. IRL PRESS LIMITED: LONDON, ENGLAND. ILLUS. PAPER. ISBN 0-904147-33-9. 0 (0). 1982. P127-136.*
- Nut def** Gentle, M. J., Dewar, W. A., and Wight, P. A. L. the effects of zinc deficiency on oral behavior and taste bud morphology in chicks. *Br. Poult. Sci. (1981)* 22(3): 265-73 2 plates.
- Acu** Gentle, M. J., Dewar, W. A., Wight, P. A. L., and Dick, K. M. the effects of high dietary zinc on food intake in the domestic fowl. *Appetite (London) (1982)* 3(1): 53-60.
- HHE** Georgiadis, K. E., Hirohata, S., Seldin, M. F., and Apte, S. S. 1999. adam-ts8, a novel metalloprotease of the adam-ts family located on mouse chromosome 9 and human chromosome 11. *Vol. 62, No. 2, Pp. 312-315 Genomics*
- Mineral** Georgievskii, V. I., Ivanov, A. A., Gurtskaya, M. T., and Dzhevakhishvili, Z. U. 1991. metabolism of minerals and vitamins in black pied primiparous cows on adiet containing different amounts of zinc. *Izvestiya Timiryazevskoi Sel'Skoghozyaistvennoi Akademii* (3): 145-155.
- FL** Georgievskii, V. I., Khazin, D. A., and Polyakova, E. P. 1981. retention of major- and trace

elements in broilers in relation to the trace element content of the diet. *Sel'Skokhozyaistvennaya Biologiya* 16(3): 446-449.

- FL** Georgievskii, V. I., Polyakova, E. P., Khazin, D. A., and Smirnova, L. D. 1993. distribution of trace elements in tissues of broiler chickens on a diet containing different levels of magnesium. *Izvestiya Timiryazevskoi Sel'Skokhozyaistvennoi Akademii* (No.1): 123-131.
- FL** Georgijevsky V. I., Polyakova, E. P., Khazin, D. A., and Smirnova, L. D. redistribution of microelements in tissues of chicken -broilers with different level of magnesium in the ration. *Izv. Timiryazevsk. S-Kh. Akad.* (1993) (1): 123-31.
- Drug** Gergel Dalibor and Cederbaum Arthur I(A). 1996. inhibition of the catalytic activity of alcohol dehydrogenase by nitric oxide is associated with S-nitrosylation and the release of zinc. *Biochemistry* 35(50): 16186-16194.
- HHE** Gerhardsson, L., Brune, D., Nordberg, G. F., and Wester, P. O. 1986. distribution of cadmium, lead and zinc in lung, liver and kidney in long-term exposed smelter workers. *Science Of The Total Environment* 1986, V50, Apr, P65-85
- HHE** Gershoff, S. N., McGandy, R. B., Nondasuta, A., Pisolyabutra, U., and Tantiwongse, P. nutrition studies in thailand part 3 trace minerals in human and rat hair . *American Journal of Clinical Nutrition.* 30 (6). 1977 868-872.
- Prim** Gershwin, M. E. zinc deprivation and teratogenesis. *Crisp Data Base National Institutes of Health*
- Nut def** Gershwin, M. E., Lentz, D. R., Beach, R. S., and Hurley, L. S. 1984. nutritional factors and autoimmunity. iv. dietary vitamin A deprivation induces a selective increase in IgM autoantibodies and hypergammaglobulinemia in new zealand black mice. *Journal of Immunology* 133(1): 222-6.
- Abstract** Gerson, S., Meyer, J., and Gandor, D. effect of added zinc on explants of rat oral epithelium. *ANNUAL SESSION OF THE AMERICAN ASSOCIATION FOR DENTAL RESEARCH, CINCINNATI, OHIO, USA, MAR. 17-20, 1983. J DENT RES.* 62 (Spec. Issue). 1983. 240.
- Nut def** Gerson, Stanley J. and Meyer, Julia. increased lactate dehydrogenase activity in buccal epithelium of zinc-deficient rats. *J. Nutr.* (1977) 107(5): 724-9
- Nut def** Gerson, Stanley J., Meyer, Julia, and Gandor, Daniel. decreased zinc concentration does not lead to atrophy of rat oral epithelium. *J. Nutr.* (1985) 115(6): 820-3.
- Unrel** Gertler, A., Grosclaude, J., Strasburger, C. J., Nir, S., and Djiane, J. 1996. real-time kinetic measurements of the interactions between lactogenic hormones and prolactin-receptor extracellular domains from several species support the model of hormone-induced transient receptor dimerization. *Journal of Biological Chemistry* 271(40): 24482-91.
- FL** Gervetovskii, A. and Vasilenok, V. 1973. effect of excess calcium on the development of piglets. *Svinovodstvo* (6): 20.
- Nut def** Geurin, H. B. 1981. liver vitamin A slow release syndrome in cattle with a multiple nutrient imbalance. *Journal of Animal Science* 53(3): 758-764.
- FL** GEVONDYAN, A. R. study of the combined action of zinc copper and lead in intragastric administration. *GIG SANIT;* 0 (10). 1990. 90.

- CP** Gezer Semra(A), Kirkali Guldal(A), Pekcetin Cetin, and Gure Ataman. 1998. the effects of pre- and post natal copper depletion on mitochondrial cytochrome oxidase activities of newborn rats. *Biochemical Society Transactions* 26(4): S350.
- HHE** Ghavamimaibodi, S. Z., Collipp, P. J., Castromagana, M., Stewart, C., and Chen, S. Y. 1983. effect of oral zinc supplements on growth, hormonal levels, and zinc in healthy short children. *Annals Of Nutrition And Metabolism* 27(3): 214-219.
- FL** Ghergariu, S. and Kadar, L. behavior of copper iron and zinc blood levels in sick bovines 1. changes in neo natal diarrhea. *Zentralblatt Fuer Veterinaermedizin Reihe A.* 26 (8). 1979. 666-670.
- FL** Ghergariu, S. and Kadar, L. behavior of copper iron and zinc levels in blood of sick cattle 2. changes in lung diseases in young cattle. *Zentralblatt Fuer Veterinaermedizin Reihe A.* 26 (8). 1979. 671-675.
- FL** Ghergariu, S. and Kadar, L. 1979. behaviour of cu, fe and zn blood levels in diseased cattle. i. changes in neonatal diarrhoea. ii. changes during respiratory disease in young cattle. *Zentralblatt Fur Veterinarmedizin* 26A(8): 666-675.
- Unrel** Ghishan, F. K. and Greene, H. L. 1983. fetal alcohol syndrome: failure of zinc supplementation to reverse the effect of ethanol on placental transport of zinc. *Pediatric Research* 17(7): 529-31.
- Abstract** Ghishan, F. K., Patwardhan, R., and Greene, H. L. fetal alcohol syndrome a mechanism for growth retardation. *ANNUAL MEETING OF THE AMERICAN PEDIATRIC SOCIETY AND THE SOCIETY FOR PEDIATRIC RESEARCH, SAN FRANCISCO, CALIF., USA, APRIL 28-MAY 1, 1981. PEDIATR RES.* 15 (4 Part 2). 1981. 533.
- Unrel** Ghishan, F. K., Patwardhan, R., and Greene, H. L. 1982. fetal alcohol syndrome: inhibition of placental zinc transport as a potential mechanism for fetal growth retardation in the rat. *Journal of Laboratory and Clinical Medicine* 100(1): 45-52.
- Nut** Ghishan, F. K. and Sobo, G. 1983. intestinal maturation - invivo zinc transport. *Pediatric Research* 17(2): 148-151.
- Alt** Ghishan, F. K. LIFSA and Greene, H. L. 1983. intestinal transport of zinc in the diabetic rat. *Life Sciences.* 32 (15): 1735-1741.
- Nut** Ghishan, F. K. NURIB, Pierce, E., Meneely, R., and Patwardhan, R. 1983. maternal-fetal exchange during protein malnutrition: placental transfer of zinc (rats). *Nutrition Reports International.* 27 (3): 547-550.
- Unrel** Ghishan, Faye K. and Greene, Harry L. fetal alcohol syndrome: failure of zinc supplementation to reverse the effect of ethanol on placental transport of zinc. *Pediatr. Res. (1983)* 17(7): 529-31.
- BioAcc** Ghishan, Faye K. and Sobo, Gwenn. intestinal maturation: in vivo zinc transport. *Pediatr. Res. (1983)* 17(2): 148-51.
- Mix** Ghishan, Faye K., Stroop, Steve, and Meneely, Raymond. the effect of lactose on the intestinal absorption of calcium and zinc in the rat during maturation. *Pediatr. Res. (1982)* 16(7): 566-8.
- CP** Ghossein, C., Lopez-Guisa, J. M., Karp, S., and Neilson, E. G. 1997. a novel zinc finger protein

expressed in mature tubular epithelium. *Journal of the American Society of Nephrology* 9(PROGRAM AND ABSTR. ISSUE): 358A-359A.

- Org Met** Giavini, E., Vismara, C., and Broccia, M. L. 1983. pre- and postimplantation embryotoxic effects of zinc dimethyldithiocarbamate (ziram) in the rat. *Ecotoxicology and Environmental Safety* 7(6): 531-7.
- Org Met** Giavini, E. Vismara C. and Broccia M. L. 1983. pre- and postimplantation embryotoxic effects of zinc dimethyldithiocarbamate (ziram) in the rat. *Ecotoxicol. Environ. Saf.* 7: 531-537.
- Nut def** Gibbons, J. P., Morford, L. A., and Fraker, P. J. alterations of postnatal immune development in the mouse by marginal gestational zinc deficiency. *Journal of Trace Elements in Experimental Medicine.* 2 (1). 1989. 31-44.
- Phys** Gibbs, John W. III, Shumate, Melissa D., and Coulter, Douglas A. differential epilepsy-associated alterations in postsynaptic gabaa receptor function in dentate granule and ca1 neurons. *J. Neurophysiol.* (1997) 77(4): 1924-1938.
- Abstract** Gibson, M. L. and Males, J. R. effect of crude protein level with or without zinc methionine on ruminal ammonia-nitrogen and volatile fatty acid concentrations over time. *ANNUAL MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE, NEW BRUNSWICK, NEW JERSEY, USA, JULY 19-22, 1988. J ANIM SCI.* 66 (Suppl. 1). 1988. 486-487.
- Bio Acc** Gibson, R. S., Anderson, B. M., and Scythes, C. A. 1983. regional differences in hair zinc concentrations - a possible effect of water hardness. *American Journal Of Clinical Nutrition* 37(1): 37-42.
- Abstract** Gibson, W. B. the importance of dose frequency to zinc pyridinethione induced paralysis. *18TH ANNUAL MEETING OF THE SOCIETY OF TOXICOLOGY, NEW ORLEANS, LA., USA, MAR. 11-15, 1979. TOXICOL APPL PHARMACOL.* 48 (1 Part 2). 1979. A42.
- Acu** Gibson W.B., Jeffcoat A.R., Turan T.S., Wendt R.H., Hughes P.F., and Twine M.E. 1982. zinc pyridinethione: serum metabolites of zinc pyridinethione in rabbits, rats, monkeys, and dogs after oral dosing. *TOXICOL. APPL. PHARMACOL* VOL. 62, NO. 2: pp. 237-250.
- No Org** Gidas, M.-B., Garnier, O., and Gidas, N. K. performance of chitosan as a primary coagulant for the wastewater treatment. *Prog. Water Resour.* (1999) 1(Water Pollution V): 47-56.
- Nut def** Gilabert, E. R., Ruiz, E., Osorio, C., and Ortega, E. effect of dietary zinc deficiency on reproductive function in male rats : biochemical and morphometric parameters. *J. Nutr. Biochem.* (1996) 7(7): 403-407.
- No COC** Gilani, S. H., Dalamangas, L., and Gilani, A. the protective effects of methionine and zinc on alcohol induced embryopathy in the chick. *Teratology* 1991 May;43(5):417-8
- Drug** Gilani, S. H(A), Dalamangas L(A), Gilani A(A), Seyoum, G., and Persaud, T. V. N. 1994. chick embryonic development following exposure to ethanol, methionine and zinc. *Research Communications in Substances of Abuse* 15(1-2): 67-70.
- Nut** Gilardi, James D., Duffey, Sean S., Munn, Charles A., and Tell, Lisa A. biochemical functions of geophagy in parrots: detoxification of dietary toxins and cytoprotective effects. *J. Chem. Ecol.* (1999) 25(4): 897-922 .
- Abstract** Gildersleeve, R. P. and Hebert, J. A. 1979. the effects of nutritional force-pausing on hen plasma progesterone levels. *Poultry Science* 58(4): 1060-1061.

- Unrel** Gill, G. N. 1995. the enigma of lim domains. *Structure* 3(12): 1285-9.
- Org Met** Gill, J. E. and Redfern, R. laboratory tests of 7 rodenticides for the control of meriones-shawi. *J HYG. Journal of Hygiene*. 91 (2). 1983. 351-358.
- No COC** Gill, J. E. and Redfern R. 1979. laboratory tests of seven rodenticides for the control of mastomys natalensis. *J.Hyg.* 83(2): 345-352.
- No COC** Gill, J. E. and Redfern R. 1983. laboratory tests of seven rodenticides for the control of meriones shawi. *J.Hyg.,Camb.* 91(2): 351-357.
- No COC** Gill, J. E. and Redfern R. 1980. laboratory trials of seven rodenticides for use against the cotton rat (sigmodon hispidus). *J.Hyg.* 85(3): 443-450.
- Surv** Gill, J. M. and Darby, J. T. 1993. deaths in yellow-eyed penguins (megadyptes antipodes) on the ottagopeninsula during the summer of 1990. *New Zealand Veterinary Journal*. 41(1): 39-42.
- Phys** Gill, Ravinder Kaur, Mahmood, Safrun, Nagpaul, Joginder Pal, and Mahmood, Akhtar. functional role of sialic acid in igg binding to microvillus membranes in neonatal rat intestine. *Biol. Neonate* (1999) 76(1): 55-64.
- No Dose** Gill, S. P. S., Singh, R., Singha, S. P. S., and Setia, M. S. age-related changes in the activity of erythrocytic carbonic anhydrase during early neonatal period in buffalo calves. *CURR SCI (BANGALORE). Current Science (Bangalore)*. 56 (12). 1987. 613-614.
- Unrel** Gimenez, A., Caballeria, J., Pares, A., Alie, S., Deulofeu, R., Andreu, H., and Rodes, J. 1992. influence of dietary zinc on hepatic collagen and prolyl hydroxylase activity in alcoholic rats. *Hepatology* 16(3): 815-9.
- No COC** Gimenez, America, Caballeria, Joan, Pares, Albert, Alie, Silvia, Deulofeu, Ramon, Andreau, Hernan, and Rodes, Joan. influence of dietary zinc on hepatic collagen and prolyl hydroxylase activity in alcoholic rats. *Hepatology (St. Louis)* (1992) 16(3): 815-19.
- Unrel** Giniger, E., Tietje, K., Jan, L. Y., and Jan, Y. N. 1994. lola encodes a putative transcription factor required for axon growth and guidance in drosophila. *Development* 120(6): 1385-98.
- No Oral** Ginovker, A. G. 1970. inclusion of zinc-65 as an indicator of the differentiation of prostatic epithelium. *Fiz.-Khim. Probl. Sovrem. Biol. Med. Mater. Konf.* 247-9.
- HHE** Ginsburg, H., Gorodetsky, R., and Krugliak, M. 1986. the status of zinc in malaria (plasmodium-falciparum) infected human red blood-cells - stage dependent accumulation, compartmentation and effect of dipicolinate. *Biochimica Et Biophysica Acta* 886(3): 337-344.
- Mineral** Ginter, Emil, Bobek, Pavel, Polacek, Ivan, Ginterova, Anastazia, and Kralova, Stefania. levels of mineral substances in the tissues of hamsters after long-term administration of apples or oyster mushrooms. *Biologia (Bratislava)* (1990) 45(6): 483-90.
- OAC** Ginzburg, M. B. 1969. content of zinc in rat testes after total lethal and chronic x-irradiations. *Radiobiologiya* 9(1): 98-100 .
- No Oral** Ginzburg, M. B. zinc level in the testicles of rats following exposure to whole body lethal and chronic irradiation by x-rays. *Radiobiologiya*. 9 (1). 1969 98-100.
- FL** Ginzburg, M. B. 1969. [zinc levels in the rat testis after general lethal and chronic x-ray irradiation]. <original> soderzhanie tsinka v semennikakh krysa pri obshchem letal'nom i

khronicheskoy obluchenii rentgenovymi luchami. *Radiobiologiya* 9(1): 98-100 .

- CP** GIOVENGO, S. L. and LARSON, A. A. 1997. role of zinc translocation in the development of kainic acid-induced persistent thermal hyperalgesia in the mouse. *27TH ANNUAL MEETING OF THE SOCIETY FOR NEUROSCIENCE*
- Herp** Gipouloux, J. D., Girard, C., and Gipouloux, S. 1986. number of somatic and germ-cells during early stages of gonadal development in frog larvae treated with zinc-sulfate. *Roux's Archives Of Developmental Biology* 195(3): 193-196.
- Mix** Gipp, W. F., Pond, W. G., Kallfelz, F. A., Tasker, J. B., Van, C. D. R., Krook, L., and Visek, W. J. 1974. effect of dietary copper iron and ascorbic-acid levels on hematology blood and tissue copper iron and zinc concentrations and copper-64 and iron-59 metabolism in young pigs. *Journal of Nutrition*. 104(5): 532-541.
- Abstract** Gipp, W. F. and Walker, E. F. Jr. 1970. response of young pigs to 3 dietary copper levels . *Journal of Animal Science*. 31(1): 201.
- FL** Girard, C. Agriculture Canada Lennoxville Canada Station de Recherches, Matte, J. J., Robert, S., Farmer, C., and Martineau, G. P. 1992. effects of high fiber regimens given to sows during gestation on serum concentrations of micronutrients. <original> evolution des concentrations seriques de nutriments mineurs chez des truies reproductrices soumises a des regimes a haute teneur en fibres. [24. pig research conference in france. 4, 5 and 6 february 1992, paris (france)]. <original> 24. journees de la recherche porcine en france. 4, 5 et 6 fevrier 1992, paris (france). *P. 195-200*
- Nut** Girard, C. L., Robert, S., Matte, J. J., Farmer, C., and Martineau, G. P. 1995. influence of high fibre diets given to gestating sows on serum concentrations of micronutrients. *Livestock Production Science* 43(1): 15-26.
- Bio Acc** Girard Christiane L(A), Robert Suzanne(A), Matte, J. Jacques(A), Farmer Chantal(A), and Martineau Guy-Pierre. 1996. serum concentrations of micronutrients, packed cell volume, and blood hemoglobin during the first two gestations and lactations of sows. *Canadian Journal of Veterinary Research* 60(3): 179-185.
- Nut** Giri, A. K., Bandyopadhyay, T. S., Mukherjee, A., Talukder, G., and Sharma, A. 1988. effects of vitamin c and vitamin a on post chromosomal aberration in vivo induced by metanil yellow and zinc chloride. *Cytologia : International Journal Of Cytology*. 53(4): 793-799.
- Biom** Giri, S. N(A), Grahmm, T. W., Daels, P. F., Bondurant, R. H., Cullor, J. S., and Osburn, B. I. 1997. mechanism and prevention of endotoxin-induced abortion and plasma zinc level as a biomarker for spontaneous abortion in cows and mares. *Journal of Veterinary Pharmacology and Therapeutics* 20(SUPPL. 1): 165-166.
- Mix** Giroux, E., Lachmann, P. J., Petering, H. G., Prakash, N. J., and Schechter, P. J. tissue- and metal-specific effects of thiolacrylic acids in rats. *Biol. Trace Elem. Res.* (1983) 5(2): 115-28 .
- Nut def** Giugliano, R. and Millward, D. J. the effects of severe zinc deficiency on protein turnover in muscle and thymus. *Br. J. Nutr.* (1987) 57(1): 139-55.
- Nut def** Giugliano, R. and Millward, D. J. growth and zinc homeostasis in the severely zinc-deficient rat. *Br. J. Nutr.* (1984) 52(3): 545-60.
- Nut def** Giugliano, R. and Millward, D. J. 1984. growth and zinc homeostasis in the severely zn-deficient

rat. *British Journal of Nutrition* 52(3): 545-60.

- Nut def** Giunta, J. L., Hutchinson, M., and Wallwork, J. C. 1988. parakeratosis of the labial mucosa in zinc-deficient rats. *Journal of Oral Pathology* 17(4): 186-90.
- Nut def** Giunta, John L., Hutchinson, M., and Wallwork, J. C. parakeratosis of the labial mucosa in zinc-deficient rats. *J. Oral Pathol. (1988)* 17(4): 186-90.
- Plant** Givens, D. I. and Hopkins, J. R. 1978. the availability of copper to grazing ruminants in parts of northyorkshire. *Journal of Agricultural Science, UK* 91(1): 13-16.
- Org Met** Glahn, J. F. and Lamper, L. D. hazards to geese from exposure to zinc phosphide rodenticide baits. *California Fish and Game.* 69 (2). 1983. 105-114.
- Gene** Glassman, A. B. 1995. cytogenetics, gene fusions, and cancer. *Annals of Clinical and Laboratory Science* 25(5): 389-93.
- In Vit** Glassman, A. B., Rydzewski, R. S., and Bennett, C. E. trace metal levels in commercially prepared tissue culture media. *Tissue & Cell.* 12 (4). 1980 (Recd. 1981). 613-618.
- Rev** Glattleider, D. L. 1993. digestive pathology of the growing pig and feeding. *Recueil De Medecine Veterinaire De L'Ecole D'Alfort* 169(8-9): 719-732.
- Abstract** Gleason, D. P. and Greene, L. W. 1996. growth and tissue zinc concentrations of rats fed zinc chloride or zinc methionine with increasing levels of copper. *Journal of Animal Science* 74(SUPPL. 1): 186.
- No COC** Glinka, E. Yu, Belyaeva, N. F., and Kagan, Z. S. complex kinetic behavior of fructose-1 6-bisphosphatase from rat and rabbit liver. *Biokhimiya.* 50 (11). 1985 (Recd. 1986). 1866-1871.
- Surv** Glooschenko, V., Blancher, P., Herskowitz, J., Fulthorpe, R., and Rang, S. 1986. association of wetland acidity with reproductive parameters and insect prey of the eastern kingbird tyrannus-tyrannus near sudbury, ontario. *Water Air Soil Pollut.* 30(3-4): 553-568.
- CP** Glore, S. R(A), Tripp, C. L(A), and Stoecker, B. J. 1995. cardiac muscle mineral status during a very-low-calorie diet. *FASEB Journal* 9(3): A451.
- Nut def** Glore, Stephen R., Orth, Victoria L., Knehans, Allen W., and Erdman, John W. Jr. efficacy of dietary zinc supplementation on catch-up growth after protein malnutrition. *J. Nutr. Biochem.* (1993) 4(5): 281-5.
- Nut** Glore, Stephen R., Orth, Victoria L., Stoecker, Barbara J., Knehans, Allen W., and Erdman, John W. Jr. dietary zinc supplements do not enhance catch-up growth of rats during recovery from protein-zinc malnutrition when the diets are based on either isolated soybean protein or casein. *Nutr. Res. (N. Y.)* (1993) 13(9): 1025-37.
- Phys** Glowinski J(A), Farbiszewski, R., Glowinski, S., and Chwiecko, M. 1997. activity and distribution of superoxide dismutase in the layers of polyester grafts. *European Surgical Research* 29(5): 368-374.
- Drug** Gluhovic, M., Vasic, J., Zivkovic, B., Fabijan, M., and Gluhovic, Z. 1995. zinc oxide in the prevention of diarrhoea in piglets. *Veterinarski Glasnik* 49(7/8): 485-488.
- Drug** Gluhovic Miodrag(A), Vasic Jelisaveta, Zivkovic Branislav, Fabijan Mihal, and Gluhovic Zora. 1995. zink oxide in prevention of diarrhea in piglets. *Veterinarski Glasnik* 49(7-8): 485-488.

- FL** Gluschenko, N. N., Ol'khovskaya, I. P., Pleteneva, T. V., Fatkullina, L. D., Ershov, Yu. A., and Fedorov, Yu. I. biological action of fine metal powders. *Izv. Akad. Nauk SSSR Ser. Biol.* (1989): (3), 415-21.
- In Vit** Gockerman Amy and Clemmons David R(A). 1995. porcine aortic smooth muscle cells secrete a serine protease for insulin-like growth factor binding protein-2. *Circulation Research* 76(4): 514-521.
- Gene** Godson Dale L(A), Baca-Estrada Maria E(A), Van Kessel Andrew G(A), Hughes Huw P A(A), Morsy Mohamad A(A), Van Donkersgoed Joyce(A), Harland Richard J(A), Shuster Dale E, Daley Michael J, and Babiuk Lorne A= (A). 1995. regulation of bovine acute phase responses by recombinant interleukin-1-beta. *Canadian Journal of Veterinary Research* 59(4): 249-255.
- Bio Acc** Goede, A. A. and M. DeBruin. 1986. the use of bird feathers for indicating heavy metal pollution. *Environ. Monit. Asses.*: pp. 249-256.
- Mix** Goel, A., Dhawan, D., and Kheruka, S. 1994. evaluation of zinc in the regulation of serum t3 and t4 levels and hepatic functions in carbontetrachloride-intoxicated rats. *Biol. Trace Elem. Res.* 41(1-2): 59-68.
- CP** Goel Rajiv(A), Puza Scott, Chowdhury Aditi, Mishra Om P, and Delivoria-Papadopoulos Maria. 1996. modification of the zn++ binding site of the nmda receptor during hypoxia in fetal guinea pig brains at term. *Pediatric Research* 39(4 PART 2): 73A.
- Acu** Goering, Peter L. and Klaassen, Curtis D. zinc-induced tolerance to cadmium hepatotoxicity. *Toxicol. Appl. Pharmacol.* (1984) 74(3): 299-307 .
- Nut** Goetsch, A. L., Murphy, G. E., Grant, E. W., Forster, L. A. Jr., Galloway, D. L. Sr., West, C. P., and Johnson, Z. B. 1991. effects of animal and supplement characteristics on average daily gain of grazing beef cattle. *Journal of Animal Science* 69(2): 433-442.
- CP** GOETZ, G. and FRIEDBERG, K. D. 1985. cadmium and zinc contents of various rat organs following the uptake of cadmium chloride with the drinking water. *JOINT MEETING OF THE BELGIAN*
- FL** Goetz, G. and Friedberg, K. D. 1987. *Chronische Wirkungen Niedriger, Umweltrelevanter Cadmiumdosen Auf Das Immunsystem Bei Ratten Und Maeusen. Tierexperimentelle Untersuchungen Zur Immunotoxikologischen Wirkung Von Cadmium. (Chronic Effects of Low Ecologically Relevant Doses of Cadmium on the Immunological System of Rats and Mice. Animal Experiments to Investigate the Immuno-Toxicological Effects of Cadmium).* UBA-FB-89-118
- Drug** Gogu, S. R. and Agrawal, K. C. 1996. the protective role of zinc and n-acetylcysteine in modulating zidovudine induced hematopoietic toxicity. *Life Sciences* 59(16): 1323-9.
- FL** Goia, F., Cappella, M., Bianciotto, M., and Gilardino, M. O. 1990. [diet constituents: analysis of their possible cariogenic and cariostatic effect]. <original> i costituenti della dieta: analisi del loro possibile effetto cariogeno e cariostatico. *Minerva Ortognatodontica* 8(3): 195-200.
- CP** Gokel, Eva M., Kirchgessner, M., and Roth, H. P. 1986. chromium deficiency in growing rats and its effects on blood glucose and serum insulin. *Spurenelem.-Symp. 5th : Issue Trace Elements*, 576-82. Editor(s): Anke, Manfred. Publisher: Friedrich-Schiller-Univ. Jena, Jena, Ger. Dem. Rep.
- FL** Gol'dberg, E. D., Eshchenko, V. A., and Bovt, V. D. 1992. [zinc content of pancreatic islets in diabetes]. <original> soderzhanie tsinka v pankreaticheskikh ostrovkakh pri diabete. *Arkhir*

- No Control** Golan, F. A. and Creger, C. R. 1979. the use of zinc oxide as a method of resting turkey breeder hens. *Feedstuffs, USA* 51(42): 32.
- Aquatic** Goldberg, E. D. 1972. *Baseline Studies of Pollutants in the Marine Environment and Research Recommendations*. NSF/IDOE-74-26
- Phys** Goldberg, E. D., Eshchenko, V. A., and Bovt, V. D. 1990. diabetogenic activity of chelators in some mammalian species. *Endocrinologie* 28(2): 51-5.
- Unrel** GOLDBERG, E. D., ESHICENKO, V. A., and BOVT, V. D. the diabetogenic and acidotropic effects of chelators. *EXP PATHOL (JENA)*; 42 (1). 1991. 59-64.
- Nut def** Goldberg, M., Carreau, J. P., Driessens, F. C. M., and Septier, D. zinc deficiency-induced changes in the lipid composition and ultrastructure of rat incisor teeth. *Arch. Oral Biol.* (1990) 35(4): 255-64 .
- Abstract** GOLDBLUM, S. E., COHEN, D. A., and MCCLAIN, C. J. 1985. effect of interleukin 1 escherichia-coli endotoxin and stress on serum zinc concentrations and neutrophil count in the rat. *43RD ANNUAL MEETING OF THE AMERICAN FEDERATION FOR CLINICAL RESEARCH (MIDWEST SECTION)*
- HHE** Golden, B. E. and Golden, M. H. N. plasma zinc rate of weight gain and the energy cost of tissue deposition in children recovering from severe mal nutrition on a cows milk or soy protein based diet. *AM J CLIN NUTR. American Journal of Clinical Nutrition.* 34 (5). 1981. 892-899.
- HHE** Golden, M. H. N. and Golden, Barbara E. 1985. problems with the recognition of human zinc-responsive conditions. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th* : Meeting Date 1984, 933-8, 942-3. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK..
- Alt** Golenser, J., Peled-Kamar, M., Schwartz, E., Friedman, I., Groner, Y., and Pollack, Y. 1998. transgenic mice with elevated level of cuznsod are highly susceptible to malaria infection. *Free Radical Biology & Medicine* 24(9): 1504-10.
- CP** Golenser J(A), Domb A(A), Tsafack A(A), Nisim O(A), Chevion M(A), Ponka, P., Eling, W., and Cabantchick I(A). 1997. slow release of novel iron chelators for the treatment of malaria. *Journal of Eukaryotic Microbiology* 44(1): 37A.
- FL** Golikov, A. V. and Mel'nikova, K. V. 1982. zinc sulphate for foot rot in sheep. *Veterinariya, Moscow, USSR* (No.9): 41-42.
- Prim** Golub, M. S. adolescence as a vulnerable period for disruption of cns development in monkeys. *Neurotoxicol Teratol* 1997 May/Jun;19(3):240
- Nut def** Golub, M. S. effect of combined iron and zinc deficiency during the adolescent growth spurt on cognitive performance of monkeys. *Neurotoxicol Teratol* 1998 May/Jun;20(3):368
- CP** Golub, M. S., Buck, L. A., Gershwin, M. E., and Keen, C. L. 1995. effect of zinc malnourishment on diurnal phase shift in adolescent rhesus monkeys. *Society for Neuroscience Abstracts* 21(1-3): 1236.
- Abstract** Golub, M. S., Gershwin, M. E., and Hurley, L. S. 1982. passive-avoidance deficit in mice deprived of zinc during post-embryonic brain-development. *Teratology* 25: A44.

- Prim** Golub, M. S., Gershwin, M. E., Hurley, L. S., Baly, D. L., and Hendrickx, A. G. 1984. studies of marginal zinc deprivation in rhesus monkeys. ii. pregnancy outcome. *American Journal Of Clinical Nutrition*. 39 (6): 879-887.
- Prim** Golub, M. S., Gershwin, M. E., Hurley, L. S., Cheung, A., and Hendrickx, A. G. 1985. effects of marginal dietary zinc deprivation on the development of rhesus-monkey infants. *Federation Proceedings* 44: 932.
- Prim** Golub, M. S., Gershwin, M. E., Hurley, L. S., and Hendrickx, A. G. 1988. studies of marginal zinc deprivation in rhesus monkeys. viii. effects in early adolescence. *American Journal of Clinical Nutrition* 47(6): 1046-51.
- Prim** Golub, M. S., Gershwin, M. E., Hurley, L. S., Hendrickx, A. G., and Saito, W. Y. 1985. studies of marginal zinc deprivation in rhesus monkeys: infant behavior. *American Journal of Clinical Nutrition* 42(6): 1229-39.
- Prim** Golub, M. S., Gershwin, M. E., Hurley, L. S., Hendrickx, A. G., and Saito, W. Y. studies of marginal zinc deprivation in rhesus monkeys macaca-mulatta infant behavior. *American Journal of Clinical Nutrition*. 42 (6). 1985. 1229-1239.
- Prim** Golub, M. S., Gershwin, M. E., Hurley, L. S., Saito, W. Y., and Hendrickx, A. G. 1984. studies of marginal zinc deprivation in rhesus monkeys. iv. growth of infants in the first year. *American Journal Of Clinical Nutrition*. 40(6): 1192-1202.
- Prim** Golub, M. S., Gershwin, M. E., Lonnerdal, B., Keen, C. L., Hurley, L. S., and Hendrickx, A. G. problems associated with long-term feeding of purified diets in rhesus monkeys. *Primates*. 31 (4). 1990. 579-588.
- Nut def** Golub, M. S., Gershwin, M. E., and Vijayan, V. K. 1983. passive avoidance performance of mice fed marginally or severely zinc deficient diets during post-embryonic brain development. *Physiology & Behavior* 30(3): 409-13.
- CP** Golub, M. S., Haynes, D. C., Gershwin, M. E., Hurley, L. S., and Hendrickx, A. G. fetal and maternal status at mid-gestation in marginally zinc deprived rhesus monkeys. *FIFTH JOINT MEETING OF THE AMERICAN INSTITUTE OF NUTRITION, THE AMERICAN SOCIETY FOR CLINICAL NUTRITION, AND THE CANADIAN SOCIETY FOR NUTRITIONAL SCIENCES, DAVIS, CALIF., USA, JULY 20-24, 1986. AM J CLIN NUTR*. 43 (6). 1986. No Pagination.
- Prim** GOLUB, M. S., HURLEY, L. S., and GERSHWIN, M. E. gestational zinc deficiency--reply.
- Nut def** Golub, M. S., Keen, C. L., Gershwin, M. E., and Hendrickx, A. G. 1995. developmental zinc deficiency and behavior. *Journal of Nutrition* 125(8 Suppl): 2263S-2271S.
- Nut def** Golub, M. S., Keen, C. L., Gershwin, M. E., and Vijayan, V. K. 1986. growth, development, and brain zinc levels in mice marginally or severely deprived of zinc during postembryonic brain development. *Nutrition and Behavior* 3(2): 169-180.
- Food** Golub, M. S., Keen, C. L., Hendrickx, A. G., and Gershwin, M. E. food preference of young rhesus monkeys fed marginally zinc deficient diets. *Primates*. 32 (1). 1991. 49-60.
- Prim** Golub, Mari S., Gershwin, M. Eric, Hurley, Lucille S., Baly, Deborah L., and Hendrickx, Andrew G. studies of marginal zinc deprivation in rhesus monkeys : ii. pregnancy outcome. *Am. J. Clin. Nutr.* (1984) 39(6): 879-87.
- Prim** Golub, Mari S., Gershwin, M. Eric, Hurley, Lucille S., Baly, Deborah L., and Hendrickx, Andrew

G. studies of marginal zinc deprivation in rhesus monkeys . i. influence on pregnant dams. *Am. J. Clin. Nutr.* (1984) 39(2): 265-80.

- Prim** Golub, Mari S., Gershwin, M. Eric, Hurley, Lucille S., and Hendrickx, Andrew G. studies of marginal zinc deprivation in rhesus monkeys . viii. effects in early adolescence. *Am. J. Clin. Nutr.* (1988) 47(6): 1046-51.
- Prim** Golub, Mari S., Gershwin, M. Eric, Hurley, Lucille S., Hendrickx, Andrew G., and Saito, Wilfred Y. studies of marginal zinc deprivation in rhesus monkeys : infant behavior. *Am. J. Clin. Nutr.* (1985) 42(6): 1229-39.
- Prim** Golub, Mari S., Gershwin, M. Eric, Hurley, Lucille S., Saito, Wilfred Y., and Hendrickx, Andrew G. studies of marginal zinc deprivation in rhesus monkeys . iv. growth of infants in the first year. *Am. J. Clin. Nutr.* (1984) 40(6): 1192-202.
- Nut def** Golub, Mari S., Gershwin, M. Eric, and Vijayan, Vijaya K. passive avoidance performance of mice fed marginally or severely zinc deficient diets during post-embryonic brain development. *Physiol. Behav.* (1983) 30(3): 409-13.
- No Dose** Golub, Mari S., Han, Bin, and Keen, Carl L. developmental patterns of aluminum and five essential mineral elements in the central nervous system of the fetal and infant guinea pig. *Biol. Trace Elem. Res.* (1996) 55(3): 241-251.
- Prim** Golub, Mari S., Keen, Carl L., and Gershwin, M. Eric. behavioral and hematologic consequences of marginal iron-zinc nutrition in adolescent monkeys and the effect of a powdered beef supplement. *Am. J. Clin. Nutr.* (1999) 70(6): 1059-1068.
- Prim** Golub, Mari S., Keen, Carl L., and Gershwin, M. Eric. 2000. moderate zinc-iron deprivation influences behavior but not growth in adolescent rhesus monkeys . *J. Nutr.* 130(2S): 354S-357S .
- Prim** Golub, Mari S., Keen, Carl L., Gershwin, M. Eric, Styne, Dennis M., Takeuchi, Peter T., Ontell, Francesca, Walter, Robert M., and Hendrickx, Andrew G. adolescent growth and maturation in zinc-deprived rhesus monkeys. *Am. J. Clin. Nutr.* (1996) 64(3): 274-282.
- Nut def** Golub, Mari S., Keen, Carl L., Gershwin, M. Eric, and Vijayan, Vijaya K. growth , development , and brain zinc levels in mice marginally or severely deprived of zinc during postembryonic brain development. *Nutr. Behav.* (1986) 3(2): 169-80.
- Nut def** Golub, Mari S., Keen, Carl L., Vijayan, Vijaya K., Gershwin, M. Eric, and Hurley, Lucille S. early development of brain and behavior in mice fed a marginally zinc deficient diet. *Neurol. Neurobiol.* (1984) 11B(Neurobiol. Zinc, Part B): 65-75.
- Prim** Golub, Mari S, Takeuchi, Peter T, Keen, Carl L, Gershwin, M Eric, Hendrick, Andrew G, and Lonnerdal, Bo. modulation of behavioral performance of prepubertal monkeys by moderate dietary zinc deprivation. *Am. J. Clin. Nutr.* (1994) 60(2): 238-43.
- Prim** Golub, Mari S., Takeuchi, Peter T., Keen, Carl L., Hendrickx, Andrew G., and Gershwin, M. Eric. activity and attention in zinc-deprived adolescent monkeys. *Am. J. Clin. Nutr.* (1996) 64(6): 908-915.
- Prim** Golub, Mari S., Tarantal, Alice F., Gershwin, M. Eric, Keen, Carl L., Hendrickx, Andrew G., and Lonnerdal, Bo. ultrasound evaluation of fetuses of zinc-deprived monkeys (macaca mulatta). *Am. J. Clin. Nutr.* (1992) 55(3): 734-40.

- FL** Golushko, V. M., Vinnik, L. N., and Fedosenko, O. 1987. rapeseed oilmeal in diets for pigs. *Svinovodstvo, Moscow* (5): 21-23.
- Nut def** Gombe, S., Apgar, J., and Hansel, W. effect of zinc deficiency and restricted food intake on plasma and pituitary lh and hypothalamic lrf [lh-releasing factor] in female rats. *Biol. Reprod.* (1973) 9(4): 415-19.
- Nut def** Gombe, S., Apgar, J., and Hansel, W. effect of zinc deficiency and restricted food intake on plasma and pituitary luteinizing hormone and hypothalamic luteinizing hormone releasing factor in female rats. *Biology of Reproduction.* 9 (4). 1973 415-419.
- Meth** Gomes, A., Alam, M. I., Auddy, B., and Dasgupta, S. C. isolation, purification and partial characterization of a hemolytic protein from bidder's organ of toad bufo melanostictus (schneider). *Indian J. Exp. Biol.* (1994) 32(2): 119-23.
- Nut def** Gomez-Ayala, A. E., Lisbona, F., Lopez-Aliaga, I., Pallares, I., Barrionuevo, M., Hartiti, S., Rodriguez-Matas, M. C., and Campos, M. S. the absorption of iron, calcium, phosphorus, magnesium, copper and zinc in the jejunum-ileum of control and iron-deficient rats. *Lab. Anim.* (1998) 32(1): 72-79.
- Alt** Gomez-Ayala, Adela E., Campos, Margarita S., Lopez-Aliaga, Immaculada, Pallares, Isabel, Hartiti, Sanae, Barrionuevo, Mercedes, Alferez, Maria J. M., Rodriguez-Matas, Maria C., and Lisbona, Francisco. effect of source of iron on duodenal absorption of iron, calcium, phosphorus, magnesium, copper and zinc in rats with ferropoenic anemia. *Int. J. Vitam. Nutr. Res.* (1997) 67(2): 106-114.
- FL** Gomez, S., Garcia, M. T., and Latorre, J. L. 1974. plasma zinc and malignant processes. *Revista Espanola De Fisiologia* 30(2): 97-101.
- FL** Gomez, S., Garcia, Maria T., and Latorre, J. L. dietary zinc and malignant processes. *Rev. Espan. Fisiol.* (1974) 30(2): 97-101.
- Nut def** Gomi, F. and Matsuo, M. 1995. effect of copper deficiency on the activity levels of ceruloplasmin and superoxide dismutase in tissues of young and old rats. *Aging* 7(1): 61-6.
- Unrel** Gomis-Rueth, Franz Xaver, Kress, Lawrence F., and Bode, Wolfram. first structure of a snake venom metalloproteinase: a prototype for matrix metalloproteinases/collagenases. *EMBO J.* (1993) 12(11): 4151-7.
- Nut def** Gomot, M. J., Faure, P., Roussel, A. M., Coudray C., Osman, M., and Favier, A. effect of acute zinc deficiency on insulin receptor binding in rat adipocytes. *Biological Trace Element Research.* Jan/Mar 1992. v. 32 p. 331-335.
- Unrel** Gonul, B., Soylemezoglu, T., Babul, A., and Celebi, N. effects of epidermal growth factor dosage forms on mice full-thickness skin wound zinc levels and relation to wound strength. *J. Pharm. Pharmacol.* (1998) 50(6): 641-644.
- No Oral** Gonul, B., Soylemezoglu, T., Yanicoglu, L., and Guvendik, G. effects of epidermal growth factor on serum zinc and plasma prostaglandin e2 levels of mice with pressure sores. *Prostaglandins* (1993) 45(2): 153-7.
- Alt** Gonul, Bilge, Guvendik, Gulin, Erbas, Deniz, and Yanicoglu, Lamia. the effect of epidermal growth factor on serum zinc levels of denervated mice. *Ankara Univ. Eczacilik Fak. Derg.* (1988) 18(1): 1-7 .

- No Oral** Gonul, Bilge, Soylemezoglu, Tulin, Guvendik, Gulin, and Erbas, Deniz. effects of egf on serum and tissue zinc and copper levels. *Ankara Univ. Eczacilik Fak. Derg.* (1995) 24(2): 75-81.
- In Vit** Gonzales, L. W. and Meizel, S. 1973. acid phosphatases of rabbit spermatozoa. i. electrophoretic characterization of the multiple forms of acid phosphatase in rabbit spermatozoa and other semen constituents. *Biochimica Et Biophysica Acta* 320(1): 166-79.
- FL** Gonzalez-M, F., Garcia-G, F., Mcniven, V., Valdes, G., and Emden, N. mineral supplement in starter complete diets of calves 1. effect on growth and nutrient digestibility. *Ciencia e Investigacion Agraria.* 11 (1). 1984. 9-18.
- Diss** Gonzalez M, Fernando. 1982. [addition of ca, p, fe, cu, zn and mg to the solid diet of pre-ruminant calves]. <original> adicion de ca, p, fe, cu, zn y mg en la dieta solida de terneros pre-rumiantes. 167 P.
- Bio Acc** Gonzalez, N., Geerken, C., Pedroso, R., and Lavandeira, L. E. 1984. mineral tissue composition in heifers (3/4 brown swiss-1/4 zebu). *Revista Cubana De Reproduccion Animal* 10(2): 35-48.
- FL** Gonzalez, N., Lavandeira, L. E., and Pedroso, R. incidence of mineral deficiencies in cuban cattle areas and use of open mineral mixes for their treatment. *Revista Cubana De Ciencias Veterinarias.* 19 (1). 1988. 73-80.
- Nut def** Gonzalez, N., Lavandeira, L. E., and Pedroso, R. 1988. incidence of mineral deficiencies in cuban cattle-farming areas and theuse of specially formulated mineral mixes for their treatment. *Revista Cubana De Ciencias Veterinarias* 19(1): 73-80.
- Surv** Gonzalez, N., Lavandeira, L. E., and Ruiz, T. 1992. disorders of metabolism in holstein cattle. 3. trace elements. *Revista Cubana De Reproduccion Animal* (Especial): 101-109.
- Unrel** Good, R. A. and Lorenz, E. 1992. nutrition and cellular immunity. *International Journal of Immunopharmacology* 14(3): 361-6.
- Nut def** Good, R. A., West, A., and Fernandes, G. 1980. nutritional modulation of immune responses. *Federation Proceedings* 39(13): 3098-104.
- CP** Goodall, S. R., Consulting, R. G., and Roe, W. lactation response to feeding zinc choline in two ohio dairy herds. *MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE AND AMERICAN DAIRY SCIENCE ASSOCIATION, MIDWESTERN SECTION, DES MOINES, IOWA, USA, MARCH 23-25, 1992. J ANIM SCI.* 70 (Suppl. 1). 1992. 92.
- Nut def** Goode, H. F., Purkins, L., Heatley, R. V., and Kelleher, J. the effect of dietary vitamin e deficiency on plasma zinc and copper concentrations. *Clin. Nutr.* (1991) 10(4): 233-5.
- No Dose** Goodman, B. L., Norton, R. A. Jr., and Diambra, O. H. 1986 . zinc oxide to induce molt in layers. *Poult. Sci.* 65(11): 2008-14 .
- Nut def** Gooneratne, S. R. and Christensen, D. A. 1997. effect of chelating agents on the excretion of copper, zinc and iron in the bile and urine of sheep. *Veterinary Journal* 153(2): 171-178.
- Alt** Gooneratne, S. R., Symonds, H. W., Bailey, J. V., and Christensen, D. A. 1994. effects of dietary copper, molybdenum and sulfur on biliary copper and zinc excretion in simmental and angus cattle. *Canadian Journal of Animal Science.* V. 74(2) P. 315-325
- Drug** Goossens, M. M., Nelson, R. W., Feldman, E. C., and Griffey, S. M. 1998. response to insulin treatment and survival in 104 cats with diabetes mellitus (1985-1995). *Journal of Veterinary*

Internal Medicine 12(1): 1-6.

- Bact** Goransson, L., Lange, S., and Lonnroth, I. Swedish Pig Centre PL2080 26890 Svalov Sweden. 1995. post weaning diarrhoea: focus on diet. *Pig News and Information*. 16(3): 89N-91N.
- Unrel** Gorbea, C. M., Marchand, P., Jiang, W., Copeland, N. G., Gilbert, D. J., Jenkins, N. A., and Bond, J. S. 1993. cloning, expression, and chromosomal localization of the mouse meprin beta subunit. *Journal of Biological Chemistry* 268(28): 21035-43.
- CP** Gordon, B. M., Hanson, A. L., Jones, K. W., Kwiatek, W. M., and Long, G. J. 1987. *Application of a Synchrotron Radiation Microprobe to Trace Element Analysis*. BNL-39905; CONF-8705124-2
- Diss** Gordon, Barry Lynn. 1976. the effects of zinc sulfate on olfactory discrimination and general health in male hooded rats. Avail.: Xerox Univ. Microfilms. Ann Arbor, Mich., Order No. 77-2323 From: Diss. Abstr. Int. B 1977, 37. 8. 4204. 121 pp.
- Abstract** Gordon, D. T. influence of chitin and chitosan on element utilization . 183RD ACS (AMERICAN CHEMICAL SOCIETY) NATIONAL MEETING, LAS VEGAS, NEV., USA, MARCH 28-APRIL 2, 1982. ABSTR PAP AM CHEM SOC. 183 (0). 1982. Agfd-50.
- Abstract** Gordon, D. T. interaction of iron and zinc on the bio availability of each element in the rat. 67TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, CHICAGO, ILL., USA, APRIL 10-15, 1983. FED PROC. 42 (5). 1983. Abstract 5224.
- Fate** Gordon, D. T., Zinn, K., Stoops, D., Trokey, D., Guzy, R., Peluso, M., Ratliff, V., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. the effect of increasing dietary fe on the retention of 59fe, 65zn and 67cu in the growing rat. 625-629.
- No COC** Gordon, E., Lasserre, A., Stull, P., Bajpai, P. K., and England, B. 1997. a zinc based self setting ceramic bone substitute for local delivery of testosterone. *Biomedical Sciences Instrumentation* 33: 131-6.
- CP** Gordon, E. F. behavioral correlates of experimental zinc deficiency. *The Neurobiology Of Zinc : Proceedings, Symposium, Society For Neuroscience, Boston, Massachusetts, November 4-6, 1983 / Editors, C.j. Frederickson, G.a. Howell, E.j. Kasarskis*. v. 11B p. 77-90. ill.
- Nut def** Gordon, E. F., Bond, J. T., Gordon, R. C., and Denny, M. R. 1982. zinc deficiency and behavior: a development perspective. *Physiology & Behavior* 28(5): 893-7.
- Nut def** Gordon, E. F., Denny, M. R., and Bond, J. T. 1980. behavioral and physiological effects of experimental zinc deficiency in young and aging rats. *Federation Proceedings* 39(3, 1): 431.
- Abstract** Gordon, E. F. and Wu, Y. U. pre natal ethanol exposure zinc iron magnesium and copper concentrations in amniotic fluid and post natal growth catch-up. 68TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 1-6, 1984 FED PROC. 43 (3). 1984. Abstract 649.
- Abstract** Gordon, E. F., Zemel, M. B., and Olson, K. L. effects of pre natal ethanol exposure on iron zinc copper and magnesium metabolism in rats. 67TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, CHICAGO, ILL., USA, APRIL 10-15, 1983. FED PROC. 42 (5). 1983. Abstract 5959.
- Nut def** Gordon, Elizabeth F., Bond, Jenny T., Gordon, Ralph C., and Denny, M. Ray. zinc deficiency and

behavior ; a developmental perspective . *Physiol. Behav.* (1982) 28(5): 893-7.

- No COC** Gordon, Elizabeth F. and Olson, Karen L. effects of prenatal ethanol exposure on metal metabolism, growth and sensorimotor development. *Neurol. Neurobiol.* (1984) 11B(Neurobiol. Zinc, Part B): 209-21.
- Diss** Gordon, Elizabeth Fabri. 1979. behavioral and physiological effects of zinc deficiency in young and aging male holtzman rats. Avail.: Univ. Microfilms Int. Order No. 8013739 From: Diss. Abstr. Int. B 1980, 40 . 12, Pt. 1. 5840 : 148 pp.
- Nut def** Gordon, P. R. and O'Dell, B. L. 1980. rat platelet aggregation impaired by short-term zinc deficiency. *Journal of Nutrition* 110(10): 2125-9.
- Nut def** Gordon, P. R. and O'Dell, B. L. short-term zinc deficiency and hemostasis in the rat. *Proc. Soc. Exp. Biol. Med.* (1980) 163(2): 240-4.
- Abstract** Gordon, P. R. and O'dell, B. L. short-term zinc deficiency impairs platelet function in the rat. 64TH ANNUAL MEETING OF THE FED. AM. SOC. EXP. BIOL., ANAHEIM, CALIF., USA, APR. 13-18, 1980. FED PROC. 39 (3). 1980. Abstract 385.
- Abstract** Gordon, P. R. and O'dell, B. L. zinc deficiency in guinea-pigs impaired platelet aggregation and other signs. 66TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, NEW ORLEANS, LA., USA, APRIL 15-23, 1982. FED PROC. 41 (3). 1982. Abstract 82.
- Nut def** Gordon, Phil R. and O'Dell, Boyd L. rat platelet aggregation impaired by short-term zinc deficiency. *J. Nutr.* (1980) 110(10): 2125-9.
- Nut def** Gordon, Philip R. and O'Dell, Boyd L. zinc deficiency and impaired platelet aggregation in guinea pigs. *J. Nutr.* (1983) 113(2): 239-45 .
- HHE** Gordon, Sheldon E., Almazan, Aurea M., Adeyeye, Samuel O., and Pace, Raphenia D. zinc bioavailability in young adult rats fed sweet potato greens containing phytic acid. *Life Support Biosphere Sci.* (1999) 6(2): 107-114.
- FL** Gorobets, A. I. 1991. retention of fat-soluble vitamins in broiler chickens and their productivity when given trace element chelates. *Sel'Skokhozyaistvennaya Biologiya* (6): 82-84.
- FL** Gorobets, A. I. and Batyuzhevskii, Yu. N. 1995. increasing the utilization of soyabean in poultry feeding. *Nauchno-Tekhnicheskii Byulleten', Ukrainskii Nauchno-Issledovatel'Skii Institut Ptitsevodstva* (34): 40-43 .
- FL** Gorodkov, V. G., Pashchenko, L. A., and Erzinkyan, K. L. changes in the angiotensin-converting enzyme activity in the lung tissue of rats under long-term action of apressin. *Biologicheskii Zhurnal Armenii.* 41 (3). 1988. 241-243.
- In Vit** Goshgarian, H. G. and Rafols, J. A. 1981. the phrenic nucleus of th albino rat: a correlative hrp and golgi study. *Journal of Comparative Neurology* 201(3): 441-56.
- Nut def** Gossrau, R., Gunther, T., Merker, H. J., and Graf, R. 1988. enhancement of maternal and fetal nephrotoxicity of salicylate by zinc-deficiency - morphological, enzyme histochemical and immunohistochemical studies. *Histochemistry* 89(1): 81-90.
- Bact** Goswami, R., Turk, B., Enderle, K., Howe, A., and Rundell, K. effect of zinc ions on the biochemical behavior of simian virus 40 small-t antigen expressed in bacteria. *J VIROL.*

- Fate** Goto, Tae, Kimura, Shuichi, Chiga, Machiko, Ishizuka, Yoko, Suwa, Junichi, and Kimura, Fumi. distribution and change in content of radioactive zinc in tissues of rats given diet containing radioactive zinc. *Miyagi Gakuin Joshi Daigaku Seikatsu Kagaku Kenkyusho Kenkyu Hokoku* (1977) : 11, 1-7.
- Mix** Goto, Tae, Kimura, Shuichi, Kisu, Yasuko, and Chiga, Machiko. daily intake of zinc and nutritional state of rats given a zinc-added diet . part iii. nutritional state of rats given a diet with added zinc and iron, and content of zinc, iron, calcium, and proteins in their tissues. *Miyagi Gakuin Joshi Daigaku Seikatsu Kagaku Kenkyusho Kenkyu Hokoku* (1976) : 10, 19-26 .
- Nut def** Goto, Tomoko, Komai, Michio, Suzuki, Hitoshi, and Furukawa, Yuji. behavioral and physiological study of the abnormality of salt taste sensation in zinc-deficient rats. *Nippon Aji to Nioi Gakkaishi* (1996) 3(3): 608-611.
- Nut def** Gottschall-Pass, Katherine T., Grahn, Bruce H., Gorecki, Dennis K. J., Semple, Hugh A., and Paterson, Phyllis G. depression of the electroretinogram in rats deficient in zinc and taurine during prenatal and postnatal life. *J. Nutr. Biochem.* (1998) 9(11): 621-628.
- Meth** Gottschall-Pass, Katherine T., rahn, Bruce H., Gorecki, Dennis K. J., and Paterson, Physllis G. oscillatory potentials and light microscopic changes demonstrate an interaction between zinc and taurine in the developing rat retina. *J. Nutr.* (1997) 127(6): 1206-1213.
- No Oral** GOYER, R. A., MILLER, C. R., ZHU, S. Y., and VICTERY, W. non-metallothionein-bound cadmium in the pathogenesis of cadmium nephrotoxicity in the rat. *TOXICOL APPL PHARMACOL*; 101 (2). 1989. 232-244.
- Surv** Grace, N. D. 1972. observations on plasma zinc levels in sheep grazing new zealand pastures. *New Zealand Journal of Agriculture* 15(No.2): 284-288.
- Abstract** Grace, N. D. and Watkinson, J. H. selenium zinc copper and iron metabolism of the young lamb. 48TH CONFERENCE OF THE NEW ZEALAND SOCIETY OF ANIMAL PRODUCTION, CANTERBURY, NEW ZEALAND, FEBRUARY 9-12, 1988. *PROC N Z SOC ANIM PROD.* 48 (0). 1988. 257-260.
- Surv** Grace, N. D(A), Pearce, S. G., Firth, E. C., and Fennessy, P. F. 1999. concentrations of macro- and micro-elements in the milk of pasture-fed thoroughbred mares. *Australian Veterinary Journal* 77(3): 177-180.
- Alt** Graham, Ellis R. and Telle, Paul. 1967. zinc retention in rabbits . effect of previous diet. *Science (Washington D.C.)*. 155(3763): 691-2.
- Plant** Graham, R. D., Welch, R. M., Grunes, D. L., Cary, E. E., and Norvell, W. A. 1987. effect of zinc-deficiency on the accumulation of boron and other mineral nutrients in barley. *Soil Science Society Of America Journal* 51(3): 652-657.
- Abstract** GRAHAM, T. W., CLEGG, M. S., LONNERDAL, B., THURMOND, M. C., and KEEN, C. L. 1986. isolation and characterization of metallothioneins in calves ingesting zinc toxic diets. 70TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY
- No Control** Graham, T. W., Feldman, B. F., Farver, T. B., Labavitch, F., O'Neil, S. L., Thurmond, M. C., Keen, C. L., and Holmberg, C. A. 1991. zinc toxicosis of holstein veal calves and its relationship tohaematological change and an associated thrombotic state. *Comparative Haematology*

International 1(3): 121-128.

- Nut def** Graham, T. W., Goodger, W. J., Christiansen, V., and Thurmond, M. C. 1987. economic losses from an episode of zinc toxicosis on a california vealcalf operation using a zinc sulfate-supplemented milk replacer. *Journal of the American Veterinary Medical Association* 190(6): 668-671.
- Bio Acc** Graham, T. W., Holmberg, C. A., Keen, C. L., Thurmond, M. C., and Clegg, M. S. 1988. a pathologic and toxicologic evaluation of veal calves fed large amounts of zinc. *Veterinary Pathology* 25(6): 484-491.
- No Dose** Graham, T. W., Thurmond, M. C., Clegg, M. S., Keen, C. L., Holmberg, C. A., Slanker, M. R., and Goodger, W. J. 1987. an epidemiologic study of mortality in veal calves subsequent to an episode of zinc toxicosis on a california veal calf operation using zinc sulfate-supplemented milk replacer. *Journal of the American Veterinary Medical Association* 190(10): 1296-1301.
- Abstract** Graham, T. W., Thurmond, M. C., and Keen, C. L. 1994. serum copper and zinc concentrations predict culling in pregnant holstein dairy cows. *Journal of Dairy Science* 77(SUPPL. 1): 345.
- CP** Graham, T. W., Thurmond, M. C., Mohr, F. C., Holmberg, C. A., and Keen, C. L. zinc supplement status and plasma metallothionein mt zinc and copper for predicting measures of health in typically fed dairy cows. *MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY (FASEB) PART II, ANAHEIM, CALIFORNIA, USA, APRIL 5-9, 1992. FASEB (FED AM SOC EXP BIOL) J.* 6 (5). 1992. A1680.
- Mineral** Graham, T. W(A), Thurmond, M. C(A), Gershwin, M. E., Picanso, J. P(A), Garvey, J. S, and Keen, C. L. 1994. serum zinc and copper concentrations in relation to spontaneous abortion in cows: implications for human fetal loss. *Journal of Reproduction and Fertility* 102(1): 253-262.
- FL** Grakova, N. A. and Ryazantsev, V. V. 1978. the effect of a zinc sulphate supplement on the physiological state of mink. *Sbornik Nauchno-Tekh. Inform. Vses. Nauchno-Issled. Inst. Okhot. Khozyaistva i Zverovodstva* (60): 45-51.
- CP** Gralak, M., Sieranska, B., Krasicka, B., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. the effect of sulphur supplement on zinc, copper and magnesium status in growing lambs. <document title>trace elements in man and animals - tema 8: proceedings of the eighth international symposium on trace elements in man and animals. 660-661.
- Bact** Grandi, C., Vita, C., Dalzoppo, D., and Fontana, A. 1980. thermolysin and bacillus subtilis neutral protease. conformation and stability of two homologous neutral metalloendopeptidases. *International Journal of Peptide and Protein Research* 16(4): 327-38.
- FL** Grandjean, D., Mateo, R., Lefol, J. F., and Wolter, R. 1983. nutritional, physiological, biochemical and haematological controls in the racing greyhound. *Recueil De Medecine Veterinaire* 159(9): 735-746.
- Phys** Grant, D. A. and Hermon-Taylor, J. 1979. hydrolysis of artificial substrates by enterokinase and trypsin and the development of a sensitive specific assay for enterokinase in serum. *Biochimica Et Biophysica Acta* 567(1): 207-15.
- CP** Grasbon T(A), Grasbon-Frodl, E. M., Juliusson B(A), Epstein, C., Brundin, P., Kampik, A., and Ehinger B(A). 1996. cu/zn superoxide dismutase transgenic retinal transplants. *Investigative Ophthalmology & Visual Science* 37(3): S95.

Drug	Grases, F., Garcia-Gonzalez, R., Genestar, C., Torres, J. J., and March, J. G. 1998. vitamin a and urolithiasis. <i>Clinica Chimica Acta; International Journal of Clinical Chemistry</i> ; 269
Mix	Grases, F., Garcia-Gonzalez, R., Torres, J. J., and Llobera, A. effects of phytic acid on renal stone formation in rats. <i>Scand. J. Urol. Nephrol.</i> (1998) 32(4): 261-265.
Drug	Graubert, M. D., Goldstein, S., and Phillips, L. S. nutrition and somatomedin xxvii. total and free igf-i and igf binding proteins in rats with streptozocin-induced diabetes. <i>Diabetes.</i> 40 (8). 1991. 959-965.
Alt	Gravielle, Maria C., De Novara, Alba Mitridate, and De Plazas, Sara Fiszer. modulatory action of zinc on gabaa receptor complex during avian cns development. <i>J. Neurosci. Res.</i> (1999) 57(4): 536-540.
No Oral	Grawe Kierstin Petersson(A) and Oskarsson Agneta. 2000. cadmium in milk and mammary gland in rats and mice. <i>Archives of Toxicology</i> 73(10-11): 519-527.
Org Met	Gray, T. J. B. Butterworth K. R. Gaunt I. F. Grasso P. and Gangolli S. D. 1978. short-term toxicity study of zinc dibutylidithiocarbamate in rats. <i>Food Cosmet.Toxicol.</i> 16: 237-242.
Food	GRAY, T. JB, BUTTERWORTH, K. R., GAUNT, I. F., GRASSO, P., and GANGOLLI, S. D. short-term toxicity study of zinc dibutylidithiocarbamate in rats. <i>FOOD COSMET TOXICOL</i> ; 16 (3). 1978 237-242
Diss	Greeley, J. Sharon. 1979. marginal zinc nutriture in the pregnant rat : effects on certain aspects of metabolism. <i>Avail.: Univ. Microfilms Int. Order No. 7928701 From: Diss. Abstr. Int. B</i> 1980, 40. 9. 4222. 181 pp.
Abstract	Greeley, S. and Fosmire, G. J. maternal nitrogen and zinc excretion in response to suboptimal zinc intake during gestation in the rat. <i>FED PROC. Federation Proceedings.</i> 36 (3). 1977 1079
Nut def	Greeley, S., Fosmire, G. J., and Sandstead, H. H. 1980. nitrogen retention during late gestation in the rat in response to marginal zinc intake. <i>American Journal of Physiology</i> 239(2): E113-8.
Nut def	Greeley, S. and Gniecko, K. 1986. short-term taste behavior and copper/vitamin b-6 nutriture in long-evans rats. <i>Physiology & Behavior</i> 38(6): 765-71.
No COC	Greeley, S., Johnson, W. T., Schafer, D., and Johnson, P. E. 1990. gestational alcoholism and fetal zinc accretion in long-evans rats. <i>Journal Of The American College Of Nutrition.</i> 9(3): 265-271.
Nut def	Greeley, S. and Sandstead, H. H. oxidation of alanine and beta hydroxy butyrate in late gestation by zinc restricted rats. <i>Journal of Nutrition.</i> 113 (9). 1983. 1803-1810.
Abstract	GREELEY, S., SCHAFER, D., and JOHNSON, P. E. 1988-1989. gestational alcoholism and zinc distribution in maternal rat tissues and fetuses. <i>72ND ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY</i>
Nut def	Greeley, S. J. 1984. zinc repletion during late gestation following chronic suboptimal zinc intake. <i>Nutrition Reports International.</i> 30(2): 389-395.
Nut def	Greeley, S. JONUA and Sandstead, H. H. 1983. oxidation of alanine and beta-hydroxybutyrate in late gestation by zinc-restricted rats (suboptimal zinc nutriture). <i>The Journal Of Nutrition.</i> 113 (9): 1803-1810.

- Nut def** Greeley, Sharon, Fosmire, Gary J., and Sandstead, Harold H. nitrogen retention during late gestation in the rat in response to marginal zinc intake. *Am. J. Physiol.* (1980) 239(2): E113-E118.
- Nut def** Greeley, Sharon and Sandstead, Harold H. oxidation of alanine and .beta.-hydroxybutyrate in late gestation by zinc-restricted rats. *J. Nutr.* (1983) 113(9): 1803-10.
- Nut def** Greeley, Sharon J. zinc repletion during late gestation following chronic suboptimal zinc intake. *Nutr. Rep. Int.* (1984) 30(2): 389-95.
- CP** Greeley, Sharon J. and Gniecko, Kathleen. 1985. zinc status and sucrose consumption in estrous female rats. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th* : Meeting Date 1984, 217-19. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK..
- Unrel** Green, R. W. and Mckay, R. H. the behavior of horse liver alcohol dehydrogenase in guanidine hydro chloride solutions. *Journal of Biological Chemistry.* 244 (18). 1969 5034-5043.
- No Oral** Green, Saul and Dobrjansky, Areta. corynebacterium parvum: effects on the biochemistry of mouse serum and liver. *J. Natl. Cancer Inst.* (1979) 63(2): 497-502.
- Prim** Greenberg, H. L., Avol, E. L., Bailey, R. M., and Bell, K. A. 1977. *Effects of Sulfate Aerosols Upon Cardiopulmonary Function in Squirrel Monkeys (Final Report). (Second Year Final Report: Effects of Nitrate and /or Sulfate Aerosols Upon Cardiopulmonary Function).* CRC-APRAC-CAPM-20-74
- No Dose** Greenberg, L. G. and Mahone, J. P. 1981. the effect of a 15-h photoperiod on reproductive function in boars at 2, 3, 4 or 5 months of age. *Canadian Journal of Animal Science* 61(4): 925-934.
- Surv** Greene, H. J. and Bakheit, H. A. 1984. a study of the aetiology, epidemiology and control of calf diarrhoea in ireland. *Irish Veterinary Journal* 38(4): 63-67.
- Rev** Greene, L. A. and Shooter, E. M. 1980. the nerve growth factor: biochemistry, synthesis, and mechanism of action. *Annual Review of Neuroscience* 3: 353-402.
- Mineral** Greene, L. W., Kasari, T. R., and Herd, D. B. 1995. organic sources of mineral for ruminants. *Veterinary Clinical Nutrition* 2(1): 22-27.
- Food** Greene, L. W., Lunt, D. K., and Byers, F. M. 1989. performance and carcass quality of steers supplemented with zinc oxideor zinc methionine. <document title>beef cattle research in texas, 1988. 264-269.
- Food** Greene, L. W., Lunt, D. K., Byers, F. M., Chirase, N. K., Richmond, C. E., Knutson, R. E., and Schelling, G. T. 1988. performance and carcass quality of steers supplemented with zinc oxideor zinc methionine. *Journal of Animal Science* 66(7): 1818-1823.
- Drug** Greene, L. W., May, B. J., Schelling, G. T., and Byers, F. M. 1989. site and level of apparent magnesium, calcium and zinc absorption insteers fed rumensin(r). <document title>beef cattle research in texas, 1988. 273-278.
- No COC** Greenman, David L., Morrissey, Robert L., Blakemore, William, Crowell, James, Siitonen, Paul, Felton, Paul, Allen, Richard, and Cronin, Gerald. subchronic toxicity of triethylenetetramine dihydrochloride in b6c3f1 mice and f344 rats. *Fundam. Appl. Toxicol.* (1996) 29(2): 185-93.

- Nut** Greger, J. L. 1989. effect of dietary-protein and minerals on calcium and zinc utilization. *Critical Reviews In Food Science And Nutrition* 28(3): 249-271.
- No COC** Greger, J. L. and Emery, S. M. 1987. mineral metabolism and bone strength of rats fed coffee and decaffeinated coffee. *Journal of Agricultural and Food Chemistry* 35(4): 551-556.
- Nut** Greger, J. L., Graham, K. L., Lee, K., and Chinn, B. L. 1985. bioavailability of zinc and copper to rats fed erythorbate and or nitrite-cured meats. *Journal Of Food Protection* 48(4): 355&.
- No COC** Greger, J. L., Gutkowski, C. M., and Khazen, R. R. 1989. interactions of lactose with calcium, magnesium and zinc in rats. *The Journal Of Nutrition.* 119(11): 1691-1697.
- Mix** Greger, J. L., Gutkowski, Christine M., and Khazen, Reem R. interactions of lactose with calcium, magnesium and zinc in rats. *J. Nutr. (1989)* 119(11): 1691-7 .
- No COC** Greger, J. L. and Johnson, M. A. effect of dietary tin on zinc, copper, and iron utilization by rats. *Food Cosmet. Toxicol. (1981)* 19(2): 163-6 .
- Nut def** Greger, J. L. and Krashoc, C. L. 1988. effects of a variety of calcium sources on mineral metabolism in anemic rats. *Drug-Nutrient Interactions* 5(4): 387-94 .
- Nut def** Greger, J. L. and Krashoc, Connie L. 1988. effects of a variety of calcium sources on mineral metabolism in anemic rats. *Drug-Nutr. Interact.* 5(4): 387-94 .
- Nut** Greger, J. L., Krzykowski, C. E., Khazen, R. R., and Krashoc, C. L. 1987. mineral utilization by rats fed various commercially available calcium supplements or milk. *Journal of Nutrition* 117(4): 717-24.
- No COC** Greger, J. L., Krzykowski, Catherine E., Khazen, Reem R., and Krashoc, Connie L. mineral utilization by rats fed various commercially available calcium supplements or milk. *J. Nutr. (1987)* 117(4): 717-24 .
- No COC** Greger, J. L. and Lyle, B. J. iron, copper and zinc metabolism of rats fed various levels and types of tea. *J. Nutr. (1988)* 118(1): 52-60 .
- Mix** Greger, J. L. and Mulvaney, Jude. absorption and tissue distribution of zinc, iron and copper by rats fed diets containing lactalbumin, soy and supplemental sulfur-containing amino acids. *J. Nutr. (1985)* 115(2): 200-10 .
- CP** Greger, J. L., Storey, M. L., Stahl, J. L., Cook, M. E., Gentry-Roberts, S. E., and Lynds, J. C. zinc, iron and copper interactions in humans, rats and chicks. *Trace Elements In Man And Animals 6 / Edited By Lucille S. Hurley, ... [Et Al.]*. p. 231-232.
- CP** Greger, J. L(A) and Tseng Emily. 1993. longitudinal changes during the development of hypertension in rats fed excess chloride and sodium. *Proceedings of the Society for Experimental Biology and Medicine* 203(3): 377-385.
- Unrel** Gregory, J. B., Gresser, J. D., and Wise, D. L. 1978. *Development of a Synthetic Polymer Burn Covering*. <NOTE> Final Rept. 1 Feb 73-30 Dec 77. DYNATECH-1704
- Food** Gregson, K., Boormand, K. N., and Frost, P. A. 1993. a computer advice system for a vegetarian diet. *British Food Journal.* 95(6): 31-34.
- FL** Grela, E. R., Czech, A., Winiarska, A., and Fiolka, M. 1998. effects of dietary supplementation of grass pea (*lathyrus sativus* l.) seeds on performance and some blood parameters in guinea pigs

(caviaporcella). *Annales Universitatis Mariae Curie-Sklodowska. Sectio EE Zootechnica* 16: 329-334.

- FL** Greve, T. and Brummerstedt, E. 1986. egg transplantation from two heifers with lethal trait a 46 during oral supplementation with zinc oxide. <original> aegtransplantation fra kvier med letalfaktor a 46 under peroral tilfoersel af zinkoxid. *Aarsberetning. Kongelige Veterinaer- Og Landbohoejskole. Institut for Sterilitetsforskning. (No.29) P. 51-58*
- Nut def** Grey, P. C. and Dreosti, I. E. deoxyribonucleic acid and protein metabolism in zinc-deficient rats. *J. Comp. Pathol. (1972)* 82(2): 223-8.
- Alt** Grider, A. 1986 . the effects of metallothionein on zinc metabolism in lethal-milk mutant mice. 150pp.
- Nut def** Grider, A. 1985. zinc-deficiency in lethal-milk (lm) mice - role of metallothionein (mt). *Ohio Journal Of Science* 85: 63.
- Abstract** Grider, A. Jr. zinc deficiency in lethal-milk lm mice role of metallothionein. *94TH ANNUAL MEETING OF THE OHIO ACADEMY OF SCIENCE ON THE LEGACY OF DANIEL DRAKE, M.D. (1785-1852), CINCINNATI, OHIO, USA, APR. 19-21, 1985. OHIO J SCI. 85 (2). 1985. 63.*
- Nut def** Grider, A. Jr. and Erway, L. C. 1986. intestinal metallothionein in lethal-milk mice with systemic zinc deficiency. *Biochemical Genetics.* 24(7/8): 635-642.
- Nut def** Grider, Arthur, Bailey, Lynn B., and Cousins, Robert J. 1990. erythrocyte metallothionein as an index of zinc status in humans. *Proc. Natl. Acad. Sci. U. S. A. (1990)* 87(4): 1259-62 .
- Diss** Grider, Arthur Jr. 1986. the effects of metallothionein on zinc metabolism in lethal -milk mutant mice. *Avail.: Univ. Microfilms Int. Order No. DA8622283 From: Diss. Abstr. Int. B 1986, 47. 6. 2329-30 : 150 pp.*
- Nut def** Grider, Arthur Jr. and Erway, Lawrence C. intestinal metallothionein in lethal -milk mice with systemic zinc deficiency. *Biochem. Genet. (1986)* 24(7-8): 635-42.
- No COC** Griffin, R. M. 1979. the response of cage-reared broiler cockerels to dietary supplements of nitrovin, zinc bacitracin or penicillin used singly or in paired combinations. *British Poultry Science* 20(3): 281-287.
- Org Met** Griffin, R. M. 1980. the response of cage-reared cockerels to dietary medication with growth promoters. i. size and consistency of the response. *Poultry Science* 59(2): 412-6.
- Nut def** Griffith, P. R. and Alexander, J. C. effect of zinc deficiency on amino acid metabolism of the rat. *Nutr. Rep. Int. (1972)* 6(1): 9-20.
- In Vit** Griffith, W. H. and Murchison, D. A. 1995. enhancement of gaba-activated membrane currents in aged fischer 344 rat basal forebrain neurons [published erratum appears in j neurosci 1995 jul;15(7 pt 1):following table of contents]. *Journal of Neuroscience* 15(3 Pt 2): 2407-16.
- Phys** Grigson Patricia S(A), Shimura Tsuyoshi, and Norgren Ralph. 1997. brainstem lesions and gustatory function: ii. the role of the nucleus of the solitary tract in na+ appetite, conditioned taste aversion, and conditioned odor aversion in rats. *Behavioral Neuroscience* 111(1): 169-179.
- Phys** Grigson Patricia S(A), Shimura Tsuyoshi, and Norgren Ralph. 1997. brainstem lesions and gustatory function: iii. the role of the nucleus of the solitary tract and the parabrachial nucleus in retention of a conditioned taste aversion in rats. *Behavioral Neuroscience* 111(1): 180-187.

- In Vit** Grimes, H. L., Chan, T. O., Zweidler-McKay, P. A., Tong, B., and Tschlis, P. N. 1996. the gfi-1 proto-oncoprotein contains a novel transcriptional repressor domain, snag, and inhibits g1 arrest induced by interleukin-2 withdrawal. *Molecular and Cellular Biology* 16(11): 6263-72.
- No Control** Grimmett, RER, McIntosh, IG, Wall, EM, and Hopkirk, CSM. 1937. chronic zinc- poisoning of pigs; results of experimental feeding of pure zinc lactate. *N. Z. J. Agric.* 54: 216.
- Drug** Grimshaw, W. T. R., Colman, P. J., and Petrie, L. 1987. efficacy of sulbactam-ampicillin in the treatment of neonatal calfdiarrhoea. *Veterinary Record* 121(8): 162-166.
- Nut** Grings, E. E., Hall, J. B., Bellows, R. A., Short, R. E., Bellows, S. E., and Staigmiller, R. B. 1998. effect of nutritional management, trace mineral supplementation, and norgestomet implant on attainment of puberty in beef heifers. *Journal of Animal Science* 76(8): 2177-2181.
- Nut** Grinstead, G. S., Tokach, M. D., Dritz, S. S., Goodband, R. D., and Nelssen, J. L. 2000. effects of spirulina platensis on growth performance of weanling pigs. *Animal Feed Science and Technology* 83(3/4): 237-247.
- Org Met** Gritz, B. G. de. 1995. copper-zinc superoxide dismutase (cuznsod) in antioxidant deficient pigs. *Journal of Veterinary Medicine. Series A* 42(9): 561-573.
- Unrel** Grizzard, T. J., Waterman, R. N., Randall, C. W., Hoehn, R. C., and Jenkins, S. H. ed. 1981. the stimulation of autotrophic production by urban stormwater-borne nutrients. water pollution research, part 3. *Water Sci. Technol.* vol. 13(no. 2): pp. 883-896.
- Phys** Grondin, B., Cote, F., Bazinet, M., Vincent, M., and Aubry, M. 1997. direct interaction of the krab/cys2-his2 zinc finger protein znf74 with a hyperphosphorylated form of the rna polymerase ii largest subunit. *Journal of Biological Chemistry* 272(44): 27877-85.
- CP** Groner, Y., Bar-Peled, O., Peled, M., and Lotem, J. 1997. tg-cuznsod mice display thymic abnormalities and enhanced apoptosis of thymocytes and cultured neurons. *Cytogenetics and Cell Genetics* 79(1-2): 48.
- FL** Gropp, J., Tiew, J., and Schulz, V. studies on the effect of unidentified growth factor containing product on growth and fodder utilization of chickens. *Z TIERPHYSIOL TIERERNAEHR FUTTERMITTELKD. Zeitschrift Fuer Tierphysiologie Tierernaehrung Und Futtermittelkunde.* 28 (2). 1971 102-112.
- FL** Groppel, B. Leipzig Univ. Jena Germany Agrarwissenschaftliche Fakultaet. Wissenschaftsbereich Tierernaehrungschemie and Anke, M. 1991. the effects of a sulphur, cadmium and molybdenum contamination in swine. <original> die auswirkungen einer schwefel-, cadmium- und molybdaenbelastung beim schwein. environmental aspects of animal production. <original> umweltaspekte der tierproduktion. *P.* 463-468. No. 33
- Mix** Grosicki, A., Kowalski, B., and Domanska, K. 1998. distribution of subtoxic doses of mercury in rats fed a diet enriched with cobalt, manganese, zinc and copper. *Mengen- Spurenelem. Arbeitstag., 18th* : 366-369. Editor(s): Anke, Manfred. Publisher: Verlag Harald Schubert, Leipzig, Germany..
- Mix** Grosicki, A., Kowalski, B., and Rachubik, J. 1997. interaction of dietary zinc with mercury absorption and distribution. *Mengen- Spurenelem. Arbeitstag., 17th* : 419-422. Editor(s): Anke, Manfred. Publisher: Verlag Harald Schubert, Leipzig, Germany..
- FL** Groth, W. 1976. histopathological findings in zinc deficiency and after subsequent repletion. *Zentralblatt Fur Veterinarmedizin, A* 23(1): 31-53.

Drug	Groundwater, W. and Macleod, I. B. 1970. the effects of systemic zinc supplements on the strength of healing incised wounds in normal rats. <i>British Journal of Surgery</i> 57(3): 222-5.
Unrel	Groutides, C. P. and Michell, A. R. 1990. changes in plasma composition in calves surviving or dying from diarrhoea. <i>British Veterinary Journal</i> 146(3): 205-210.
Gene	Groves, A. K., George, K. M., Tissier-Seta, J. P., Engel, J. D., Brunet, J. F., and Anderson, D. J. 1995. differential regulation of transcription factor gene expression and phenotypic markers in developing sympathetic neurons. <i>Development</i> 121(3): 887-901.
FL	Grozhevskaya, S. B., Pen'kov, V. M., Plyusnin, V. P., Bessonov, A. I., and Vikharev, V. Ya. 1986. effect of iodine, cobalt, zinc and sodium selenite on pregnant sows. <document title>puti povysheniya produktivnosti svinei i ovets. 58-68.
Mix	Gruden, N. and Momcilovic, B. zinc-65 transport in the duodenum and jejunum of rats fed milk enriched with iron. <i>Nutrition Reports International</i> . 19 (4). 1979. 483-490.
Fate	Gruden, Nevenka and Momcilovic, Berislav. 65zn transport in the duodenum and jejunum of rats fed milk enriched with iron. <i>Nutrition Reports International</i> Apr 1979. v. 19 (4) p. 483-489. charts.
CP	GRUND, P. and RAAB, W. H-M. 1989. histocompatibility of filling materials using laser doppler flowmetry. <i>FOURTH CONGRESS OF THE EUROPEAN SOCIETY OF ENDODONTOLOGY</i>
FL	Grungreiff, K., Abicht, K., Kluge, M., Presser, H. J., Franke, D., Kleine, F. D., Klauck, S., and Diete, U. 1988. clinical-studies on zinc in chronic liver-diseases. <i>Zeitschrift Fur Gastroenterologie</i> 26(8): 409-415.
FL	Gruzdev, N. V. 1975. the effect of level of zinc in the diet on semen production of bulls. <i>Zhivotnovodstvo</i> (6): 55-56.
Phys	Gu, W., Morales, C., and Hecht, N. B. 1995. in male mouse germ cells, copper-zinc superoxide dismutase utilizes alternative promoters that produce multiple transcripts with different translation potential. <i>The Journal Of Biological Chemistry</i> . 270(1): 236-243.
CP	Gu W(A), Morales, C., Hermo, L., and Hecht, N. B(A). 1994. in male mouse germ cells cu-zn superoxide dismutase in under both transcriptional and translational control with multiple transcripts from two promoters and differential polyadenylation. <i>Molecular Biology of the Cell</i> 5(SUPPL.): 222A.
Phys	Gu Wei and Hecht Norman B(A). 1997. the enzymatic activity of cu/zn superoxide dismutase does not fluctuate in mouse spermatogenic cells despite mrna changes. <i>Experimental Cell Research</i> 232(2): 371-375.
Org Met	Guarda, F., Soffietti, M. G., and Nebbia, C. 1985. experimental and spontaneous toxicology and pathology of zinc ethylenedithiocarbamate in animals. <i>Wiener Tierarztliche Monatsschrift</i> 72(5): 161-165.
No Oral	Gubrelay Udit, Mathur, R., and Flora, S. J. S(A). 1998. beneficial effects of combined administration of thiamine, methionine or zinc with few chelating agents in preventing acute cadmium toxicity in mice. <i>Indian Journal of Pharmacology</i> 30(1): 21-24.
Nut def	Guda, K. K(A), Freake, H. C(A), and Zinn, S. A(A). 1999. effect of zinc deficiency on thyroid hormone action in the rat. <i>Journal of Animal Science</i> 77(SUPPL. 1): 163-164.

- Chem Meth** Gudgin Dickson, E. F., Holmes, H., Jori, G., Kennedy, J. C., Nadeau, P., Pottier, R. H., Rossi, F., Russell, D. A., and Weagle, G. E. 1995. on the source of the oscillations observed during in vivo zinc phthalocyanine fluorescence pharmacokinetic measurements in mice. *Photochemistry and Photobiology* 61(5): 506-9.
- No Oral** Guenther, T., Grossrau, R., Hoellriegl, V., and Vormann, J. effects of iron, salicylate and zinc on metallothionein and lipid peroxidation in vivo. *J. Trace Elem. Electrolytes Health Dis.* (1991) 5(2): 95-100.
- Unrel** Guenther, T., Hoellriegl, V., and Vormann, J. perinatal development of iron and antioxidant defense systems. *J. Trace Elem. Electrolytes Health Dis.* (1993) 7(1): 47-52.
- Nut def** Guenther, T., Rebentisch, E., and Vormann, J. enhanced ototoxicity of salicylate by magnesium deficiency. *Magnesium-Bull.* (1989) 11(1): 15-18.
- Nut def** Guenther, Theodor, Gossrau, Reinhart, Vormann, Juergen, Hoellriegl, Vera, and Graf, Renate. maternal and fetal iron accumulation in zinc-deficient and salicylate-treated rats. *Biol. Trace Elem. Res.* (1988) : 18, 49-58.
- Nut def** Guenther, Thoedor, Rebentisch, Ekkehard, Vormann, Jurgen, Koenig, Michael, and Ising, Hartmut. enhanced ototoxicity of gentamicin and salicylate caused by magnesium deficiency and zinc deficiency. *Biol. Trace Elem. Res.* (1988) 16(1): 43-50.
- Unrel** Guettet, C., Rostaqui, N., Mathe, D., Lecuyer, B., Navarro, N., and Jacotot, B. 1991. effect of chronic glucagon administration on lipoprotein composition innormally fed, fasted and cholesterol-fed rats. *Lipids* 26(6): 451-458.
- Nut** Guggenheim, K., Ilan, J., Fostick, M., and Tal, E. 1965. the role of trace elements in the etiology of "meat anemia". *Israel Journal of Medical Sciences* 1(4): 734.
- CP** Guidolin D(A), Polato, P., Venturin, G., Zanotti, A., Mocchegiani, E., Fabris, N., Nunzi, M. G., <Book> Fabris N, Harman, D., Knook, D. L., Steinhagen-Thiessen, E., and Zs-Nagy I:= Eds. 1992. correlation between zinc level in hippocampal mossy fibers and spatial memory in aged rats. <book> annals of the new york academy of sciences; physiopathological processes of aging: towards a multicausal interpretation. *Annals of the New York Academy of Sciences* 673: 187-193.
- Nut def** Guilarte, T. R. and Miceli, R. C. 1992. maternal vitamin b-6 deficiency alters postnatal development and zinc regulation of tritiated mk801 binding to cortical nmda receptor-ion channels. *Society for Neuroscience Abstracts* 18(1-2): 1157.
- Phys** Guilarte, Tomas R., Miceli, Renee C., and Jett, David A. biochemical evidence of an interaction of lead at the zinc allosteric sites of the nmda receptor complex: effects of neuronal development. *Neurotoxicology* (1995) 16(1): 63-71.
- Ecol** Guilford Tim(A), Gagliardo Anna, Chappell Jackie, Bonadonna Francesco, Burt De Perera Theresa, and Holland Richard. 1998. homing pigeons use olfactory cues for navigation in england. *Journal of Experimental Biology* 201(6): 895-900.
- Nut def** Guillard, Olivier, Courtois, Philippe, Piriou, Alain, Saux, Marie Claude, and Dumas, Claudine. 1980. effect of a new zinc salt on experimental acrodermatitis enteropathica in rat. *J. Pharmacol.* 11(1): 33-41 .
- Carcin** Gulieva, S. A. and Stepanov, Yu. M. zinc, cobalt and copper indexes in the blood of rats in the developmental dynamics of innoculated tumors strains with and without hypothermia. *Azerb.*

Med. Zh. (1981) 58(8): 7-12 .

- FL** Gulii, M. F. and Sushkova, V. V. effect of sodium bicarbonate, mg^{2+} , mn^{2+} , and zn^{2+} on incorporation of carbon-14 from radioactive acetate into proteins, lipids, and glycogen of the liver and into serum proteins in chick of different age. *Ukr. Biokhim. Zh. (1970) 42(4): 484-8 .*
- FL** Gulyi, M. F., Mal'ko, V. A., and Mel'nichuk, D. A. 1970. [dependence of biochemical processes on the reaction of co_2 fixation in chickens]. <original> zalezhnist' biosyntetychnykh protsesiv vid reaktsii fiksatsii co_2 y kurei. *Ukrains'Ky Biokhimichni Zhurnal 42(6): 743-6.*
- Abstract** Gunasekera, S. W., King, L. J., and Parke, D. V. the excretion of zinc-65 zinc in the rat . *Biochemical Society Transactions. 1 (4). 1973 900-902*
- No Oral** Gunn, S. A., Gould, T. C., and Anderson, W. A. D. 1968; (REF:12). specificity in protection against lethality of testicular toxicity from cadmium. *Proc. Soc. Exp. Biol. Med. 128(2): 591-5.*
- No Oral** Gunn, S. A. Gould T. C. and Anderson W. A. D. 1963. the selective injurious response of testicular and epididymal blood vessels to cadmium and its prevention by zinc. *Am.J.Pathol. 42(6): 685-702.*
- Abstract** Gunter, S. A(A), Kegley, E. B., Duff, G. C., and Vermeire, D. 1999. the performance by steers fed different zinc sources before and during receiving at a new mexico feedlot. *Journal of Animal Science 77(SUPPL. 1): 19.*
- Nut def** Gunther, T., Gossrau, R., Vormann, J., Hollriegl, V., and Graf, R. maternal and fetal iron accumulation in zn-deficient and salicylate-treated rats. *Biological Trace Element Research. Dec 1988. v. 18 p. 49-58. ill.*
- Nut def** Gunther, T., Hollriegl, V., and Vormann, J. 1988. effects of salicylate and zinc deficiency on the serum concentrations of magnesium, calcium, and parathyroid hormone. *Biological Trace Element Research. 16(2): 129-135.*
- Nut def** Gunther, T., Rebentisch, E., Vormann, J., Konig, M., and Ising, H. 1988. enhanced ototoxicity of gentamicin and salicylate caused by mg deficiency and zn deficiency. *Biological Trace Element Research. 16(1): 43-50.*
- HHE** Guo, Rong and Quarles, L. D. 1997. cloning and sequencing of human pex from a bone cdna library: evidence for its developmental stage-specific regulation in osteoblasts. *Vol. 12, No. 7, Pp. 1009-1017 J. Bone Miner. Res.*
- No Dose** Gupta, Alka and Shukla, Girja S. 1996. ontogenic profile of brain lipids following perinatal exposure to cadmium. *J. Appl. Toxicol. 16(3): 227-233 .*
- Nut** Gupta, B. K., Ahuja, A. K., and Malik, N. S. 1994. preliminary studies on leucaena as a source of protein in complete feed pellets for buffaloes. *Indian Journal of Dairy Science 46(12): 583-584.*
- Drug** Gupta, B. S., Arora, S. P., Richaria, V. S., Ranjhan, S. K., Dhodapkar, B. S., Vegad, J. L., and Byers, J. H. 1972. dietary investigation of cause of suspected parakeratosis in swine. *Indian Journal of Animal Health 11(No.1): 65-68.*
- Nut def** Gupta, R. P. and Verma, P. C. 1992. effect of experimental zinc deficiency on protein and feed efficiency ratios in guinea-pigs. *Indian Journal of Nutrition and Dietetics 29(11): 342-344.*
- Nut def** Gupta, R. P., Verma, P. C., and Garg, S. L. effect of experimental zinc deficiency on thyroid

- gland in guinea - pigs. *Ann. Nutr. Metab.* (1997) 41(6): 376-381.
- Nut def** Gupta, R. P., Verma, P. C., and Gupta, R. K. 1986. experimental zinc deficiency in guinea-pigs: biochemical changes. *British Journal of Nutrition* 55(3): 613-20.
- Nut def** Gupta, R. P., Verma, P. C., and Gupta, R. K. P. 1985. experimental zinc deficiency in guinea-pigs: clinical signs and some haematological studies. *The British Journal Of Nutrition.* 54(2): 421-428.
- Nut def** Gupta, R. P., Verma, P. C., and Gupta, R. K. Paul. experimental zinc deficiency in guinea pigs : biochemical changes. *Br. J. Nutr.* (1986) 55(3): 613-20 .
- Nut def** Gupta, R. P., Verma, P. C., and Gupta, R. K. Paul. 1985. experimental zinc deficiency in guinea - pigs : clinical signs and some haematological studies. *Br. J. Nutr.* 54(2): 421-8 .
- Nut def** Gupta, R. P., Verma, P. C., Sadana, J. R., and Gupta, R. K. 1988. studies on the pathology of experimental zinc deficiency in guinea-pigs. *Journal of Comparative Pathology* 98(4): 405-13.
- Nut def** Gupta, R. P., Verma, P. C., Sadana, J. R., and Gupta, R. K. Paul. studies on the pathology of experimental zinc deficiency in guinea pigs. *J. Comp. Pathol.* (1988) 98(4): 405-13 .
- Nut def** Gupta, R. P., Verma, P. C., Sadana, J. R., and Gupta, V. K. 1989. effect of experimental zinc deficiency and repletion on sodium, potassium, copper and iron concentrations in guinea pigs. *Br. J. Nutr.* 62(2): 407-14 .
- No Oral** Gupta, T., Talukder, G., and Sharma, A. 1991. cytotoxicity of zinc chloride in mice in vivo. *Biological Trace Element Research* 30(2): 95-101.
- Drug** Gurney Mark E(A), Cutting Frank B, Zhai Ping, Doble Adam, Taylor Charles P, Andrus Paula K, and Hall Edward D. 1996. benefit of vitamin e, riluzole, and gabapentin in a transgenic model of familial amyotrophic lateral sclerosis. *Annals of Neurology* 39(2): 147-157.
- IMM** Gurr, M. I. 1983. the role of lipids in the regulation of the immune system. *Progress in Lipid Research* 22(4): 257-87.
- Meth** Gutheil, William G., Holmquist, Barton, and Vallee, Bert L. purification, characterization, and partial sequence of the glutathione-dependent formaldehyde dehydrogenase from escherichia coli: a class iii alcohol dehydrogenase. *Biochemistry* (1992) 31(2): 475-81
- Surv** Guthova, Z. 1993. reproduction disorders in black-headed gull (larus ridibundus) from a suburban colony near ceske budejovice, southern bohemia. *FOLIA ZOOLOGICA.* 42(4): 95-302.
- No Oral** Guthrie, J. zinc induction of testicular teratomas in japanese quail (coturnix coturnix japonica) after photoperiodic stimulation of testis. *Brit. J. Cancer* (1971) 25(2): 311-14
- No Oral** Guthrie, John and Guthrie, Olive A. embryonal carcinomas in syrian hamsters after intratesticular inoculation of zinc chloride during seasonal testicular growth. *Cancer Res.* (1974) 34(10): 2612-14 .
- FL** Gutkovich, Ya. L. effect of zinc on protein and lipid metabolism in rabbits. *Uch. Zap. Vitebsk. Vet. Inst.* (1969) : 21, 54-9.
- Nut** Gutkovich, Ya. L. effect of zinc on the chemical composition of rabbit meat. *Myas. Ind. SSSR* (1972) (4): 39-40.

- Org Met** Guven, Kemal, Deveci, Engin, Akba, Osman, Onen, Abdurrahman, and De Pomerai, David. the accumulation and histological effects of organometallic fungicides propineb and maneb in the kidneys of fetus and female rats during pregnancy. *Toxicol. Lett.* (1998) 99(2): 91-98 .
- Org Met** Guven, Kemal, Deveci, Engin, and De Pomerai, David. the accumulation and histological effects of the organometallic fungicide propineb on the organs of fetuses and female rats during pregnancy. *Turk. J. Biol.* (1999) 23(4): 413-422 .
- Drug** Guven, Y., Yildirim, S., and Kasapoglu, C. 1993. the effect of toxic doses of cholecalciferol (vitamin d3) on the serum zinc levels in rats. *Biological Trace Element Research.* 37(1): 85-89.
- FL** Guyomard, S. and Darbord, J. C. 1985. [quantitative determination of bacterial endotoxins by the chromogenic limulus method: critical analysis and study of interactions between 3 divalent cations]. <original> determination quantitative des endotoxines bacteriennes par la methode "limulus" chromogenique: analyse critique et etude des interactions de trois cations divalents. *Annales De L'Institut Pasteur. Microbiologie* 136B(1): 49-55.
- Alt** Ha, Y. H. and Milner, J. A. factors affecting urea cycle operation in streptozotocin diabetic rats. . *Federation Proceedings.* 38 (3 Part 1). 1979 286
- In Vit** Habara-Ohkubo Akemi, Shirahata Toshikazu, Takikawa Osamu, and Yoshida Ryotaro(A). 1993. establishment of an antitoxoplasma state by stable expression of mouse indoleamine 2,3-dioxygenase. *Infection and Immunity* 61(5): 1810-1813.
- FL** Hackenhaar, L. 1995. the response of weanling pigs to increasing iron levels, inorganic or chelated, of high copper and zinc starter diets. <original> niveis de ferro, inorganico ou quelatado, em racoes iniciais de suinos com altos niveis de cobre e de zinco. 85 P.
- Abstract** Hackman, R. M. and Hurley, L. S. 1981. the effect of dietary zinc and genetic interaction on acetazolamide teratogenesis in mice. *Teratology* 23: A39-A40.
- Abstract** Hackman, R. M. and Hurley, L. S. 1981. the influence of dietary zinc and genetic strain on salicylate teratogenesis in rats. *Teratology* 23: A40.
- Alt** Hackman, R. M. and Hurley, L. S. 1983. interaction of dietary zinc, genetic strain, and acetazolamide in teratogenesis in mice. *Teratology* 28(3): 355-68.
- Nut def** HACKMAN, R. M. and HURLEY, L. S. 1981. interactions of zinc, salicylate and genetic factors in teratogenesis in rats. *FED PROC FED AM SOC EXP BIOL* 40:917,1981
- Diss** Hackman, Robert Mark. 1981. the influence of dietary zinc and genetic factors on drug-induced malformations in rats and mice. Avail.: Univ. Microfilms Int. Order No. DA8205005 From: Diss. Abstr. Int. B 1982, 42. 9. 3636. 155 pp.
- No Control** Hackman, Robert M. and Hurley, Lucille S. 1984. interactions of salicylate, dietary zinc, and genetic strain in teratogenesis in rats. *Teratology* 30(2): 225-36.
- Rev** Hadden, J. W. 1998. thymic endocrinology. *Annals of the New York Academy of Sciences* 840: 352-8.
- In Vit** Haebisch, Eva Maria Augusta Boeckh and Alonso, Carmen Castilho. cationic concentrations in the myocardium and skeletal muscle of normal and hypertensive (shr) rats , both young and old. *Arq. Bras. Cardiol.* (1987) 49(3): 133-8.

- Gene** Haenlin, M., Cubadda, Y., Blondeau, F., Heitzler, P., Lutz, Y., Simpson, P., and Ramain, P. 1997. transcriptional activity of pannier is regulated negatively by heterodimerization of the gata dna-binding domain with a cofactor encoded by the u-shaped gene of drosophila. *Genes & Development* 11(22): 3096-108.
- Nut def** Hafiez, A. A., el-Kirdassy, Z. H., Mansour, M. M., Sharada, H. M., and el-Zayat, E. M. 1989. role of zinc in regulating the testicular function. part 1. effect of dietary zinc deficiency on serum levels of gonadotropins, prolactin and testosterone in male albino rats. *Die Nahrung* 33(10): 935-40.
- Nut def** Hafiez, A. A., El-Kirdassy, Z. H. M., El-Malkh, N. M., and El-Zayat, E. M. role of zinc in regulating the testicular function. part 3. histopathological changes induced by dietary zinc deficiency in testes of male albino rats. *Nahrung (1990)* 34(1): 65-73.
- Nut def** Hafiez, A. A., El-Kirdassy, Z. H. M., Mansour, M. M. S., Sharada, H. M., and El-Zayat, E. M. I. role of zinc in regulating the testicular function. part 1. effect of dietary zinc deficiency on serum levels of gonadotropins, prolactin and testosterone in male albino rats. *Nahrung (1989)* 33(10): 935-40.
- Nut def** Hafiez, A. A., Moussa, N. M., and Hyat, Lamy H. role of zinc in regulation of testicular function. i. effect of zinc-deficiency on protease activity and protein content of the testes. *Egypt. J. Physiol. Sci. (1982)* Volume Date 1980, 7(2): 109-19 .
- Nut def** Hafiez, A. A., Moussa, N. M., and Hyat, Lamy H. role of zinc in regulation of testicular function. iii. effect of zinc deficiency on nucleic acids metabolism. *Egypt. J. Physiol. Sci. (1983)* Volume Date 1982, 9(1-2): 63-72 .
- CP** Hagay Z(A), Weiss, Y., Zusman, I., Kidron, D., Eriksson, U. J., and Groner, Y. 1995. diabetic embryopathy is prevented in transgenic mice overexpressing time radical scavenging enzyme superoxide dismutase (sod). *Diabetologia* 38(SUPPL. 1): A21.
- CP** Hagay Zion(A), Weiss Yael, Zusman Igor, Kidron Dvora, Eriksson Ulf J, Reece, E. Albert, and Groner Yoram. 1995. prevention of diabetic-embryopathy by overexpression of the free radical scavenging enzyme, superoxide dismutase in transgenic mouse embryos. *American Journal of Obstetrics and Gynecology* 172(1 PART 2): 254.
- Alt** Hagay Zion J(A), Weiss Yael, Zusman Igor, Peled-Kamar Mira, Reece, E. Albert, Eriksson Ulf J, and Groner Yoram. 1995. prevention of diabetes-associated embryopathy by overexpression of the free radical scavenger copper zinc superoxide dismutase in transgenic mouse embryos. *American Journal of Obstetrics and Gynecology* 173(4): 1036-1041.
- FL** Hagemeister, H., Scholtissek, J., and Barth, C. A. 1998. influence of heat treatment of milk on bioavailability of iron, copper and zinc. *Archiv Fur Tierzucht* 41(3): 261-268.
- Nut def** Hager, Mary Hastings. zinc deficiency compromises adrenal response to sodium deprivation in rats. *Nutr. Rep. Int. (1986)* 34(1): 141-52.
- No Oral** Haggendal, J., Jonsson, L., Johansson, G., Bjurström, S., Carlsten, J., and Thoren-Tolling, K. 1987. catecholamine-induced free radicals in myocardial cell necrosis upon experimental stress in pigs. *Acta Physiologica Scandinavica* 131(3): 447-452.
- FL** Hahn von Dorsche, H. and Wolter, S. 1973. [investigations on the use of the fixation with glutaraldehyde in the histology and the histochemistry of substrates (author's transl)]. <original> untersuchungen uber anwendungsmöglichkeiten der glutaraldehyd-fixierung in der histologie und baustein histochemie. *Acta Histochemica* 47(2): 367-75.

- Phys** Haidara, K., Moffatt, P., and Denizeau, F. 1999. metallothionein induction attenuates the effects of glutathione depletors in rat hepatocytes. *Toxicological Sciences* 49(2): 297-305.
- FL** Haider, I. 1978. fattening and carcass performance of pigs given field beans andpronifer c. *Wiener Tierarztliche Monatsschrift* 65(10): 297-301.
- No COC** Hakim, N. F. A., Hilali, E. A., Amer, A. A., and Younis, T. M. effect of some antibiotics as growth promoters on performance of broiler chicks fed different protein levels. *Archives of Animal Nutrition*. 39 (1-2). 1989. 97-104.
- Abstract** Halas, E., Heinrich, M., and Sandstead, H. effects of pre natal mal nutrition on feeding behavior in adult rats. *Federation Proceedings*. 36 (3). 1977 1175
- CP** Halas, E. S. comparing the effects of mild and severe perinatal zinc deficiency on memory and learning in adult rats. *Trace Elements In Man And Animals : Tema 5 : Proceedings Of The Fifth International Symposium On Trace Elements In Man And Animals / Editors C.f. Mills, I. Bremner, & J.k. Chesters*. p. 222-225.
- Nut def** Halas, E. S., Eberhardt, M. J., Diers, M. A., and Sandstead, H. H. 1983. learning and memory impairment in adult rats due to severe zinc deficiency during lactation. *Physiology and Behavior* 30(3): 371-381.
- Nut def** Halas, E. S., Hanlon, M. J., and Sandstead, H. H. 1975. intrauterine nutrition and aggression. *Nature, UK* 257(5523): 221-222.
- Abstract** Halas, E. S., Heinrich, M. D., and Sandstead, H. H. effects of post natal mal nutrition on long-term memory. *Federation Proceedings*. 38 (3 Part 1). 1979 558
- Nut def** Halas, E. S., Heinrich, M. D., and Sandstead, H. H. long-term memory deficits in adult rats due to post natal mal nutrition. *Physiology & Behavior*. 22 (5). 1979. 991-998.
- Abstract** Halas, E. S. and Hunt, C. D. multigenerational effects of mild perinatal zinc deficiency on behavior and hippocampal morphology in adult rats. *ABSTRACTS FROM THE 14TH ANNUAL MEETING OF THE SOCIETY FOR NEUROSCIENCE, PART 1, ANAHEIM, CALIF., USA, OCT. 10-15, 1984. SOC NEUROSCI ABSTR*. 10 (1). 1984. 134.
- Nut def** Halas, E. S., Hunt, C. D., and Eberhardt, M. J. 1986. learning and memory disabilities in young adult rats from mildly zinc deficient dams. *Physiology & Behavior* 37(3): 451-8.
- Nut def** HALAS, E. S., HUNT, C. D., and EBERHARDT, M. J. learning and memory disabilities in young adult rats rom mildly zinc deficient dams. *PHYSIOL BEHAV* 37:451-458,1986
- Abstract** Halas, E. S., Lokken, P., and Sandstead, H. H. zinc deficiency effect on learning. *FED PROC. Federation Proceedings*. 32 (3 Part 1). 1973 909
- Nut def** HALAS, E. S. and SANDSTEAD, H. H. prenatal zinc deficiency:effects on avoidance conditioning. *FED PROC FED AM SOC EXP BIOL* 33:464,1974
- Nut def** Halas, E. S. and Sandstead, H. H. 1975. some effects of prenatal zinc deficiency on behavior of the adult rat. *Pediatric Research* 9(2): 94-97.
- Abstract** Halas, E. S., Tinius, T. P., and Beckwith, B. E. differences in passive avoidance behavior due to mild perinatal zinc deficiency and-or undernutrition. *15TH ANNUAL MEETING OF THE SOCIETY FOR NEUROSCIENCE, PART 1, DALLAS, TEX., USA, OCT. 20-25, 1985. SOC NEUROSCI ABSTR*. 11 (1). 1985. 68.

- Nut def** Halas, E. S., Wallwork, J. C., and Sandstead, H. H. mild zinc deficiency and under nutrition during the pre natal and post natal periods in rats effects on weight food consumption and brain catecholamine concentrations. *Journal of Nutrition*. 112 (3). 1982. 542-551.
- Nut def** Halas, Edward S., Heinrich, Myra D., and Sandstead, Harold H. long term memory deficits in adult rats due to postnatal malnutrition. *Physiol. Behav.* (1979) 22(5): 991-7.
- Nut def** Halas, Edward S., Hunt, Curtiss D., and Eberhardt, Marilou J. learning and memory disabilities in young adult rats from mildly zinc deficient dams. *Physiol. Behav.* (1986) 37(3): 451-8.
- Nut def** Halas, Edward S. and Kawamoto, Jerrolynn C. correlated behavioral and hippocampal effects due to perinatal zinc deprivation. *Neurol. Neurobiol.* (1984) 11B(Neurobiol. Zinc, Part B): 91-107.
- Nut def** Halas, Edward S., Rowe, Michael C., Johnson, Orris R., McKenzie, Joan M., and Sandstead, Harold H. effects of intrauterine zinc deficiency on subsequent behavior. *Trace Elem. Hum. Health Dis.* (1976) Volume 1, 327-43. Editor: Volume 1, 327-43. Editor(s): Prasad, Ananda S.; Oberleas, Donald. Publisher: Academic, New York, N. Y..
- Nut def** Halas, Edward S. and Sandstead, Harold H. malnutrition and behavior: the performance versus learning problem revisited. *The Journal Of Nutrition*. Sept 1980. v. 110 (9) p. 1858-1864. ill.
- No Oral** HALATEK, T., CHMIELNICKA, J., and STETKIEWICZ, J. biochemical indicators and critical concentration of cadmium for renal damage in rats. *J TRACE ELEM EXP MED*; 3 (3). 1990. 179-192.
- No COC** Hale, O. M. and McCormick, W. C. influence of diethylstilbestrol and sex on performance, serumcholesterol and mineral content of swine tissues. *Georgia Agricultural Research| PY-1976| VO- 18| IS- 2| PG- P.9-12*
- Nut def** Hales, E. S. and Sanstead, H. H. effects of prenatal zinc deficiency on hebehavior of the adult rat. *Pediatr. Res.* (1975) 9(2): 94-7.
- Nut def** Halevy, O. and Sklan, D. 1986. effect of copper and zinc depletion on vitamin a and triglyceridemetabolism in chick liver. *Nutrition Reports International* 33(5): 723-727.
- Mix** Hall, A. C., Young, B. W., and Bremner, Ian. intestinal metallothionein and the mutual antagonism between copper and zinc in the rat. *J. Inorg. Biochem.* (1979) 11(1): 57-66.
- Sludge** Hall, A. Tilghman, Taylor, Douglas H., and Woods, Paul E. effects of municipal sludge on locomotor activity and exploratory behavior of meadow voles, *microtus pennsylvanicus*. *Environ. Toxicol. Chem.* (1990) 9(1): 31-6.
- No Oral** Hallmans, G. 1978. local absorption of zinc from wounds treated with different concentrations of zinc sulphate. *Acta Dermato-Venereologica* 58(5): 413-9.
- Drug** Hallmans, G. and Lasek, J. 1985. the effect of topical zinc absorption from wounds on growth and the wound healing process in zinc-deficient rats. *Scandinavian Journal of Plastic and Reconstructive Surgery* 19(2)
- Nut def** Hallmans, G., Nilsson, U., Nygren, C. h., Sjoestrom, R., Wetter, L., and Wing, K. 1982. tissue concentrations of zinc and iron in rats fed endosperm wheat bread supplemented with iron or whole grain wheat bread. *IN "PROC. 2ND INT. WORKSHOP TRACE ELEMENT ANALY. CHEM. IN MED. & BIOL.* p. 5.

- CP** Hallmans, G., Nilsson, U., Sjoestroem, R., Wetter, L., and Wing, K. 1985. the bioavailability of zinc in endosperm, whole grain and bran-enriched wheat crisp breads fed to rats on a zinc-deficient diet. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th* : Meeting Date 1984, 449-51. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK..
- Not Avail** Hallmans G], J. N. wound healing with adhesive zinc tape. an animal experimental study.
- CP** Hallmans, Goeran, Nilsson, Ulf, Nygren, Charlotte, Sjoestroem, Rolf, Wetter, Lars, and Wing, Kenneth. 1983. tissue concentrations of zinc and iron in rats fed whole grain wheat bread or endosperm wheat bread supplemented with iron. *Trace Elem. Anal. Chem. Med. Biol. Proc. Int. Workshop, 2nd* : Meeting Date 1982, 61-74. Editor(s): Braetter, Peter; Schramel, Peter. Publisher: de Gruyter, Berlin, Fed. Rep. Ger..
- FL** Hallmans, Goeran, Nilsson, Ulf, Sjoeborg, Rolf, Wetter, Lars, and Wing, Kenneth. effects of dietary fiber and phytate on the bioavailability of zinc studied by the isotope and balance techniques in rats. *Suppl. Naeringsforsk. (1984)* 20(Kostfiber): 59-61
- CP** Hallmans, Goeran, Nilsson, Ulf, Sjoestroem, Rolf, Wetter, Lars, and Wing, Kenneth. 1983. the intestinal absorption in the rat of zinc-65 and iron-59 from endosperm wheat bread with and without zinc and iron supplementation. *Trace Elem. Anal. Chem. Med. Biol. Proc. Int. Workshop, 2nd* : Meeting Date 1982, 137-51. Editor(s): Braetter, Peter; Schramel, Peter. Publisher: de Gruyter, Berlin, Fed. Rep. Ger..
- CP** Hallmans, Goeran, Nilsson, Ulf, Sjoestroem, Rolf, Wetter, Lars, and Wing, Kenneth. 1983. the intestinal distribution and absorption of zinc-65 and iron-59 in rats fed endosperm wheat bread supplemented with zinc and iron as mineral salts or in bran. *Trace Elem. Anal. Chem. Med. Biol. Proc. Int. Workshop, 2nd* : Meeting Date 1982, 117-35. Editor(s): Braetter, Peter; Schramel, Peter. Publisher: de Gruyter, Berlin, Fed. Rep. Ger..
- Nut def** Hallmans, Goeran, Sjoestroem, Rolf, Wetter, Lars, and Wing, Kenneth R. the availability of zinc in endosperm, whole grain and bran-enriched wheat crispbreads fed to rats on a zinc-deficient diet. *Br. J. Nutr. (1989)* 62(1): 165-75.
- No COC** Halmagyine, V. T. and Toth, M. effects of a new antibiotic kormogrizin on the fattening results of broiler chickens. *. Allattenyesztes Es Takarmanyozas. 33 (2). 1984. 173-177.*
- HHE** Halsted, James A and Smith, J Cecil Jr. a conspectus of research on zinc requirements of man. *J Nutr* Mar 1974 104 (3): 345-378
- No COC** Hama, T. and Guroff, G. 1985. distribution of nsp100 and nsp100 kinase, a nerve growth factor-sensitive phosphorylation system, in rat tissues. *Journal of Neurochemistry* 45(4): 1279-87.
- No COC** Hamalainen, M. M. and Makinen, K. K. 1989. polyol-mineral interactions in the diet of the rat with special reference to the stabilities of polyol-metal complexes. *Nutr. Res. (N. Y.)* 9(7): 801-11 .
- HHE** Hambidge, K. M., Krebs, N. F., Jacobs, M. A., Favier, A., Guyette, L., and Ikle, D. N. 1983. zinc nutritional-status during pregnancy - a longitudinal-study. *American Journal Of Clinical Nutrition* 37(3): 429-442.
- HHE** Hambidge, K. M., Walravens, P. A., Casey, C. E., Brown, R. M., and Bender, C. plasma zinc concentrations of breast fed infants. *Journal of Pediatrics.* 94 (4). 1979. 607-608.
- FL** Hamdaoui, M., Hedhili, A., Doghri, T., and Tritar, B. effect of tea decoction given to rats ad

libitum for a relatively long time on body weight gains and iron, copper, zinc, magnesium concentrations in blood, liver, duodenum, and spleen. *Ann. Nutr. Metab.* (1997) 41(3): 196-202.

- No COC** Hamel, F. G., Gehm, B. D., Rosner, M. R., and Duckworth, W. C. 1997. identification of the cleavage sites of transforming growth factor alpha by insulin-degrading enzymes. *Biochimica Et Biophysica Acta* 1338(2): 207-14.
- No COC** Hamid, A., Khan, F. Z., Munid Ahmad, and Qadeer, M. A. 1994. probiotics in poultry production. *Bangladesh Journal of Scientific and Industrial Research* 29(4): 1-12.
- FL** Hamilton, D. L., Bellamy, J. E. C., Valberg, J. D., and Valberg, L. S. zinc, cadmium, and iron interactions during intestinal absorption in iron-deficient mice. *Can. J. Physiol. Pharmacol.* (1978) 56(3): 384-9.
- FL** Hamilton, D. L., Bellamy, J. E. C., Valberg, J. D., and Valberg, L. S. zinc calcium and iron interactions during intestinal absorption in iron deficient mice. *Canadian Journal of Physiology and Pharmacology.* 56 (3). 1978 384-389.
- Abstract** Hammermueller, J. D., Bettger, W. J., and Bray, T. M. effect of dietary zinc deficiency on membrane fluidity in rat lung and liver microsomes an esr spin labeling study. *73RD ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, NEW ORLEANS, LOUISIANA, USA, MARCH 19-23, 1989. FASEB (FED AM SOC EXP BIOL) J.* 3 (3). 1989. A651.
- Abstract** Hammermueller, J. D., Bettger, W. J., and Bray, T. M. the effect of dietary zinc or copper deficiency on the membrane environment of rat lung and liver microsomes. *72ND ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, LAS VEGAS, NEVADA, USA, MAY 1-5, 1988. FASEB (FED AM SOC EXP BIOL) J.* 2 (4). 1988. Abstract 3316.
- Nut def** Hammermueller, J. D., Bray, T. M., and Bettger, W. J. 1987. effect of zinc and copper deficiency on microsomal nadph-dependent active oxygen generation in rat lung and liver. *The Journal Of Nutrition.* 117(5): 894-901.
- Nut def** Hammermueller, Jutta D., Bray, Tammy M., and Bettger, William J. effect of zinc and copper deficiency on microsomal nadph-dependent active oxygen generation in rat lung and liver. *J. Nutr.* (1987) 117(5): 894-901.
- Abstract** Hampton, D. L. and Miller, W. J. development of a new approach to the study of mineral absorption sites in animals. *Bulletin of the Georgia Academy of Science.* 34 (2). 1976 55
- Nut def** Hampton, D. L., Miller, W. J., Blackmon, D. M., Gentry, R. P., Neathery, M. W., Lassiter, Kincaid, R. L., and Stake, P. E. 1976. zinc absorption from the small intestine in young calves. *Journal of Dairy Science* 59(4): 712-5.
- No Oral** Hampton, D. L., Miller, W. J., Blackmon, D. M., Gentry, R. P., Neathery, M. W., Lassiter, J. W., Kincaid, R. L., and Stake, P. E. zinc absorption from the small intestine in young calves. *J. Dairy Sci.* (1976) 59(4): 712-15 .
- Abstract** Hampton, D. L., Miller, W. J., Blackmon, D. M., Gentry, R. P., Neathery, M. W., and Stake, P. E. intestinal sites of zinc absorption in intact male holstein calves. *Federation Proceedings.* 34 (3). 1975 907
- Abstract** Hampton, D. L., Miller, W. J., Neathery, M. W., Blackmon, D. M., Kincaid, R. L., Gentry, R. P.,

and Lassiter, J. W. zinc absorption sites in calves fed a high zinc diet. *Journal of Dairy Science*. 59 (1). 1976 13

- Nut def** Hampton, D. L., Miller, W. J., Neathery, M. W., Kincaid, R. L., and Gentry, R. P. intestinal sites of zinc absorption as determined by direct zinc-65 dosing of intact rats. *Nutrition Reports International*. 14 (6). 1976 691-697.
- No Oral** Hampton, D. L., Miller, W. J., Neathery, M. W., Kincaid, R. L., and R. P. intestinal sites of zinc absorption as determined by direct 65zn of intact rats. *Nutrition Reports International* | PY- 1976 | VO- 14 | IS- 6 | PG- Which Contained Zn 2 Mg/Kg Without or With Added Zn 40 or 600 Mg/Kg As ZnO. After 2 Weeks the Intestine Was Exposed by a Midline Abdominal Incision and Each Rat Was Given by Injection 65Zn 28 Mu Ci Directly into the Lumen of the Intestinal Tract at Different Sites Posterior to the Pyloric Valve. The Rats Were Killed 24 h Later and 65Zn Was Estimated in Blood, Liver, Kidneys, Heart, Spleen, Bone and Muscle. Tissue 65Zn Retention Values Were Plotted Against Site of Injection, Expressed As Percentage of Intestinal Length From Proximal to Distal End. Zn Absorption, Per Unit of Intestinal Length, Was Similar Throughout the Small Intestine With Some Indication of More Absorption Near the Distal End, Especially in Rats on the Low-Zn Diet.
- FL** Han, I. K., Lee, C. H. Seoul National University Suwon Korea Republic College of Agriculture and Life Sciences, and Shin, I. S. American Soybean Association Seoul Korea Republic. 1995. supplementation of copper, zinc and iron to broiler diet with different levels of methionine. *Korean Journal of Animal Nutrition and Feedstuffs*. V. 19(6) P. 458-467
- FL** Han Jingkan, Li Dongjiao, and Liu Zhonglu (Veterinary Coll. of PLA, Changchun China. 1991. effects of high dietary calcium on deposition of zn 65 in bodies of layer chickens. *Journal of Jilin Animal Husbandry and Veterinary Medicine*. V. 13(4) P. 1-3
- Mineral** Han Jingkan, Li Dongjiao, and Zhu Lianqin (Veterinary Coll. of PLA, Changchun China Inst. of Military Veterinary Medicine. 1990. effect of dietary calcium on the serum hormone in hens. *Bulletin of Veterinary College of PLA*. V. 10(4) P. 375-377
- FL** Han Jingkan and Li Dongjiao (Veterinary Coll. of PLA, Changchun China Inst. of Military Veterinary Medicine. 1990. influence of high level of dietary calcium upon absorption of zinc in layer chickens. *Bulletin of Veterinary College of PLA*. V. 10(2) P. 178-180
- No Dose** Han, Shenggao, Li, Wenjie, Jamil, Uzma, Dargan, Kyle, Orefice, Michelle, Kemp, Francis W., and Bogden, John D. 1999. effects of weight loss and exercise on the distribution of lead and essential trace elements in rats with prior lead exposure. *Environ. Health Perspect*. 107(8): 657-662 .
- CP** Han, Shenggao, Qiao, Xianwen, Kemp, Francis W., and Bogden, John D. 1996. age at lead exposure influences lead retention in bone. *Ther. Uses Trace Elem. [Proc. Int. Congr. Trace Elem. Med. Biol.]*, 5th : 303-307. Editor(s): Neve, Jean; Chappuis, Philippe; Lamand, Michel. Publisher: Plenum, New York, N. Y..
- No Dose** Han, Shenggao, Qiao, Xianwen, Kemp, Francis W., and Bogden, John D. 1997. lead exposure at an early age substantially increases lead retention in the rat. *Environ. Health Perspect*. 105(4): 412-417 .
- BioX** Hanada, K., Sawamura, D., Hashimoto, I., Kida, K., and Naganuma, A. 1998. epidermal proliferation of the skin in metallothionein-null mice. *Journal of Investigative Dermatology* 110(3): 259-62.
- Nut** Hanai, Miho and Esashi, Takatoshi. 1999. effects of dietary mineral levels and their

interactions with calcium, phosphorus, magnesium, and zinc balance in male rats . investigations based on a l8(27)-type orthogonal array. *Nippon Eiyo Shokuryo Gakkaishi* 52(4): 193-199 .

- Effl** HANCZAKOWSKI, P., SZYMCZYK, B., and WAWRZYNSKI, M. composition and nutritive value of sewage-grown duckweed (lemna minor l.) for rats. *ANIMAL FEED SCIENCE AND TECHNOLOGY*; 52 (3-4). 1995. 339-343.
- Nut** Hankins, C. C., Veum, T. L., and Reeves, P. G. 1985. effects of autoclaved-spray-dried egg white as the sole source of dietary protein on zinc requirement and performance of the baby pig. *Nutrition Reports International* 31(5): 1057-1070.
- Nut def** Hankins, C. C., Veum, T. L., and Reeves, P. G. 1985. zinc requirement of the baby pig when fed wet-autoclaved spray-dried egg albumen as the protein source. *Journal of Nutrition* 115(12): 1600-1612.
- Abstract** HANLON, D. P. and FERM, V. H. possible mechanisms of metal ion induced teratogenesis. *TERATOLOGY* 9:18A-19A,1974
- Nut def** Hanna, L., Peters, J., Wiley, L., Zidenber-Cherr, S., and Keen, C. influence of maternal zinc deficiency and irradiation on in utero development in mice. *FASEB J* 1997 Feb;11(3):A408
- Nut def** Hanna, L. A., Clegg, M. S., Wiley, L. M., and Keen, C. L. peri-implantation mouse embryos grown in zinc deficient medium demonstrate abnormal development. *Teratology* 1997 Jan;55(1):54
- Nut def** Hanna, Lynn A., Peters, Jeffrey M., Wiley, Lynn M., Zidenberg-Cherr, Sheri, and Keen, Carl L. 1997. enhancing effect of maternal zinc deficiency and 137cs .gamma.-irradiation on the frequency of fetal malformations in mice. *Teratog. Carcinog., Mutagen.* 17(3): 127-137.
- No Oral** Hanna, P. M. Kadiiska M. B. Jordan S. J. and Mason R. P. 1993. role of metallothionein in zinc(ii) and chromium(iii) mediated tolerance to carbon tetrachloride hepatotoxicity: evidence against a trichloromethyl radical-scavenging mechanism. *Chem.Res.Toxicol.* 6(5): 711-717.
- No Dose** HANNAH, R. S. and MOORE, K. L. effects of fasting and insulin on skeletal development in rats. *TERATOLOGY* 4:135-140,1971
- Drug** Hannigan, J. H. 1995. effects of prenatal exposure to alcohol plus caffeine in rats: pregnancy outcome and early offspring development. *Alcoholism, Clinical and Experimental Research* 19(1): 238-46.
- Unrel** Hansen, B., Hoeiriis Nielsen, J., Welinder, B., Keck, K., and Erb, P. eds. 1981. immunogenicity of insulin in relation to its physico-chemical properties. basic and clinical aspects of immunity to insulin. *Pp.* 335-352
- Rev** Hansen, C. R., Malecha, M., Mackenzie, T. B., and Kroll, J. 1983. copper and zinc deficiencies in association with depression and neurological findings. *Biological Psychiatry* 18(3): 395-401.
- Phys** Hansen, L. F., Hammer, M., Petersen, S. H., and Nielsen, G. D. 1994. effects of intranasal znso4 irrigation on olfactory and trigeminal cues. *Physiology & Behavior* 55(4): 699-704.
- Org Met** Hanson, Rew. control of prairie dogs and related developments in south dakota. *FWS Biol Report* 13. P5(3)
- FL** Hap, I. and Simecek, K. 1994. relationship between zn intake, zn absorption and zn content

in piglets. *Archiv Fur Tierzucht* 37(6): 633-641.

- Org Met** Haque, M. E. Bangladesh Agricultural Research Inst. Gazipur Bangladesh Entomology Div. 1993. test of ld50 and bait efficacy with zinc phosphide on short tailed mole rat, *nesokia indica* (gray) in bangladesh. *Bangladesh Journal of Entomology*. V. 3(1-2) P. 27-32
- Phys** Hara, Hiroshi, Konishi, Ayako, and Kasai, Takanori. contribution of the cecum and colon to zinc absorption in rats. *J. Nutr.* (2000) 130(1): 83-89.
- Phys** Harada Keiko. 1994. induction of renal metallothionein in ischemic acute renal failure in the rat. *Okayama Igakkai Zasshi* 106(7): 811-823.
- Unrel** HARADA, Y., HAGA, K., OSADA, T. , and KOSHINO, M. quality of compost produced from animal wastes. *JARQ (JPN AGRIC RES Q)*; 26 (4). 1993. 238-246.
- No COC** Hardie-Muncy, D. A. and Rasmussen, A. I. 1979. interrelationships between zinc and protein level and source in weanling rats. *Journal of Nutrition* 109(2): 321-329.
- Nut def** Hardie-Muncy, Darlene A. and Rasmussen, Arlette I. interrelationships between zinc and protein level and source in weanling rats. *J. Nutr.* (1979) 109(2): 321-9 .
- Nut def** Harding, A. J., Dreosti, I. E., and Tulsi, R. S. teratogenic effect of vitamin e and zinc deficiency in the 11 day rat embryo. *Nutr. Rep. Int.* (1987) 36(3): 473-82.
- Nut def** Harding, A. J., Dreosti, I. E., and Tulsi, R. S. zinc deficiency in the 11 day rat embryo: a scanning and transmission electron microscope study. *Life Sci.* (1988) 42(8): 889-96.
- No Oral** Harding, J. W., Getchell, T. V., and Margolis, F. L. 1978. de nervation of the primary olfactory pathway in mice part 5 long-term effect of intra nasal zinc sulfate irrigation on behavior biochemistry and morphology. *Brain Research*. 140(2): 271-286.
- No Oral** Harding, Joseph W., Getchell, Thomas V., and Margolis, Frank L. denervation of the primary olfactory pathway in mice . v. long-term effect of intranasal zinc sulfate irrigation on behavior , biochemistry and morphology. *Brain Res.* (1978) 140(2): 271-85.
- No COC** Harenza, T. and Jablonski, E. 1979. biological effect of bayo-n-ox, mecadox and a premix of zinc bacitracin, sulphamethazine and nitrofurazone. *Biologizace a Chemizace Zivocisne Vyroby - Veterinaria* 15(6): 509-514.
- No COC** Harenza, T., Nierodzik, A., Metelska, A., Pokora, K., Danik, B., and Malec, E. 1984. effect of antibiotic growth promoters on the performance of broilers. *Krmivarstvi a Sluzby* 20(1): 12-13.
- Unrel** Harenza, T., Urbanczyk, J., and Jendryka, J. 1979. biological effect of different bacitracin compounds in the rearing and preliminary fattening of pigs. *Biologizace a Chemizace Zivocisne Vyroby - Veterinaria* 15(5): 413-418.
- No Dose** Harker, D. B. 1974. serum immune globulin levels in artificially reared lambs. *Veterinary Record* 95(11): 229-231.
- CP** Harland B(A), Nmezi, D., Harris, D., Whitworth, H., Lloyd, H., Morris, E., and Hill, D. 1993. effects of phytate from beta fiber on rat femur strength and zinc content. *FASEB Journal* 7(3-4): A722.
- Abstract** Harland, B. F. 1974. dietary-protein source and tissue zinc in young japanese-quail. *Federation Proceedings* 33: 700.

- Abstract** Harland, B. F., Fox, M. R. S., and Fry, B. E. Jr. decreases in plasma zinc level due to fasting and dietary protein. *FED PROC. Federation Proceedings.* 30 (2). 1971 298
- CP** Harland, Barbara F., Fox, M. R. Spivey, and Fry, Bert E. Jr. changes in plasma zinc related to fasting and dietary protein intake of japanese quail. *Proc. Soc. Exp. Biol. Med.* (1974) 145(1): 316-22.
- Unrel** Harlyk, Charlotte, Nieto, Oscar, Bordin, Guy, and Rosa Rodriguez, Adela. electrochemical study of metallothioneins using cyclic voltammetry. *J. Electroanal. Chem.* (1998) 458(1-2): 199-208.
- No COC** Harmon, B. G., Jensen, A. H., and Baker, D. H. 1973. influence of dietary antibiotics on antibody response to specific antigens. *Journal of Animal Science.* 37(5): 1155-1158.
- FL** Harmuth-Hoene, A. E. and Meuser, F. bioavailability of zinc in whole meal cereal products with different phytate content. *Zeitschrift Fuer Ernahrungswissenschaft.* 26 (4). 1987. 250-267.
- FL** Harmuth-Hoene, A. E. and Meuser, F. biological availability of zinc in whole-grain cereal products with various phytate contents. *Z. Ernahrungswiss.* (1987) 26(4): 250-67.
- FL** Harran, E., Comelli Lia, R. C., Martin, E., and Benatti Neto, C. 1987. [analysis of variations in the consistency of zinc-oxide eugenol used as a sealer in pulpectomies. histomorphological study in dogs]. <original> analisis de la variacion de consistencia del oxido de cinc y eugenol utilizado como sellador en pulpectomias. estudio histomorfolgico en perros. *Revista Espanola De Endodoncia* 5(2): 31-9.
- CP** Harrington, M. and Flynn, A. 1993. the effect of dietary fibres on iron and zinc absorption in sucking rats. *Proceedings of the Nutrition Society* 52(1): 23A.
- Abstract** Harris, E. D. and Rayton, J. K. regulation of lysyl oxidase activity in-vitro with copper. *Federation Proceedings.* 37 (6). 1978 1425
- No COC** Harris, Janice E. hepatic glutathione, metallothionein and zinc in the rat on gestational day 19 during chronic ethanol administration. *J. Nutr.* (1990) 120(9): 1080-6.
- CP** HARRIS, L. and BOURNE, L. 1994. zinc distribution in the pregnant rat following acute doses of ethanol. *EXPERIMENTAL BIOLOGY* 94
- Alt** Harris-Warrick, R. M., Bothwell, M. A., and Shooter, E. M. subunit interactions inhibit the binding of beta nerve growth factor to receptors on embryonic chick sensory neurons. *Journal of Biological Chemistry.* 255 (23). 1980. 11284-11289.
- Diss** Harrison, Bertha M. Neal. 1986. the effect of excess dietary iron and ascorbic acid on zinc and copper storage and selected enzymes in guinea pigs. Avail.: Univ. Microfilms Int. Order No. DA8719760 From: Diss. Abstr. Int. B 1987, 48. 6. 1646. 187 pp.
- No Oral** HARSANYI, B. B., ANGELOPOULOS, A. P., and GOURLEY, J. M. sub cutaneous tissue response to composite resins in dogs. *ORAL SURG ORAL MED ORAL PATHOL*; 37 (2). 1974 308-319
- Fate** Hart, Beth A., Voss, George W., and Garvey, Justine S. metallothionein in rat lung during postnatal development. *Biol. Neonate* (1991) 59(4): 236-43 .
- FL** Hartel, J. and Kirchgessner, M. 1977. demonstration of zinc metalloenzyme syntheses in deprived animalszinc supplements by measurement of 65zn incorporation in individualorgans.

- No Oral** Hartel, J. and Kirchgessner, M. technique and dosages of zinc injections for metabolic efficiency studies. *Int. J. Vitam. Nutr. Res.* (1976) 46(4): 488-91.
- Alt** Hartiti, S., Lisbona, F., Lopez-Aliaga, I., Barrionuevo, M., Alferez, M. J. M., Pallares, I., Gomez-Ayala, A., and Campos, M. S. influence of dietary fat components and intestinal resection on iron, zinc and copper metabolism in rats. *Int. J. Vitam. Nutr. Res.* (1994) 64(4): 330-6 .
- Alt** Hartiti, S., Lopez-Aliaga, I., Barrionuevo, M., Lisbona, F., Pallares, I., Alferez, M. J. M., Gomez-Ayala, A. E., Campos, M. S., and Campos, M. S. zinc metabolism in rats : effects of intestinal resection, cholecalciferol and ascorbic acid. *Nutr. Res. (N. Y.)* (1994) 14(10): 1523-34 .
- Nut def** Hartmann, S. 1994. (effect of copper, iron, zinc and selenium deficiency on fatty acid composition of different tissues in pigs). <original> zum einfluss einer kupfer-eisen-, zink- und selen-depletion auf die fettsaeurezusammensetzung verschiedener gewebe beim schwein . 232 P.
- FL** Hartmann, S., Kirchgessner, M., and Eder, K. 1995. the effect of zinc deficiency on the osmotic fragility and fatty acidcomposition of erythrocytes in growing pigs. *Journal of Animal Physiology and Animal Nutrition* 73(4): 181-189.
- Wqual** Hartung, R. 1973. biological effects of heavy metal pollutants in water. *Adv Exp Med Biol.* 40: 161-72.
- Alt** Harvey, K. M. and Wang, M. 1984. the effect of zinc supplementation on growth in young uremic rats (food and nutrition). *Nutrition Research.* 4 (4): 647-655.
- Alt** Harvey, Kelly M. and Wang, Marian. 1984. the effect of zinc supplementation on growth in young uremic rats. *Nutr. Res. (N. Y.)* 4(4): 647-55 .
- Mix** Harvey, Phillip W., Hunsaker, Harry A., and Allen, Kenneth G. D. dietary l-histidine-induced hypercholesterolemia and hypocupremia in the rat. *J. Nutr.* (1981) 111(4): 639-47 .
- Nut def** Harvey, R. G., <Editors> Kelly, N. C., and Wills, J. M. 1996. nutrition and skin disorders. <book>manual of companion animal nutrition & feeding. 153-160.
- No COC** Harvey, R. W., Spears, J. W., and Darden, D. E. 1988. effects of lysocellin on performance, ruminal and plasmacharacteristics of growing cattle. *Journal of Animal Science* 66(4): 1036-1041.
- CP** Haryanto, B., Supriatna, D., Setiadi, B. W., Maha, I., <Editors> Djajanegara, A., and Sukmawati, A. 1994. growth response of sheep as affected by feeding zinc-methionine andless-degradable protein. <document title>sustainable animal production and the environment.proceedings of the 7th aaap animal science congress, bali, indonesia,11-16 july, 1994. volume 2: contributed papers. 475-476.
- FL** Haschke, F., Singer, P., Baumgartner, D., Steffan, I., Schilling, R., and Lothaller, H. 1985. growth, zinc and copper nutritional-status of male premature-infants with different zinc intake. *Annals Of Nutrition And Metabolism* 29(2): 95-102.
- Alt** Hase, Wakako, Seo, Byeong boo, Tojo, Hideaki, Tanaka, Satoshi, and Tachi, Chikashi. transgenic mice overexpressing foreign whey acidic protein (wap) genes driven by metallothionein promoter. *J. Reprod. Dev.* (1996) 42(4): 265-271.
- Nut def** Hasegawa, H. and Tomita, H. 1986. assessment of taste disorders in rats by simultaneous study

of the two-bottle preference test and abnormal ingestive behavior. *Auris, Nasus, Larynx* 13 Suppl 1: S33-41.

- In Vit** Hasegawa, T., Hagiwara, Y., Saito, K., and Ozawa, E. 1982. effect of transferrin on chick cell growth in-vitro and transferrin receptor. *15TH ANNUAL MEETING OF THE JAPANESE SOCIETY OF DEVELOPMENTAL BIOLOGISTS, TOKYO, MAY 27-29, 1982. DEV GROWTH DIFFER.* 29(4): 388.
- CP** Hashani, A. and Carlson, C. W. effect of zinc bacitracin and copper sulfate on growing turkeys. *69TH ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC. POULT SCI.* 59 (7). 1980. 1626.
- Phys** Hashemzadeh-Gargari, H. and Guilarte, Tomas R. divalent cations modulate n-methyl-d-aspartate receptor function at the glycine site. *J. Pharmacol. Exp. Ther.* (1999) 290(3): 1356-1362.
- Unrel** Hashimoto, K., Joseph, F. Jr., Falster, A. U., Simmons, W. B., and Nakamoto, T. effects of maternal caffeine intake during lactation on molar enamel surfaces in newborn rats. *Arch. Oral Biol.* (1992) 37(2): 105-9.
- Phys** Hashimoto, S., Maeda, M., Yamakita, J., and Nakamura, Y. 1990. effects of zinc oxide-eugenol on leucocyte number and lipoxygenase products in artificially inflamed rat dental pulp. *Archives of Oral Biology* 35(2): 87-93.
- In Vit** Hashizume Masayuki and Yamaguchi Masayoshi(A). 1994. effect of beta-alanyl-l-histidinato zinc on differentiation of osteoblastic mc3t3-e1 cells: increases in alkaline phosphatase activity and protein concentration. *Molecular and Cellular Biochemistry* 131(1): 19-24.
- BioX** Hass, M. A., Frank, L., and Massaro, D. 1982. the effect of bacterial endotoxin on synthesis of (cu,zn)superoxide dismutase in lungs of oxygen-exposed rats. *Journal of Biological Chemistry* 257(16): 9379-83.
- Phys** Hass, M. A., Iqbal, J., Clerch, L. B., Frank, L., and Massaro, D. rat lung copper zinc superoxide dismutase isolation and sequence of a full-length complementary dna and studies of enzyme induction. *Journal of Clinical Investigation.* 83 (4). 1989. 1241-1246.
- No Tox** Hass, M. A. and Massaro, D. developmental regulation of rat lung copper zinc-superoxide dismutase . *Biochemical Journal.* 246 (3). 1987. 697-704.
- Abstract** Hass, M. A. and Massaro, D. regulation of rat lung copper-zinc superoxide dismutase in developmental pattern of oxygen tolerance. *70TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 13-18, 1986. FED PROC.* 45 (4). 1986. 907.
- Nut def** Hassan, N. and Kamel, M. 1987. histochemical and electron-microscopic study of the effect of zincdeficient diet on the skin of albino rat. *Journal of the Egyptian Medical Association* 70(1-4): 35-46.
- Nut def** Hassan, Nadia and Kamel, Moustafa. histochemical and electron-microscopic study of the effect of zinc deficient diet on the skin of albino rat. *J. Egypt. Med. Assoc.* (1987) 70(1-4): 35-45.
- CP** Hassan, S. G., Nawito, M. F., Omaina, H. E., and Ahmed, W. M. 1994. mineral levels in blood of buffaloes during different reproductivestages in relation to feeding season. <Document Title>*Proceedings, 4th World Buffalo Congress, Sao Paulo,Brazil, 27-30 June, 1994. Volume 3.* 621-623.

- No COC** Hataba, N. A., Radwan, M. S. M., Ibrahim, S. A., and El-Faham, A. I. 1997. effect of antibiotics supplementation and type of diets on performance of broiler chicks during hot weather conditions. *Egyptian Poultry Science Journal* 17(2): 93-113 .
- IMM** Hatanaka, M., Seya, T., Yoden, A., Fukamoto, K., Semba, T., and Inai, S. analysis of c5b-8 binding sites in the c9 molecule using monoclonal antibodies participation of two separate epitopes of c9 in c5b-8 binding. *MOL IMMUNOL. Molecular Immunology.* 29 (7-8). 1992. 911-916.
- Nut** Hatch, P. A., Spears, J. W., Goode, L., and Johnson, B. H. 1987. influence of dietary zinc on growth and testicular development in ram lambs fed a high fiber diet. *Nutrition Reports International* 35(6): 1175-1183.
- Nut** Hatfield, F. G. C. K. Swenson R. W. Kott B. P. Ansotegui N. J. Roth and B. L. Robinson. 2001. zinc and copper status in ewes supplemented with sulfate and amino acid-complexed forms of zinc and copper. *Journal of Animal Science.* 79: 261-266.
- Abstract** Hatfield, P. G., Snowden, G. D., Head, W. A. Jr, Glimp, H. A., and Besser, T. 1993. the effects of zinc methionine and level of protein during late gestation and early lactation on ewes rearing either single or twin lambs. *Journal of Animal Science* 71(SUPPL. 1): 292.
- Mineral** Hatfield, P. G., Snowden, G. D., Head, W. A. Jr., Glimp, H. A., Stobart, R. H., and Besser, T. 1995. production by ewes rearing single or twin lambs: effects of dietary crude protein percentage and supplemental zinc methionine. *Journal of Animal Science* 73(5): 1227-1238.
- In Vit** Hatzopoulos, A. K., Folkman, J., Vasile, E., Eiselen, G. K., and Rosenberg, R. D. 1998. isolation and characterization of endothelial progenitor cells from mouse embryos. *Development* 125(8): 1457-68.
- CP** Hayakawa, F., Urabe, K., and Murata, K. effect of cellulose on serum zinc concentration of weanling rat fed normal level or high level of dietary zinc. *FIFTH ASIAN CONGRESS OF NUTRITION, OSAKA, JAPAN, OCTOBER 26-29, 1987. J NUTR SCI VITAMINOL.* 0 (Spec. Suppl.). 1988. 507.
- Nut** Hayakawa, Takashi, Nakamura, Kaoru, Takita, Toshichika, Innami, Satoshi, Yamada, Kohei, Yoshioka, Toshio, and Kawamura, Saburoh. influence of extrusion on the physiological effects of brans in rats. *Agric. Biol. Chem. (1990)* 54(5): 1285-7 .
- Nut def** Hayashi, E., Suzuki, K., Hirota, H., Yanagihara, R., Fujibayashi, K., Ohkubo, H., Ishizuka, H., Ono, Y., Arakawa, Y., and et al. metabolism of trace metals during liver regeneration in rats. *Biomed. Res. Trace Elem. (1993)* 4(2): 139-40.
- FL** Hayashi, Yasuhisa, Yabuta, Yoshiko, Shimizu, Yasuyuki, and Shimao, Shuhei. behavior of trace metals in leg lymph of rabbits : copper and zinc contents. *Igaku to Seibutsugaku (1982)* 105(6): 405-8 .
- Food** Hayes, Johnnie R., Wilson, Nelson H., Pence, Deborah H., and Williams, Kevin D. subchronic toxicity studies of salatrim structured triacylglycerols in rats . 3. triacylglycerols composed of stearate, acetate, propionate, and butyrate. *J. Agric. Food Chem. (1994)* 42(2): 552-62.
- Prim** Haynes, D. C., Gershwin, M. E., Golub, M. S., Cheung, A. T., Hurley, L. S., and Hendrickx, A. G. 1985. studies of marginal zinc deprivation in rhesus monkeys: vi. influence on the immunohematology of infants in the first year. *American Journal of Clinical Nutrition* 42(2): 252-62.

- Prim** Haynes, D. C., Gershwin, M. E., Golub, M. S., Cheung, A. T. W., Hurley, L. S., and Hendrickx, A. G. 1985. studies on marginal zinc deprivation in rhesus monkeys: 6. influence on the immunohematology of infants in the first year. *American Journal of Clinical Nutrition* 42(2): 252-263.
- Prim** Haynes, D. C., Golub, M. S., Gershwin, M. E., Cheung, A. T., Hurley, L. S., and Hendrickx, A. G. 1987. long-term marginal zinc deprivation in rhesus monkeys. i. effects on adult female breeders before conception. *American Journal of Clinical Nutrition* 45(6): 1492-502.
- Prim** Haynes, D. C., Golub, M. S., Gershwin, M. E., Hurley, L. S., and Hendrickx, A. G. 1987. long-term marginal zinc deprivation in rhesus monkeys. ii. effects on maternal health and fetal growth at midgestation. *American Journal of Clinical Nutrition* 45(6): 1503-13.
- Prim** Haynes, Darrell C., Gershwin, M. Eric, Golub, Mari S., Cheung, Anthony T. W., Hurley, Lucille S., and Hendrickx, Andrew G. studies of marginal zinc deprivation in rhesus monkeys : vi. influence on the immunohematology of infants in the first year. *Am. J. Clin. Nutr.* (1985) 42(2): 252-62.
- Prim** Haynes, Darrell C., Golub, Mari S., Gershwin, M. Eric, Cheung, Anthony T. W., Hurley, Lucille S., and Hendrickx, Andrew G. long-term marginal zinc deprivation in rhesus monkeys . i. effects on adult female breeders before conception. *Am. J. Clin. Nutr.* (1987) 45(6): 1492-502.
- Prim** Haynes, Darrell C., Golub, Mari S., Gershwin, M. Eric, Hurley, Lucille S., and Hendrickx, Andrew G. long-term marginal zinc deprivation in rhesus monkeys . ii. effects on maternal health and fetal growth at midgestation. *Am. J. Clin. Nutr.* (1987) 45(6): 1503-13.
- Alt** Hazan, A. and Yalcin, S. 1989. comparison of four methods of inducing moult in heavy breeders on subsequent egg production and hatchability. *Zootecnica International* (3): 38-41.
- No Oral** Hazelhoff Roelfzema, W., Roelofsen, A. M., Herber, R. F., Leene, W., and Copius Peereboom-Stegeman JH. 1987. effects of chronic cadmium administration on placental and fetal development. *Journal of Trace Elements and Electrolytes in Health and Disease* 1(1)
- No Oral** Hazelhoff Roelfzema, W., Roelofsen, A. M., Herber, R. F. M., Leene, W., and Copius Peereboom-Stegeman, J. H. J. 1987. effects of chronic cadmium administration on placental and fetal development. *J. Trace Elem. Electrolytes Health Dis.* 1(1): 49-53 .
- CP** Hazelhoff Roelfzema, W., Roelofsen, A. M., Peereboom-Stegeman, J. H. J. Copius, and Herber, R. F. M. 1987. zinc and cadmium concentrations in liver and placentas of rats : are they interrelated? *Trace Elem. Anal. Chem. Med. Biol. Proc. Int. Workshop, 4th* : Meeting Date 1986, 301-10. Editor(s): Braetter, Peter; Schramel, Peter. Publisher: de Gruyter, Berlin, Fed. Rep. Ger..
- Gene** He, C. Z. and Burch, J. B. 1997. the chicken gata-6 locus contains multiple control regions that confer distinct patterns of heart region-specific expression in transgenic mouse embryos. *Journal of Biological Chemistry* 272(45): 28550-6.
- FL** He, Liusheng, Yan, Xiaoshan, and Wu, Dechang. study on bioavailability of zinc using isotope zinc65. *Yingyang Xuebao* (1990) 12(4): 372-7 .
- FL** He Ting (Guangdong Academy of Agricultural Science, Guangzhou China Inst. of Animal Science. 1995 . a study on zn requirement for broiler. *Acta Zoonutrientia Sinica.* V. 7(1) P. 2-9
- Nut def** He, Zhen, Matsumoto, Masayasu, Cui, Li, Li, Ji-Yao, Ueda, Hirokazu, Oiki, Eiji, Takagi, Yoji, Okada, Akira, and Yanagihara, Takehiko. zinc-deficiency increases infarct size following

- permanent middle cerebral artery occlusion in rats. *Nutr. Res. (N. Y.)* (1997) 17(2): 305-316.
- Drug** Heath, A. C. G., Cole, D. J. W., Bishop, D. M., Pfeffer, A., Cooper, S. M., and Risdon, P. 1995. preliminary investigations into the aetiology and treatment of cockle, a sheep pelt defect. *Veterinary Parasitology* 56(1/3): 239-254.
- Nut def** Heaton, Frank W. comparative effects of magnesium and zinc deficiency on alkaline phosphatase isozymes. *Magnesium-Bull. (1981)* 3(2): 101-3.
- FL** Hecht, H. Bundesanstalt fuer Fleischforschung Kulmbach Germany Inst. fuer Chemie und Physik, Anke, M., Meissner, D., Bergmann, H., Bitsch, R., Dorn, W., Flachowsky, G., Groppel, B., Guertler, H., Lombeck, I., Luckas, B., Merbach, W., and Schneider, H. J. 1994. the long-time behaviour of metals in browse, muscles and organs of wild animals. <original> das langzeitverhalten von metallen in aesung, muskeln und organen von wildtieren. (deficits and surpluses on macro and trace elements in the nutrition). <original> defizite und ueberschuesse an mengen- und spurenelementen in der ernaehrung. P. 686-693
- FL** Hedemann, M. S. Danish Institute of Agricultural Sciences Tjele Danemark Department of Animal Nutrition and Physiology, Gabert, V. M., and Larsen, T. 1998. pancreatic secretion of zinc and carboxypeptidase a and b in growing pigs. <original> secretion pancreatique de zinc et carboxypeptidases a et b chez le porc en croissance. *Reproduction Nutrition Development*. V. 38(4) P. 391-400
- Nut** Hedges, J. D., Kornegay, E. T., and Thomas, H. R. 1976. comparison of dietary zinc levels for reproducing sows and the effect of dietary zinc and calcium on the subsequent performance of their progeny. *Journal of Animal Science* 43(2): 453-463.
- Abstract** Hedges, J. D., Thomas, H. R., and Kornegay, E. T. dietary zinc levels for reproducing sows during 5 parities. *Virginia Journal of Science*. 26 (2). 1975 42
- Abstract** Hedges, J. D., Thomas, H. R., and Kornegay, E. T. effect of dietary zinc and calcium on progeny of sows fed 2 dietary zinc levels. *Journal of Animal Science*. 41 (1). 1975 315-316
- Abstract** Hedges, J. D., Thomas, H. R., and Kornegay, E. T. influence of previous sow zinc nutrition upon feedlot performance and serum and hair mineral content of progeny fed 2 dietary zinc and calcium levels. *Virginia Journal of Science*. 26 (2). 1975 42
- Abstract** Hefferan, T. E., Sherman, S. S., Sinha, R., Kerr, J. M., Smith, J. C., and Soares, J. H. Jr. dietary zinc vitamin d source and fasting effects on calcium homeostasis in the rat. *70TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 13-18, 1986. FED PROC.* 45 (4). 1986. 1082.
- Nut** Hegazy, S. M. and Adachi, Y. 2000. comparison of the effects of dietary selenium, zinc, and selenium and zinc supplementation on growth and immune response between chick groups that were inoculated with salmonella and aflatoxin or salmonella. *Poultry Science* 79(3): 331-5.
- CP** Hegedus, M., Szabo, J., Szigeti, G., Bruckner, G., Kosa, E., and Andrasofszky, E. 1998. zinc oxide increases pancreatic and intestinal hydrolase activity in rats. *FASEB Journal* 12(4): A220.
- CP** Heidecker, H. A. and Borgman, R. F. 1982. zinc and chromium metabolism as affected by dietary carbohydrates in rabbits. *Federation Proceedings* 41: 395.
- Abstract** Heidecker, H. A. and Borgman, R. F. zinc and chromium metabolism by dietary carbohydrates in rabbits. *66TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR*

- No COC** Heidecker, H. A., Borgman, R. F., and Maurice, D. V. 1985. influence of dietary carbohydrates upon the metabolism of lipids and minerals in rabbits. *Nutrition Research* 5(9): 983-992.
- FL** Heindl, U. 1993. [investigations on varying zinc supply and the application of recombinant bovine growth hormone on selected performance and blood parameters in calves]. <original> untersuchungen zur unterschiedlichen zinkversorgung und applikation von rekombinantem bovinem wachstumshormon auf ausgewaehlte leistungs- und blutparameter bei kaelbern. 150 P.
- FL** Heindl, U. Technische Univ. Muenchen Freising Germany Inst. fuer Ernaehrungsphysiologie and Kirchgessner, M. 1993. effects of zinc deficiency and application of exogen recombinant bovine growth hormone on performance and parameter of zinc status of calves. <original> auswirkungen von zinkmangel und der applikation von rekombinantem bovinem wachstumshormon auf leistungsmerkmale und parameter des zinkstatus bei aufzucht- und mastkaelbern. *Journal of Animal Physiology and Animal Nutrition*. V. 70(2) P. 61-71
- CP** Heindl, U. Technische Univ. Muenchen Freising Germany Inst. fuer Ernaehrungsphysiologie, Kirchgessner, M., and Gieseke, D. ed. 1994. studies of different zinc supply and application of exogen recombinant bovine growth hormone on performance and parameter of blood of calves. <original> untersuchungen zur unterschiedlichen zinkversorgung und applikation von rekombinantem bovinem wachstumshormon auf ausgewaehlte leistungs- und blutparameter bei kaelbern. proceedings of the society of nutrition physiology. <original> berichte der gesellschaft fuer ernahrungsphysiologie. P. 88. No. 2
- FL** Heindl, U. Technische Univ. Muenchen Freising Germany Inst. fuer Ernaehrungsphysiologie, Kirchgessner, M., and Schams, D. 1993. the effect of zinc deficiency and application of recombinant bovine growth hormone on plasma growth hormone and insulin like growth factor-1 of calves. <original> auswirkungen von zinkmangel und der applikation von rekombinantem bovinem wachstumshormon auf wachstumshormon und igf-1 im plasma von kaelbern. *Journal of Animal Physiology and Animal Nutrition*. V. 70(3) P. 149-158
- Diss** Heinrich, Myra Dene. 1980. the effects of prenatal and postnatal zinc deficiency on development of long-term memory in the rat. Avail.: Univ. Microfilms Int. Order No. 8020378 From: Diss. Abstr. Int. B 1980, 41. 3. 1151. 135 pp.
- Drug** Heinrichs, A. J., Todhunter, D. A., Murray, F. A., Grifo, A. P. Jr., Harrison, J. H., and Conrad, H. R. 1984. zinc-methionine supplementation for dairy cows - a study of effects on plasma zinc, wound healing, mammary health, and immune responses. <document title>research circular, ohio agricultural research and development center. (281): 12pp.
- Alt** Heinzl, W. E., Kirchgessner, M., and Roth H-P. experimental studies on zinc metabolism in rats with streptozotocin-induced diabetes mellitus. *Trace Elements in Medicine*. 4 (4). 1987. 144-148.
- No COC** Heitmann, K. G., Bogan, P. L., Brown, K. E., Frierson, H. F., and Turk, D. E. effect of ingested poly chlorinated bi phenyl aroclor 1242 on growth calcium and zinc absorption cellular respiration rate and ultrastructure in chicks. *Bulletin of the South Carolina Academy of Science*. 35. 1973 (Recd 1974) 135
- Nut def** Held, D. D. and Hoekstra, W. G. 1984. the effects of zinc deficiency on turnover of cadmium-metallothionein in rat liver. *The Journal Of Nutrition*. 114(12): 2274-2282.
- No Oral** Held, Douglas D. and Hoekstra, William G. the effects of zinc deficiency on turnover of

cadmium-metallothionein in rat liver. *J. Nutr.* (1984) 114(12): 2274-82 .

- Alt** Heller, W., Domres, B., Hacker, W., and Oehler, U. the behavior of sodium, potassium, magnesium and zinc in the brain with special attention to cerebral edema following experimentally induced burns. *Adv. Neurosurg.* (1982) 10(Comput. Tomogr., Brain Metab., Spinal Inj.): 236-43.
- Nut def** Helwig, L. R. Jr., Mulnix, E. J., and Regenstein, J. M. effects of varied zinc/copper ratios on egg and plasma cholesterol level in white leghorn hens. *J. Food Sci.* (1978) 43(3): 666-9 .
- Unrel** Hemming, J. E. and Cocklan-Vendl, M. 1992. *Regulatory Processes Associated With Metal-Mine Development in Alaska: A Case Study of the Red Dog Mine.* <NOTE> Open File Rept. BUMINES-OFR-93-92
- Mineral** Hempe, J. M. and Cousins, R. J. 1989. effect of edta and zinc-methionine complex on zinc absorption by rat intestine. *The Journal Of Nutrition.* 119(8): 1179-1187.
- CP** Hempe, J. M. and Cousins, R. J. inverse relationship cysteine-rich intestinal protein and intestinal metallothionein in zinc absorption by rats. 1992 *MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY (FASEB), PART I, ANAHEIM, CALIFORNIA, USA, APRIL 5-9, 1992. FASEB (FED AM SOC EXP BIOL) J.* 6 (4). 1992. A1087.
- No Control** Hempe, James M. and Cousins, Robert J. cysteine-rich intestinal protein and intestinal metallothionein: an inverse relationship as a conceptual model for zinc absorption in rats. *J. Nutr.* (1992) 122(1): 89-95 .
- Nut** Hempe, James M. and Cousins, Robert J. cysteine-rich intestinal protein binds zinc during transmucosal zinc transport. *Proc. Natl. Acad. Sci. U. S. A.* (1991) 88(21): 9671-4.
- Nut** Hempe, James M. and Savage, J. E. autoclaved egg whites as a protein source for chick diets low in zinc. *Poult. Sci.* (1990) 69(6): 959-65.
- Rev** Henderson, B. 1983. the application of quantitative cytochemistry to the study of diseases of the connective tissues. *Progress in Histochemistry and Cytochemistry* 15(1): 1-83 .
- Unrel** Henderson, G. I., Hoyumpa, A. M. Jr, McClain, C., and Schenker, S. 1979. the effects of chronic and acute alcohol administration on fetal development in the rat. *Alcoholism, Clinical and Experimental Research* 3(2): 99-106.
- Unrel** Henderson James R, Macalma Teresita, Brown Doris, Richardson James A, Olson Eric N, and Beckerle Mary C(A). 1999. the lim protein, crp1, is a smooth muscle marker. *Developmental Dynamics* 214(3): 229-238.
- Nut def** Henderson, Jayne Maria and Johnson, Mary Ann. changes in copper and iron utilization in copper-deficient rats fed fructose, sucrose or cornstarch. *Nutr. Rep. Int.* (1989) 40(1): 207-17.
- Nut def** Hendricks, D. G. and Mahoney, A. W. glucose tolerance in zinc-deficient rats. *J. Nutr.* (1972) 102(8): 1079-84.
- Nut def** Hendricks, K. M. and Walker, W. A. 1988. zinc-deficiency in inflammatory bowel-disease. *Nutrition Reviews* 46(12): 401-408.
- CP** HENDRICKS-MUNOZ, K. D., CLERCH, L., and MASSARO, D. 1989-1990. effects of endotoxin and hyperoxia on rat type ii pneumocyte copper zinc superoxide dismutase. *JOINT*

MEETING OF THE AMERICAN PEDIATRIC SOCIETY AND THE SOCIETY FOR PEDIATRIC RESEARCH

- Unrel** Hendry, J. A., Jeansonne, B. G., Dummett, C. O. Jr, and Burrell, W. 1982. comparison of calcium hydroxide and zinc oxide and eugenol pulpectomies in primary teeth of dogs. *Oral Surgery, Oral Medicine, and Oral Pathology* 54(4): 445-51.
- Nut def** Heng, H., Rucker, R. B., Crotty, J., and Dubick, M. A. the effects of ozone on lung heart and liver superoxide dismutase and glutathione peroxidase activities in the protein-deficient rat. *Toxicology Letters (Amsterdam)*. 38 (3). 1987. 225-238.
- No Oral** Heng, Ming K., Song, Moon K., and Heng, M. C. Y. reciprocity between tissue calmodulin and camp levels: modulation by excess zinc. *Br. J. Dermatol. (1993)* 129(3): 280-5.
- CP** Henkin, R. I. 1978. zinc dependent control of food intake, taste and smell function. *Trace Elem. Metab. Man Anim. Proc. Int. Symp., 3rd* : Meeting Date 1977, 190-8. Editor(s): Kirchgessner, M. Publisher: Arbeitskreis Tierernaehrungsforschung Weihenstephan Inst. Ernaehrungsphysiol., Freising-Weihenstephan, Ger..
- CP** Henkin, R. I. and Aamodt, R. L. 1983. a redefinition of zinc-deficiency. *Acs Symposium Series* 210: 83-105.
- BioX** Henkle-Duehrsen Kimberly(A), Warnecke Caren, Brattig Norbert, Liebau Eva, and Walter Rolf D. 1994. characterization of enzymatically active onchocera volvulus cu/zn superoxide dismutase expressed in escherichia coli. *Molecular and Biochemical Parasitology* 67(1): 41-47.
- Dead** Hennig, I., Zentek, J., and Waldmann, K. H. 1999. outbreak of parakeratosis in pigs on an organic farm. *Praktische Tierarzt* 80(2): 131-134.
- Phys** Henning Susan J, Oesterreicher Thomas J, Osterholm Doreen E, Lottaz Daniel, Hahn Dagmar, and Sterchi Erwin E(A). 1999. meprin mrna in rat intestine during normal and glucocorticoid-induced maturation: divergent patterns of expression of alpha and beta subunits. *FEBS Letters* 462(3): 368-372.
- Rev** Henrotte, J. G. 1986. type a behavior and magnesium metabolism. *Magnesium* 5(3-4): 201-10.
- Bio Acc** Henrotte, J. G., Santarromana, M., and Bourdon, R. 1985. plasma and red blood-cell magnesium, calcium and zinc concentrations in spontaneously hypertensive rats. *Comptes Rendus De L Academie Des Sciences Serie Iii-Sciences De La Vie* 300(11): 431&.
- Alt** Henrotte, Jean G., Santarromana, Monique, Franck, Gisele, Guicheney, Pascale, Boulu, Roger, and Bourdon, Raymond. high cardiac zinc levels in spontaneously hypertensive rats. *J. Hypertens. (1992)* 10(6): 553-9 .
- Drug** Henry, P. R., Ammerman, C. B., Campbell, D. R., and Miles, R. D. 1987. effect of antibiotics on tissue trace mineral concentration and intestinal tract weight of broiler chicks. *Poult. Sci.* 66(6): 1014-18 .
- CP** Henry, P. R., Ammerman, C. B., and Miles, R. D. effect of time and dietary zinc on tissue uptake of zinc in chicks. *TENTH ANNUAL MEETING OF THE SOUTHERN POULTRY SCIENCE SOCIETY. POULT SCI.* 68 (Suppl.). 1989. 185.
- No COC** Herberg, J. A., Beck, S., and Trowsdale, J. 1998. tapasin, daxx, rgl2, hke2 and four new genes (bing 1, 3 to 5) form a dense cluster at the centromeric end of the mhc. *Journal of Molecular*

Biology 277(4): 839-57.

- Unrel** Herberg, L. J., Rose, I. C., Davison, F., Thom, M., Beckett, A., and Scaravilli, F. 1997. spontaneous epileptiform seizures but increased resistance to kindled seizures in a mutant sprague-dawley rat (mf/mf). *Pharmacology, Biochemistry, and Behavior* 58(4): 993-1001.
- Surv** Herbert, G. B. and Peterle, T. J. heavy metal and organochlorine compound concentrations in tissues of raccoons from east-central michigan. *Bull. Environ. Contam. Toxicol.* (1990) 44(2): 331-8 .
- In Vit** Herington, A. C. 1985. effect of zinc on the binding and action of growth-hormone in isolated rat adipocytes. *Biochemistry International* 11(6): 853-862.
- In Vit** Herington, Adrian C. effect of zinc on the binding and action of growth hormone in isolated rat adipocytes. *Biochem. Int.* (1985) 11(6): 853-62 .
- Nut def** Herman, Z., Greeley, S., and King, J. C. 1985. placenta and maternal effects of marginal zinc deficiency during gestation in rats. *Nutrition Research*. 5(2): 211-219.
- Nut def** Herman, Zareb, Greeley, Sharon, and King, Janet C. placenta and maternal effects of marginal zinc deficiency during gestation in rats. *Nutr. Res. (N. Y.)* (1985) 5(2): 211-19.
- Mix** Hermann, J. C. Goad A. Arquitt B. Stoecker R. Porter and P. L. Claypool. effects of dietary chromium, copper and zinc on plasma lipid concentrations in male japanese quail. *Nutr. Res. (N. Y.)* (1998) 18(6): 1017-1027 .
- Mix** Hermann, Janice, Goad, Carla, Stoecker, Barbara, Arquitt, Andrea, Porter, Rebecca, Adeleye, Bernice, Claypool, P. L., and Brusewitz, Gerald. effects of dietary chromium, copper and zinc on femur fracture force and femur calcium concentration in male japanese quail. *Nutr. Res. (N. Y.)* (1997) 17(10): 1529-1540 .
- Unrel** Hermansen, J. E., Larsen, T., and Andersen, J. O. 1995. does zinc play a role in the resistance of milk to spontaneous lipolysis? *International Dairy Journal* 5(5): 473-481.
- No COC** Hermansky, S. J., Stohs, S. J., Eldeen, Z. M., Roche, V. F., and Mereish, K. A. evaluation of potential chemoprotectants against microcystin-lr hepatotoxicity in mice. *J. Appl. Toxicol.* (1991) 11(1): 65-74.
- Abstract** Hermayer, K. L., Stake, P. E., and Shippe, R. L. 1977. evaluation of dietary zinc, cadmium, tin, lead, bismuth and arsenic toxicity in hens. *Poult. Sci.* 56(5): 1721-1722.
- Surv** Hernandez, L. M., Gonzalez, M. J., and Fernandez, M. A. 1988. organochlorines and metals in spanish imperial eagle eggs 1986-87. *ENVIRON CONSERV.* 15(4): 363-364.
- Bio Acc** Hernandez, L. M., Gonzalez, M. J., Rico, M. C., Fernandez, M. A., and Aranda, A. 1988. organochlorine and heavy metal residues in falconiform and ciconiform eggs spain. *BULL ENVIRON CONTAM TOXICOL.* 40(1): p86-93.
- Bio Acc** Hernandez, L. M. Inst of Organic Chemistry Spain, Gonzalez, M. J., Rico, M. C., Fernandez, M. A., and Baluja, G. presence and biomagnification of organochlorine pollutants and heavy. *J Environ Sci Health-Pestic Food Contam Agric Wastes.* V20, N6, P633(18)
- Yeast** Hernandez Saavedra, N. Y. and Ochoa, J. L. 1999. copper-zinc superoxide dismutase from the marine yeast *debaryomyces hansenii*. *Vol. 15, No. 8, Pp. 657-668* Yeast

- CP** Herndon, B., Suvarna, P., and Bamberger, D. 1993. zinc concentrations and the mechanism of zinc related effects on bacterial growth and bacterial killing by cefazolin within staphylococcal abscesses. *Journal of Immunology* 150(8 PART 2): 214A.
- In Vit** Herrmann, T. R. and Shamoo, A. E. 1983. ionophorous properties of the 13 000-da fragment from sarcoplasmic reticulum (ca²⁺ + mg²⁺)-atpase. *Biochimica Et Biophysica Acta* 732(3): 647-50.
- Anat** Herron Paul(A), Zhang Lu, Li Zhicheng, and Schweitzer John B. 1997. effects of cholinergic depletion on glutamic acid decarboxylase immunoreactivity in the somatosensory cortex of rats. *Anatomy and Embryology* 196(1): 27-38.
- Nut** Hervieu, J. 1992. at grignon: a complete diet based on compressed ensiled sugar beetpulp. *Chevre* (192): 28-29.
- Nut def** Herzfeld, Gudrun A., Reynolds, Leslie A., and Ritchey, S. J. zinc in maternal and fetal tissues of rats fed two levels of zinc during gestation. *Nutr. Rep. Int.* (1985) 31(4): 849-56.
- Gene** Herzog, A., Hohn, H., and Rieck, G. W. survey of recent situation of chromosome pathology in different breeds of german cattle. *Annales De Genetique Et De Selection Animale.* 9 (4). 1977 (Recd 1978) 471-491
- FL** Herzog, A. and Volmer, K. Doll G. 1983. a disorder of the hair coat of roe deer (capreoluscapreolus)--parakeratosis. *Berliner Und Munchener Tierarztliche Wochenschrift* 96(1): 17-23.
- Abstract** Hesketh, J. zinc binding to tubulin and stimulation of micro tubule assembly. *1ST EUROPEAN CONGRESS ON CELL BIOLOGY, PARIS, JULY 18-23, 1982. BIOL CELL.* 45 (2). 1982. 259.
- Nut def** Hesketh, J. E. 1982. effects of dietary zinc deficiency on leydig cell ultrastructure in theboar. *Journal of Comparative Pathology* 92(2): 239-247.
- CP** Hess, R. L. and Gordon, D. T. 1985. influence of zinc on diarrhea caused by a heated casein-starch diet in the rat. *Federation Proceedings* 44: 932.
- No COC** Hester, A. S. international minerals and chemical plans to commercialize recombinant swine growth hormone. *Genetic Technology News.* 6 (8). 1986. 1.
- CP** Hevia Patricio, Liuzzi Juan P, and Cioccia Anna M. 1998. micronutrient intestinal balance in growing rats with lactose-induced diarrhoea. *Proceedings of the Nutrition Society* 57(1): 70A.
- Nut def** Hewedy, F. M., Murphy, C., and Cremin, F. M. effect of zinc deficiency on folate absorption in rats. *Food Chem.* (1991) 41(1): 93-8.
- Prim** Heys, D. R., Heys, R. J., Cox, C. F., and Avery, J. K. 1976. histopathologic evaluation of the effects of four calcium hydroxide liners on monkey pulps. *Journal of Oral Pathology* 5(3): 129-48.
- Unrel** Heys, R. J. and Fitzgerald, M. 1991. microleakage of three cement bases. *Journal of Dental Research* 70(1): 55-8.
- Nut def** HICKORY, W. B., NANDA, R., and CATALANOTTO, F. A. fetal skeletal malformations associated with zinc deficiency during pregnancy. *J DENT RES* 56:B204,1977
- Nut def** Hickory, Wayne, Nanda, Ravindra, and Catalanotto, Frank A. fetal skeletal malformations

	associated with moderate zinc deficiency during pregnancy. <i>J. Nutr.</i> (1979) 109(5): 883-91.
Nut def	Hicks, Sonja E. and Wallwork, James C. effect of dietary zinc deficiency on protein synthesis in cell-free systems isolated from rat liver. <i>J. Nutr.</i> (1987) 117(7): 1234-40.
Unrel	Hidaka, Hidekuni. effect of zinc on halothane-induced liver injury in rats. <i>Okayama Igakkai Zasshi</i> (1994) 106(9/10): 1073-84.
Rev	Hidalgo, Juan, Gasull, Teresa, Giralt, Mercedes, and Armario, Antonio. brain metallothionein in stress. <i>Biol. Signals</i> (1994) 3(4): 198-210 .
Bio Acc	Hidiroglou, M., Morris, G., and Ivan, M. 1982. chemical composition of sheep bones as influenced by molybdenum supplementation. <i>Journal of Dairy Science</i> 65(4): 619-624.
Rev	Hidiroglou, M. and Williams, C. J. 1986. mineral and amino acid composition of beef cattle hooves. <i>American Journal of Veterinary Research</i> 47(2): 301-303.
Fate	Hietanen, Eino, Aitio, Antero, Koivusaari, Ulla, Kilpio, Jukka, Nevalainen, Timo, Narhi, Matti, Savolainen, Heikki, and Vainio, Harri. 1982. tissue concentrations and interaction of zinc with lead toxicity in rabbits. <i>Toxicology</i> 25(2-3): 113-27 .
No COC	Hietanen, Eino, Kilpio, Jukka, Koivusaari, Ulla, Nevalainen, Timo, Narhi, Matti, Savolainen, Heikki, and Vainio, Harri. neurotoxicity of lead in rabbits. <i>Dev. Toxicol. Environ. Sci.</i> (1980) 8(Mech. Toxic. Hazard Eval.): 67-70.
Unrel	Higami, A. 1999. occurrence of white line disease in performance horses fed on low-zinc and low-copper diets. <i>Journal of Equine Science</i> 10(1): 1-5.
Alt	Higashi, Y., Moribe, H., Takagi, T., Sekido, Ryohei, Kawakami, K., Kikutani, H., and Kondoh, H. 19970400. impairment of t cell development in delta ef1 mutant mice. <i>Vol. 185, No. 8, Pp. 1467-1479 J. Exp. Med.</i>
In Vit	Higuchi, K. 1969. <i>An Improved Chemically Defined Culture Medium for Strain L Mouse Cells Based on Growth Responses to Graded Levels of Nutrients. SMUFD-TECHNICAL MANUSCRIPT-563</i>
In Vit	Higuchi, K. 1969. <i>An Improved Chemically Defined Culture Medium for Strain L Mouse Cells Based on Growth Responses to Graded Levels of Nutrients Including Iron and Zinc Ions : 8p.</i>
No COC	Higuchi, S. 1981. vole control by rodenticides in afforested land. <i>Rev. Plant Prot. Res.</i> 14: 169-186.
In Vit	Hildebrand, C. E. and Enger, M. D. regulation of cadmium zinc stimulated metallo thionein synthesis during induction de induction and super induction. <i>Biochemistry.</i> 19 (25). 1980 (Recd 1981). 5859-5857.
IMM	Hildebrandt, K. M., Luecke, R. W., and Fraker, P. J. 1982. effects of maternal dietary zinc on growth and mitogenic responsiveness in suckling mice (immune development). <i>The Journal Of Nutrition.</i> 112 (10): 1921-1928.
IMM	Hildebrandt, Kim M., Luecke, Richard W., and Fraker, Pamela J. effects of maternal dietary zinc on growth and mitogenic responsiveness in suckling mice . <i>J. Nutr.</i> (1982) 112(10): 1921-8 .
Acu	Hilderman, E. and Taylor, P. A. 1974. acute pulmonary emphysema in cattle exposed to zinc

oxide fumes. *Canadian Veterinary Journal* 15(No.6): 173-175.

- Rev** Hill, C. H. 1979. dietary influences on resistance to salmonella infection in chicks. *Federation Proceedings* 38(7): 2129-33.
- CP** Hill, C. H. the interaction of salmonella-gallinarum infection and zinc metabolism in chicks. *70TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 13-18, 1986. FED PROC.* 45 (4). 1986. 975.
- HHE** Hill, C. H. interactions among trace elements. PRASAD, A. S. (ED.). *CURRENT TOPICS IN NUTRITION AND DISEASE, VOL. 18. ESSENTIAL AND TOXIC TRACE ELEMENTS IN HUMAN HEALTH AND DISEASE; FIRST INTERNATIONAL MEETING OF THE INTERNATIONAL SOCIETY FOR TRACE ELEMENT RESEARCH IN HUMANS, PALM SPRINGS, CALIFORNIA, USA, DECEMBER 8-12, 1986. XXIII+679P. ALAN R. LISS, INC.: NEW YORK, NEW YORK, USA. ILLUS. ISBN 0-8451-1617-7. 0 (0). 1988. 491-500.*
- CP** HILL, C. H. 1985. interactions of copper and mercury with vanadate in the chick. *69TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY*
- Rev** Hill, C. H. 1975. interrelationships of selenium with other trace elements. *Fed. Proc.* 34(11): 2096-2100.
- Rev** Hill, C. H. and Matrone, G. 1970. chemical parameters in the study of in vivo and in vitro interactions of transition elements. *Federation Proceedings.* 29(4): 1474-81.
- Mix** Hill, D. A., Peo, E. R. Jr., and Lewis, A. J. 1987. effect of zinc source and picolinic acid on pig performance and zinc balance in rats. *Nutr. Rep. Int.* 35(5): 107-14 .
- No COC** Hill, D. A., Peo, E. R. Jr., and Lewis, A. J. 1987. influence of picolinic acid on the uptake of 65zinc-amino acid complexes by the everted rat gut. *Journal Of Animal Science.* 65(1): 173-178.
- Mineral** Hill, D. A., Peo, E. R. Jr., Lewis, A. J., and Crenshaw, J. D. 1986. zinc-amino acid complexes for swine. *Journal of Animal Science* 63(1): 121-130.
- In Vit** Hill, Dale A., Peo, Ernest R. Jr., and Lewis, Austin J. effect of zinc source and picolinic acid on zinc-65 uptake in an in vitro continuous-flow perfusion system for pig and poultry intestinal segments. *J. Nutr. (1987)* 117(10): 1704-7.
- Unrel** Hill E F and Carpenter J W. 1982. responses of siberian ferrets to secondary zinc phosphide poisoning. *JOURNAL OF WILDLIFE MANAGEMENT* 46. 119(3): 678-685, illustr.
- No COC** Hill, E. F. and Carpenter J. W. 1982. responses of siberian ferrets to secondary zinc phosphide poisoning. *J.Wildl.Manag.* 46(3): 678-685.
- Acu** Hill, E. F. Heath R. G. Spann J. W. and Williams J. D. 1975. lethal dietary toxicities of environmental pollutants to birds. *U.S.Fish and Wildlife Service, Special Scientific Report-Wildlife.* 191: 1-61.
- Diss** Hill, G. M. 1982. effect of zinc on the growth, development and reproduction of gilts. *Dissertation Abstracts International, B* 42(8): 3043.
- Abstract** Hill, G. M., Carter, S. D., Ewan, R. C., Mahan, D. C., Miller, P. S., Shurson, G. C., and Veum, T.

L. 1999. titration of pharmacological doses of zinc in the nursery pig. *Journal of Animal Science* 77(SUPPL. 1): 177.

- Abstract** Hill, G. M., Cromwell, G. L., Crenshaw, T. D., Ewan, R. C., Knabe, D. A., Lewis, A. J., Mahan, D. C., Shurson, G. C., Southern, L. L., and Veum, T. L. 1996. impact of pharmacological intakes of zinc and (or) copper on performance of weanling pigs. *Journal of Animal Science* 74(SUPPL. 1): 181.
- Abstract** Hill, G. M., Ku, P. K., Miller, E. R., and Stowe, H. D. 1980. effect of dietary zinc on mineral concentrations in milk of first parity gilts. *Journal of Animal Science* 51(Suppl. 1): 202.
- Nut def** Hill, G. M., Ku, P. K., Miller, E. R., Ullrey, D. E., Losty, T. A., and O'dell, B. L. a copper deficiency in neo natal pigs induced by a high zinc maternal diet. *Journal of Nutrition*. 113 (4). 1983. 867-872.
- CP** Hill, G. M., Ku, P. K., Whetter, P. A., and Miller, E. R. effect of dietary zinc on mineral concentrations in milk of 2nd parity sows. *MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE, SOUTHERN SECTION, ATLANTA, GA., USA, FEB. 1-4, 1981. J ANIM SCI*. 53 (Suppl. 1). 1981 (Recd. 1982). 97-98.
- Drug** Hill, G. M., Link, J. E., Meyer, L., and Fritsche, K. L. 1999. effect of vitamin e and selenium on iron utilization in neonatal pigs. *Journal of Animal Science* 77(7): 1762-1768.
- Abstract** Hill, G. M., Miller, E. R., Bebiak, D. M., and Parsons, M. J. 1980. effect of dietary zinc levels on growth, feed efficiency, and serumzinc, copper and alkaline phosphatase of growing-developing gilts. *Journal of Animal Science* 51(Suppl. 1): 82.
- Abstract** Hill, G. M(A), Link, J. E., Meyer, L. J., Luebbering, L., and Vanskike, L. R. 1994. influence of neonatal fe on cu, zn and growth in the young pig. *Journal of Animal Science* 72(SUPPL. 2): 63.
- No Oral** Hill, Gretchen M., Brewer, George J., Hogikyan, Norman D., and Stellini, Michael A. 1984. the effect of depot parenteral zinc on copper metabolism in the rat. *J. Nutr.* 114(12): 2283-91 .
- Rev** Hill, R. 1977. copper toxicity ii. *Br Vet J*. 133(4): 365-73.
- Rev** HILL, R. 135(1) 1-16. a review of the 'toxic' effects of rapeseed meals with observations on meal from improved varieties. *BR. VET. J*. 1979
- BioAcc** Hill R, Leighton M, Heys V, and Jones D M. the accumulation of copper, zinc, manganese and iron in the foetus of deer. *TRACE ELEMENTS IN MAN AND ANIMALS* 6 1988. 128: 617-618, illustr.
- Bio Acc** Hill, R. and Walker, D. M. 1985. the retention of 59fe and 65zn by preruminant lambs givenmilk-substitutes based on either casein or soya-bean-protein isolate. *British Journal of Nutrition* 53(3): 587-593.
- Fate** Hill, R. and Walker, D. M. the retention of iron-59 and zinc-65 by preruminant lambs given milk substitutes based on casein or soybean protein isolate. *British Journal of Nutrition*. 53 (3). 1985. 587-594.
- Mix** Hill, R. Royal Vet. Coll. London Univ. Boltons Park Potters Bar Herts UK, Smith, I. M., and Leech, F. B. 1977. the effect of dietary supplements of copper, zinc and iron sulphates alone or with a chelator on survival in experimental fowl typhoid in the chick. *Avian Pathology*. V. 6(4) P. 425-434

- No COC** Hiltunen Timo, Luoma Jukka, Nikkari Tapio, and Yla-Herttuala Seppo(A). 1995. induction of 15-lipoxygenase mrna and protein in early atherosclerotic lesions. *Circulation* 92(11): 3297-3303.
- No Oral** HINCK-KNEIP, C. and ALSEN-HINRICHS, C. influences of gold on zinc, copper and metallothionein kinetics in liver and kidney of the rat. *HUMAN & EXPERIMENTAL TOXICOLOGY*; 15 (6). 1996. 518-522.
- No COC** Hines, T. and Dimmick R. W. 1971. the acceptance by bobwhite quail of rodent baits dyed and treated with zinc phosphide. *Proc.Ann.Conf.S.E.Assoc.Game Fish Comm.* 24: 201-205.
- Sludge** Hinesly, T. D., Hansen, L. G., and Bray, D. J. *Use of Sewage Sludge on Agricultural and Disturbed Lands. Report (1984)*
- Nut def** Hing, S. A. and Lei, K. Y. 1991. copper deficiency and hyperlipoproteinemia induced by a tetramine cupruritic agent in rabbits. *Biological Trace Element Research* 28(3): 195-211.
- HHE** Hinks, L. J., Clayton, B. E., and Lloyd, R. S. 1983. zinc and copper concentrations in leukocytes and erythrocytes in healthy-adults and the effect of oral-contraceptives. *Journal Of Clinical Pathology* 36(9): 1016-1021.
- FL** HINOIDE, M. histopathological studies of periodontal tissue reactions after furcation perforations treated with various inorganic biomaterials in dogs teeth. *SHIKWA GAKUHO*; 85 (5). 1985. 571-611.
- BioX** Hinshaw, V. S., Olsen, C. W., Dybdahl-Sissoko, N., and Evans, D. 1994. apoptosis: a mechanism of cell killing by influenza a and b viruses. *Journal of Virology* 68(6): 3667-73.
- Mineral** Hintz, H. F. 1996. mineral requirements of growing horses. *Pferdeheilkunde* 12(3): 303-306.
- Abstract** Hintz, S. R., Vreman, H. J., and Stevenson, D. K. mortality after light exposure of tin protoporphyrin-treated neonatal rats. *ANNUAL MEETING OF THE WESTERN SOCIETY FOR PEDIATRIC RESEARCH, CARMEL, CALIFORNIA, USA, FEBRUARY 7-10, 1989. CLIN RES.* 37 (1). 1989. 205a.
- No Oral** Hintz, S. R., Vreman, H. J., and Stevenson, D. K. 1990. mortality of metalloporphyrin-treated neonatal rats after light exposure. *Developmental Pharmacology and Therapeutics* 14(3): 187-92.
- Diss** Hipp, W. 1989. cadmium retention in the liver and the kidneys of rats as influenced by different levels of zinc in the diet. <original> der einfluss der zinkversorgung auf die cadmiumretention in leber und niere der ratte in einem langzeitversuch. 100 P.
- CP** Hipp, W., Kollmer, W. E., Berg, D., Zucker, H., and Rambeck, W. A. 1991. influence of zinc in the diet on cadmium retention in rats. *Trace Elem. Man Anim. 7: Monogr. Proc., Round Tables Discuss. Int. Symp., 7th* : Meeting Date 1990, 26-12-26/13. Editor(s): Momcilovic, Berislav. Publisher: Inst. Med. Res. Occup. Health Univ. Zagreb, Zagreb, Yugoslavia..
- Nut** Hirabayashi, Miho, Matsui, Tohru, and Yano, Hideo. fermentation of soybean flour with aspergillus usamii improves availabilities of zinc and iron in rats. *J. Nutr. Sci. Vitaminol.* (1998) 44(6): 877-886.
- No Dose** Hirabayashi, Miho, Matsui, Tohru, and Yano, Hideo. fermentation of soybean meal with aspergillus usamii improves zinc availability in rats. *Biol. Trace Elem. Res.* (1998) 61(2): 227-234.

- No Oral** Hirai, M., Nomiyama, H., and Nomiyama, K. studies on zinc fever. (3). persistent anorexia in rabbits given a large dose of intravenous zinc sulfate. *Biomed. Res. Trace Elem.* (1992) 3(2): 163-4.
- No Oral** Hirai, Manabu, Nomiyama, Hiroko, and Nomiyama, Kazuo. persistent anorexia in rabbits given a large dose of intravenous zinc sulfate. *Biomed. Res. Trace Elem.* (1992) 3(3): 313-18.
- No Oral** Hirano, S., Higo, S., Tsukamoto, N., Kobayashi, E., and Suzuki, K. T. 1989. metabolic behavior and pulmonary toxicity of zinc oxide instilled into rat lung. *EISEI KAGAKU* VOL. 35, NO. 1: p. 19.
- Unrel** Hirano, S., Kodama, N., Shibata, K., and Suzuki, K. T. 1990. distribution, localization, and pulmonary effects of yttrium chloride following intratracheal instillation into the rat. *Toxicology and Applied Pharmacology* 104(2): 301-11.
- No Oral** HIRANO, S., TSUKAMOTO, N., KOBAYASHI, E., and SUZUKI, K. T. 1989. toxicity of cadmium oxide instilled into the rat lung i. metabolism of cadmium oxide in the lung and its effects on essential elements. *TOXICOLOGY*; 55 (1-2). 1989. 15-24.
- Nut def** Hiraoka, Hiroshi. role of zinc in brain excitability. the effect of disturbed zinc metabolism on brain excitability and relation of brain carbonic anhydrase (zinc metalloenzyme) to brain excitability. *Bull. Yamaguchi Med. Sch.* (1966) 13(4): 269-80.
- Alt** Hirata Hiroshi, Ladenheim Bruce, Carlson Elaine, Epstein Charles, and Cadet Jean Lud(A). 1996. autoradiographic evidence for methamphetamine-induced striatal dopaminergic loss in mouse brain: attenuation in cuzn-superoxide dismutase transgenic mice. *Brain Research* 714(1-2): 95-103.
- Phys** Hirayama, Y. 1990. histochemical localization of zinc and copper in rat ocular tissues. *Acta Histochemica* 89(1): 107-11.
- In Vit** Hirose, J., Ando, S., and Kidani, Y. excess zinc ions are a competitive inhibitor for carboxypeptidase a. *Biochemistry*. 26 (20). 1987. 6561-6565.
- Nut def** Hirose, J., Kano, H., Kidani, Y., Iwamoto, H., and Hiromi, K. zinc deficient bovine erythrocyte superoxide dismutase has low specific activity. *Chemical and Pharmaceutical Bulletin (Tokyo)*. 40 (2). 1992. 506-508.
- Mineral** Hirosue, Toshiko, Irie, Itsuko, and Hosogai, Yutaro. effect of ethanol administration on mineral contents in tissues of iron-deficient rats. *Shokuhin Eiseigaku Zasshi* (1990) 31(4): 314-22.
- Drug** Hirota, Hirohiko, Suzuki, Kazutomo, Oinuma, Goroh, Oyama, Rie, Hayashi, Emiko, Sakai, Yosinori, Okubo, Hitoshi, Hayashi, Youichi, Arakawa, Yasuyuki, and et al. alterations of trace elements in rats after alcohol administration. *Biomed. Res. Trace Elem.* (1996) 7(3): 237-238.
- Abstract** HIRSCH, K. S., SHRADER, R. E., LEVIN, J., and HURLEY, L. S. attenuation of 6-mercaptopurine teratogenesis by high dietary zinc. *TERATOLOGY* 13:25A,1976
- CP** HIRSCHBERG, R., VON HERRATH D, PAULS, A., and SCHAEFER, K. 1985. influence of parathyroid hormone and 1 25 dihydroxyvitamin d-3 on the organ distribution of aluminum and zinc in normal and uremic rats . *NORMAN*
- In Vit** Hisanaga, K., Sagar, S. M., and Sharp, F. R. n methyl-d-aspartate antagonists block fos-like protein expression induced via multiple signaling pathways in cultured cortical neurons. *J*

NEUROCHEM. Journal of Neurochemistry. 58 (5). 1992. 1836-1844.

- Rev** Hitz, J., Devaux, F., Galli, F., Siest, G., and Kiechel, J. R. reference values for biochemical tests and enzymes in mini-pigs. *Annales De Biologie Clinique.* 45 (5). 1987. 532-536.
- Surv** Hlasny, J., Pind'ak, J., and Schwub, J. 1997. thymus development in calves kept under normal feeding regimen. *Stocarstvo* 51(1): 15-21.
- Nut def** Ho, S. K. and Hidioglou, M. 1977. effects of dietary chelated and sequestered zinc and zinc sulfate on growing lambs fed a purified diet. *Canadian Journal of Animal Science* 57(1): 93-99.
- Phys** Ho, Y. S., Gargano, M., Cao, J., Bronson, R. T., Heimler, I., and Hutz, R. J. 1998. reduced fertility in female mice lacking copper-zinc superoxide dismutase. *Journal of Biological Chemistry* 273(13): 7765-9.
- Alt** HO, Y. S., MAGNENAT, J. L., GARGANO, M., and CAO, J. the nature of antioxidant defense mechanisms: a lesson from transgenic studies. *ENVIRONMENTAL HEALTH PERSPECTIVES; 106 (SUPPL. 5).* 1998. 1219-1228.
- HHE** Hoadley, J. E. and Cousins, R. J. regulatory mechanisms for intestinal transport of zinc and copper. PRASAD, A. S. (ED.). *CURRENT TOPICS IN NUTRITION AND DISEASE, VOL. 18. ESSENTIAL AND TOXIC TRACE ELEMENTS IN HUMAN HEALTH AND DISEASE; FIRST INTERNATIONAL MEETING OF THE INTERNATIONAL SOCIETY FOR TRACE ELEMENT RESEARCH IN HUMANS, PALM SPRINGS, CALIFORNIA, USA, DECEMBER 8-12, 1986. XXIII+679P. ALAN R. LISS, INC.: NEW YORK, NEW YORK, USA. ILLUS. ISBN 0-8451-1617-7. 0 (0).* 1988. 141-156.
- Nut def** Hoadley, J. E., Leinart, A. S., and Cousins, R. J. 1987. kinetic analysis of zinc uptake and serosal transfer by vascularly perfused rat intestine. *American Journal of Physiology* 252(6 Pt 1): G825-31.
- Nut def** Hoadley, J. E., Leinart, A. S., and Cousins, R. J. 1988. relationship of ⁶⁵zn absorption kinetics to intestinal metallothionein in rats: effects of zinc depletion and fasting. *The Journal Of Nutrition.* 118(4): 497-502.
- CP** HOADLEY, J. E., TAO, S. H., and FOX, M. RS. 1989. dietary cadmium and zinc effects on peripheral neuromuscular development in japanese quail. *73RD ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY*
- Nut def** Hoadley, James E. and Cousins, Robert J. effects of dietary zinc depletion and food restriction on intestinal transport of cadmium in the rat. *Proc. Soc. Exp. Biol. Med. (1985)* 180(2): 296-302.
- Nut def** Hoadley, James E., Leinart, Annette S., and Cousins, Robert J. kinetic analysis of zinc uptake and serosal transfer by vascularly perfused rat intestine. *Am. J. Physiol. (1987)* 252(6, Pt. 1): G825-G831.
- Abstract** Hoag, G. N., Brown, R. G., Smart, M. E., and Slinger, S. J. trace mineral metabolism in the chondro dysplastic alaskan malamutes dan-dan. *Federation Proceedings.* 33 (3 Part 1). 1974 668
- FL** Hock, E., Halle, I., Matthes, S., and Jeroch, H. 1997. investigations on the composition of the ileal and caecal microflora of broiler chicks in consideration to dietary enzyme preparation and zinc bacitracin in wheat-based diets. <original> untersuchungen ueber die zusammensetzung der ilealen und caecalen mikroflora von broilern unter beruecksichtigung der supplementierung eines

enzympraeparates und zink-bacitracin zu weizenreichen futtermischungen. *Agribiological Research*. V. 50(1) P. 85-95

- FL** Hodate, K. National Inst. of Animal Industry Kukizaki Ibaraki Japan, Hamada, T., and Maeda, S. 1995. the effects of adding linseed oil, copper and vitamin e to diets on copper, vitamin e and lipid peroxidation in the tissues of growing pigs. *Animal Science and Technology*. V. 66(2) P. 142-148
- Phys** Hodge, G., Makarious, M. M., Charlesworth, J. A., and Duggan, K. A. 1997. acute but not chronic angiotensin-converting enzyme inhibition induces enzyme synthesis in the glomerulus of the spontaneously hypertensive rat. *Clinical and Experimental Pharmacology & Physiology* 24(6): 460-2.
- Unrel** Hodgson, S. Cominco Alaska AK. development work continues for open-pit mining at red dog. *Mining Eng*. V40, N12, P1101(4)
- FL** Hoehler, D. Giessen Univ. Germany Inst. fuer Tierernaehrung, Pallauf, J., and Rimbach, G. 1991. effect of a microbial phytase supplementation on the utilization of trace elements in the piglet. <original> einfluss einer zulage an mikrobieller phytase auf die verwertung von spurenelementen beim aufzuchtferkel. environmental aspects of animal production. <original> umweltaspekte der tierproduktion. P. 475-480. No. 33
- FL** Hoehler, D. Kiel Univ. Germany Inst. fuer Tierernaehrung und Stoffwechselphysiologie, Rimbach, G., Pallauf, J., Anke, M., Groppel, B., Guertler, H., Gruen, M., Lombeck, I., and Schneider, H. J. 1992. investigations into the zinc metabolism of piglets with differing zinc supply and citric acid and phytase supplementation to a maize-soybean diet. <original> untersuchungen zum zn-stoffwechsel des ferkels bei differierender alimentaerer zn-zufuhr und citronensaeure-bzw. phytasezulagen zu einer mais-soja-diaet. macro and trace elements. <original> mengen- und spurenelemente. P. 81-88
- CP** Hoekstra, W. G. the complexity of dietary factors affecting zinc nutrition and metabolism in chicks and swine. *MILLS, C. F. (EDITED BY). TRACE ELEMENT METABOLISM IN ANIMALS. PROCEEDINGS OF A WORLD ASSOCIATION FOR ANIMAL PRODUCTION INTERNATIONAL BIOLOGICAL PROGRAMME SYMPOSIUM. XXV + 549P. ILLUS. E. AND S. LIVINGSTONE, PUBLISHERS: EDINBURGH, GREAT BRITAIN. 1970 347-353*
- Abstract** Hoekstra, W G. development of zinc nutrition research with emphasis on relationships with other nutrition and special factors illustrating species differences. [chickens] . *In Inst On Anim Nutr, 1969. Specific Nutr In Anim Nutr* 1970 p. 129-145.
- Nut def** Hoeve, L. J., Wensink, J., and Mertens zur Borg, I. R. 1990. hearing loss related to zinc deficiency in rats. *European Archives of Oto-Rhino-Laryngology* 247(5): 267-70 .
- Unrel** Hofer, G., Grimmer, C., Sukhatme, V. P., Sterzel, R. B., and Rupprecht, H. D. 1996. transcription factor egr-1 regulates glomerular mesangial cell proliferation. *Vol. 271, No. 45, Pp. 28306-28310 J. Biol. Chem.*
- Unrel** Hofer, M. A. and Shair, H. sensory processes in the control of isolation induced ultrasonic vocalization by 2 week old rats. *Journal of Comparative and Physiological Psychology*. 94 (2). 1980. 271-279.
- No Oral** HOFFMAN, D. J. and EASTIN, W. C. JR. 1981. effects of industrial effluents, heavy metals, and organic solvents on mallard embryo development. 9:35-40, 1981 *TOXICOL LETT* . 9: 35-40.
- No Oral** Hogan, G. Richard, Cole, Barry S., and Lovelace, James M. sex and age mortality responses in

zinc acetate-treated mice. *Bull. Environ. Contam. Toxicol.* (1987) 39(1): 156-61.

- Nut** Hogg, A. 1998. what every practitioner should know about swine health and immunization. *Large Animal Practice* 19(6): 20, 22.
- BioX** Hohler, D., Pallauf, J., and Rimbach, G. 1991. effect of supplementing microbial phytase on trace element utilization in growing pigs. (33): 475-480.
- Abstract** HOKE, G. D. and LLEWELLYN, G. C. aflatoxicosis and dietary zinc interactions in hamsters. *ASB (ASSOC SOUTHEAST BIOL) BULL*; 25 (2). 1978 88
- No Oral** Holbrook, J., Fields, M., Smith, J. Cecil Jr., Reiser, S., and et al. tissue distribution and excretion of copper-67 intraperitoneally administered to rats fed fructose or starch. *J. Nutr.* (1986) 116(5): 831-8.
- Nut** Holder, D. P. and Huntly, D. M. 1978. influence of added manganese, magnesium, zinc, and calcium level on eggshell quality. *Poultry Science* 57(6): 1629-1634.
- Surv** Holder, N. L., Smith, J. W., and Surujbally, R. S. Livestock Development Company Georgetown Guyana. 1982. problems and prospects for milk and beef production in the intermediate savannahs of Guyana. milk production systems project design workshop, Georgetown, Guyana, 28 feb - 5 mar 1982. P. 18-51
- Unrel** Holland, C. Jr and Holland, R. pulpal reactions to the zinc phosphate cement histological study in dogs. *Revista Da Faculdade De Odontologia De Aracatuba*. 4 (1). 1975 109-118.
- Fate** Holland, D. R., Cousens, L. S., Meng, W., and Matthews, B. W. 1994. nerve growth factor in different crystal forms displays structural flexibility and reveals zinc binding sites. *Journal of Molecular Biology* 239(3): 385-400.
- No COC** Holland, G. R. 1994. a histological comparison of periapical inflammatory and neural responses to two endodontic sealers in the ferret. *Archives of Oral Biology* 39(7): 539-44.
- No COC** Holland, G. R. 1996. steroids reduce the periapical inflammatory and neural changes after pulpectomy. *Journal of Endodontics* 22(9): 455-8.
- FL** Holland Junior, C. and Holland, R. 1975. [pulpal reactions to the zinc-phosphate cement. histological study in dogs]. <original> comportamento da polpa dental frente ao forramento cavitário com cimento de fosfato de zinco. estudo histológico em cães. *Revista Da Faculdade De Odontologia De Aracatuba* 4(1): 109-17.
- FL** Holland, R., Maisto, O. A., de Souza, V., Maresca, B. M., and Nery, M. J. 1986. [comparative histology of dog teeth overfilled with 3 materials]. <original> comparación histológica de dientes de perros sobreobturados con tres materiales. *Revista Espanola De Endodoncia* 4(3): 79-86.
- Unrel** Holland, R., Nery, M. J., Souza, V. D., Mello, W. D., and Bernabe, P. F. E. a long term histological study of periapical tissues of dog's teeth after over-filling with two types of gutta-percha points. *Revista De Odontologia Da UNESP (Universidade Estadual Paulista)*. 14 (1-2). 1985 (Recd. 1987). 13-18.
- Unrel** Holland, R., Otoboni Filho, J. A., Bernabe, P. F., de Souza, V., Nery, M. J., and Dezan Junior E. 1998. effect of root canal filling material and level of surgical injury on periodontal healing in dogs. *Endodontics & Dental Traumatology* 14(5): 199-205.
- Unrel** Holland, R., Otoboni Filho, J. A., Bernabe, P. F., Nery, M. J., de Souza, V., and Berbert, A. 1994.

effect of root canal status on periodontal healing after surgical injury in dogs. *Endodontics & Dental Traumatology* 10(2): 77-82.

- Unrel** Holland, R., Otoboni Filho, J. A., de Souza, V., Nery, M. J., Bernabe, P. F., and Dezan Junior E. 1998. calcium hydroxide and a corticosteroid-antibiotic association as dressings in cases of biopulpectomy. a comparative study in dogs' teeth. *Brazilian Dental Journal* 9(2): 67-76.
- Unrel** Holland, R., Soares, I. J., and Soares, I. M. 1992. influence of irrigation and intracanal dressing on the healing process of dogs' teeth with apical periodontitis. *Endodontics & Dental Traumatology* 8(6): 223-9.
- Unrel** Holland, R., Soares, I. J., Soares, T. M. L., and Dias, N. V. the effect of the dressing in the tissue reactions following apical plugging of the root canal of dogs' pulpless teeth with dentin chips. *REV ODONTOL UNESP (UNIV ESTADUAL PAUL)*. *Revista De Odontologia Da UNESP (Universidade Estadual Paulista)*. 18 (1-2). 1989. 101-108.
- Unrel** HOLLAND, R., SOUZA, V., NERY, M. J., and BARNARE, P. FE. behavior of rat subcutaneous connective tissue to implants of polyethylene tubes partially or totally filled with various root canal filling materials. *REV BRAS ODONTOL*; 28 (171). 1971 197-201
- No Oral** Holleran, W. M., Galardy, R. E., Gao, W. N., Levy, D., Tang, P. C., and Elias, P. M. 1997. matrix metalloproteinase inhibitors reduce phorbol ester-induced cutaneous inflammation and hyperplasia. *Archives of Dermatological Research* 289(3): 138-44 .
- No Oral** Hollinger, Mannfred A., Giri, Shri N., and Freywald, Mary. effect of parenteral zinc on paraquat toxicity in the rat. *Res. Commun. Chem. Pathol. Pharmacol.* (1977) 18(4): 689-96 .
- In Vit** Hollrigel, G. S. and Soltesz, I. 1997. slow kinetics of miniature ipscs during early postnatal development in granule cells of the dentate gyrus. *Journal of Neuroscience* 17(13): 5119-28.
- BioX** Holm, A. 1990. e. coli associated diarrhoea in weaner pigs: zinc oxide added to the feed as a preventive measure. 154.
- Bact** Holm, A. 1988. escherichia coli-associated post-weaning diarrhoea in piglets. zinc oxide added to feed as an antibacterial agent? *Dansk Veterinaertidsskrift* 71(21): 1118-1126.
- Bact** HOLM, A. escherichia-coli conditioned weaning diarrhea in swine zinc oxide feed additive as an antibacterial principle. *DAN VETERINAERTIDSSKR*; 71 (21). 1988. 1118-1126.
- CP** Holm, A., Poulsen, H. D., <Editors> Poomvises, P., and Ingkaninun, P. 1994. effect of feeding high level of zinc oxide on zinc concentration in pigs at slaughter. <document title>proceedings: the 13th international pig veterinary society congress, bangkok, thailand, 26-30 june 1994. 276.
- No Dose** Holm L(A), Ekwall, H., Wishart, G. J., and Ridderstrale, Y. 2000. localization of calcium and zinc in the sperm storage tubules of chicken, quail and turkey using x-ray microanalysis. *Journal of Reproduction and Fertility* 118(2): 331-336.
- Diss** Holm, L. SLU Uppsala Sweden Inst. foer Djurfysiologi. 1999. a comparative study of avian oviducal sperm storage with special reference to factors which regulate sperm motility. 36 P. No. 141
- Phys** Holmes, M., Turner, J., Fox, A., Chisholm, O., Crossley, M., and Chong, B. 1999. hfg-2, a novel zinc finger protein, binds the co-repressor mctbp2 and modulates gata-mediated activation. Vol. 274, No. 33, Pp. 23491-23498 *Journal Of Biological Chemistry*

- In Vit** Holmes, R. S. purification, molecular properties and ontogeny of carbonic anhydrase isoenzymes. evidence for a, b and c isoenzymes in avian and mammalian tissues. *Eur. J. Biochem.* (1977) 78(2): 511-20.
- No Oral** Holmes, W. G. ontogeny of dam-young recognition in captive beldings ground squirrels *spermophilus-beldingi*. *Journal of Comparative Psychology.* 98 (3). 1984. 246-256.
- CP** Holody, D., Strzezek, J., Kordan, W., and Torska, J. 1996. multifunction of zn-2+-dependent glycoprotein complex from boar seminal vesicle glands. *Reproduction in Domestic Animals* 31(1): 243-244.
- Phys** Holody Dariusz(A) and Strzezek Jerzy. 1999. heparin- and zn2+-binding proteins from boar seminal plasma. *Acta Biochimica Polonica* 46(4): 935-939.
- Drug** Holper, J. C. 1966. *Research and Development of Rhinovirus, RS and Mycoplasma Pneumoniae Vaccines.* <NOTE> *Semi-Annual Contract Progress Rept.*, 1 Sep 65, 1 Mar 66
- No COC** Holt, Daphne, Dinsdale, D., and Webb, M. 1986. intestinal uptake and retention of copper in the suckling rat , *rattus rattus*. i. distribution and binding. *Comp. Biochem. Physiol. C: Comp. Pharmacol. Toxicol.* 83C(2): 313-16 .
- No COC** Holt, Daphne, Snowden, R., Dinsdale, D., and Webb, M. 1987. intestinal uptake and retention of copper in the suckling rat , *rattus rattus*. iv. mechanisms of intestinal copper accumulation. *Comp. Biochem. Physiol. C: Comp. Pharmacol. Toxicol.* 86C(1): 191-200 .
- No Tox** Holtz, W. and Foote, R. H. composition of rabbit semen and the origin of several constituents. *Biology of Reproduction.* 18 (2). 1978 286-292.
- No Dose** Homma, S., Suzuki, J. S., Nishimura, N., Nishimura, H., and Tohyama, C. the change of zinc and metallothionein levels in genital organs of male rats . *Biomed. Res. Trace Elem.* (1993) 4(2): 65-6 .
- Nut def** Hommerich, G. 1983. effects of chronic zinc deficiency on adult dogs. 87pp.
- Nut def** Hommerich, G. 1983. studies on the effects of chronic zinc deficiency on the fully-grown dog. 87pp.
- Rev** Homsy, J., Morrow, W. J., and Levy, J. A. 1986. nutrition and autoimmunity: a review. *Clinical and Experimental Immunology* 65(3): 473-88.
- Bio Acc** Honda, K., Min, B. Y., and Tatsukawa, R. 1986. distribution of heavy metals and their age-related changes in the eastern great white egret, *egretta alba modesta*, in korea. *ARCH ENVIRON CONTAM TOXICOL.* 15(2): p185-198.
- FL** Honda, Y. 1996. [cellular and molecular biology of ischemic retina]. *Nippon Ganka Gakkai Zasshi* 100(12): 937-55.
- Phys** Honkaniemi, J. and Sharp, F. R. 1996. global ischemia induces immediate-early genes encoding zinc finger transcription factors. *Vol. 16, No. 4, Pp. 557-565* *J. Cereb. Blood Flow Metab.*
- Nut def** Honory, Kazimierz. the effect of zinc on the assimilation of .beta.-carotene in poultry. *Bull. Vet. Inst. Pulawy* (1978) 22(3-4): 77-80.
- Nut def** Hooda, A., Mehta, U., and Bhat, C. M. zinc retention as affected by different levels of dietary zinc and protein in rats. *Nutr. Rep. Int.* (1984) 30(1): 63-9.

- Phys** Hoog, C., Schalling, M., Grunder-Brundell, E., and Daneholt, B. 1991. analysis of a murine male germ cell-specific transcript that encodes a putative zinc finger protein. *Molecular Reproduction and Development* 30(3): 173-81.
- Unrel** Hoover, J., Thoma, G. W., and Madden, R. M. 1980. the effect of endodontic sealers on bone. *Journal of Endodontics* 6(6): 586-90.
- Abstract** Hoover, S. L(A), Carlson, M. S(A), Hill, G. M(A), Link, J. E(A), Ward, T. L., and Fakler, T. M. 1997. evaluation of excretion and retention of zinc from inorganic and organic sources in diets fed to weanling pigs. *Journal of Animal Science* 75(SUPPL. 1): 189.
- Abstract** Hoover, S. L(A), Ward, T. L., Hill, G. M(A), and Fakler, T. M. 1997. effect of dietary zinc and copper amino acid complexes on growth performance of starter pigs. *Journal of Animal Science* 75(SUPPL. 1): 188.
- No Oral** Hopf, G., Boecker, R., Bischoff, J., Werner, M. G., and Estler, C. J. investigation into the combined effects of ethanol and cadmium on rat liver and kidneys. *Arch. Toxicol.* (1990) 64(6): 470-3.
- CP** Hopkins, R. G. and Failla, M. L. 1995. chronic ingestion of marginally low copper diet impairs lymphocyte and neutrophil function in male rats without influencing conventional measures of copper status. *FASEB Journal* 9(4): A724.
- In Vit** Hori, N., Galeno, T., and Carpenter, D. O. responses of pyriform cortex neurons to excitatory amino acids voltage dependence conductance changes and effects of divalent cations. *Cellular and Molecular Neurobiology.* 7 (1). 1987. 73-90.
- Mix** HORKY, D., LAUSCHOVA, I., ILLEK, J., PECHOVA, A., and SINDELAR, M. distribution of exogenous heavy metals in hepatocytes of calf: a morphometric study. *SCRIPTA MEDICA (BRNO)*; 70 (8). 1997. 409-416.
- Fate** Horky, D. Masarykova Univ. Brno Czech Republic Lekarska Fakulta, Illek, J., and Pechova, A. 1998. distribution of heavy metals and their ultrahistochemical determination in the organs of calves. *Acta Veterinaria.* V. 67(1) P. 51-58
- No Oral** Hornfeldt, C. S. and Larson, A. A. 1989. selective inhibition of excitatory amino acids by divalent cations. a novel means for distinguishing n-methyl-d-aspartic acid-, kainate- and quisqualate-mediated actions in the mouse spinal cord. *Journal of Pharmacology and Experimental Therapeutics* 251(3): 1064-8.
- Phys** Hornfeldt, Carl S. and Larson, Alice A. selective inhibition of excitatory amino acids by divalent cations. a novel means for distinguishing n-methyl-d-aspartic acid-, kainate- and quisqualate-mediated actions in the mouse spinal cord. *J. Pharmacol. Exp. Ther.* (1989) 251(3): 1064-8.
- Bio Acc** Hornshaw, T. G., Aulerich, R. J., Ringer, R. K., and Martin, M. B. 1985. mineral concentrations in the hair of natural dark and pastel mink(*Mustela vison*). *Scientifur* 9(3): 216-219.
- No COC** Hornstra, H. W., Overbeek, G. A., Zayed, I., Jagar, E. de, and Vies, J. van der. 1971. analysis of mortality after prolonged treatment of rats with high doses of a depot form of tetracosactide. *Arzneimittel-Forschung* 21(5): 664-71.
- No COC** Horst, R. L. and Jorgensen, N. A. 1974. effect of ammonium chloride on nitrogen and mineral balance in lactating and nonlactating goats. *Journal of Dairy Science* 57(6): 683-688.
- Prim** Horsted, P., Hansen, J. C., and Langeland, K. 1982. studies on n2 cement in man and monkey--

cement lead content, lead blood level, and histologic findings. *Journal of Endodontics* 8(8): 341-50.

- Prim** Horsted, P. B., Simonsen, A. M., and Larsen, M. J. 1986. monkey pulp reactions to restorative materials. *Scandinavian Journal of Dental Research* 94(2): 154-63.
- HHE** Hortin, Audra E., Oduho, George, Han, Yanming, Bechtel, Peter J., and Baker, David H. bioavailability of zinc in ground beef. *J. Anim. Sci.* (1993) 71(1): 119-23.
- HHE** Horvath, D. J., Barker, F. W., Thayne, W. V., and Frost, J. L. 1984. selenium, cadmium, zinc, and copper in human-kidney cortices and post-mortem indexes of hypertension. *Biological Trace Element Research* 6(3): 225-236.
- HHE** Horwood, Michelle. trace element analysis of human bone from the prehistoric moriori of the chatham islands, with special reference to diet. *J. R. Soc. N. Z.* (1989) 19(1): 59-71.
- FL** Hoshino, M. the two year chronic toxicity examination of zinc salt of polyoxin d in mice (detailed report). *Nippon Daigaku Igaku Zasshi (Nippon Univ. Med. J.)* 38(5): 1015-1052 1979 (7 References)
- FL** Hoshino, M. and Tokunaga, Y. chronic toxicity test on polyoxin d- zinc salt administered to mice for 24 months. *Nichidai Igaku Zasshi (Nippon Univ. Med. J.)* 37(9): 1122 1978
- FL** Hoskam, E. G., Graaf, G. J. de, Noorman, N., and Over, H. J. 1982. zinc poisoning in foals. *Tijdschrift Voor Diergeneeskunde* 107(18): 672-680.
- Org Met** Hoskam, E. G and Lieshout van, C. G. incidental mortality of wild birds resulting from abusive applications of pesticides. *TNO-Nieuws*; 27(10): 589-593; 1972 ; (REF:5)
- CP** Hossain, S. and Bertechini, A. G. requirement and bioavailability of zinc from inorganic sources. *EIGHTY-FIRST ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, FAYETTEVILLE, ARKANSAS, USA, AUGUST 3-6, 1992. POULT SCI.* 71 (Suppl. 1). 1992. 33.
- FL** Hossain, S. and Bertechini, A. G. 1993. requirement of zinc for growing rabbits. *Arquivo Brasileiro De Medicina Veterinaria e Zootecnia* 45(3): 323-329.
- No COC** Hossain S(A) and Almeida, M. J. M. 1994. effects of natural zeolite on performance of weanling piglets. *Arquivo Brasileiro De Medicina Veterinaria e Zootecnia* 46(6): 665-674.
- Surv** Hothem, R. L., Lonzarich, D. G., Takekawa, J. E., and Ohlendorf, H. M. 1998. contaminants in wintering canvasbacks and scaups from san francisco bay, california. *ENVIRONMENTAL MONITORING AND ASSESSMENT.* 50(1): 67-84.
- Mineral** Hou Y-H, Zhang L-S, Zhou H-M, Wang R-S, and Zhang Y-Z. influences of refined konjac meal on the levels of tissue lipids and the absorption of four minerals in rats. *BIOMED ENVIRON SCI.* 3 (3). 1990. 306-314.
- FL** Hou, Yunhua, Zhang, Lishi, Zhou, Hongming, Wang, Ruishu, Shi, Yuangang, Tang, Lihua, Zhang, Yinzhu, Zheng, Zhiren, and Qin, Yufang. influences of konjak-polysaccharide on the levels of tissue lipids and four inorganic elements in rats. *Yingyang Xuebao (1988)* 10(3): 245-52.
- CP** House, W., Van Campen D, and Welch, R. 1994. methionine enhances zinc absorption from corn kernels. *FASEB Journal* 8(4-5): A716.

- Mineral** House, W. A., Crooker, B. A., and Bauman, D. E. 1991. utilization of sulfur and other mineral elements by growing dairyheifers treated with bovine somatotropin. *Journal of Animal Science* 69(9): 3817-3825.
- Mix** House, W. A. and Welch, R. M. 1989. bioavailability of and interactions between zinc and selenium in rats fed wheat grain intrinsically labeled with ⁶⁵zn and ⁷⁵se. *The Journal Of Nutrition*. 119(6): 916-921.
- CP** House, W. A., Welch, R. M., and Van Campen, D. R. 1978. zinc kinetics and metabolism in rats fed diets with or without phytic acid. *Trace Elem. Metab. Man Anim. Proc. Int. Symp., 3rd* : Meeting Date 1977, 171-4. Editor(s): Kirchgessner, M. Publisher: Arbeitskreis Tierernaehrungsforschung Weihenstephan Inst. Ernaehrungsphysiol., Freising-Weihenstephan, Ger.
- Nut** House, William A., Van Campen, Darrell R., and Welch, Ross M. dietary methionine status and its relation to the bioavailability to rats of zinc in corn kernels with varying methionine content. *Nutr. Res. (N. Y.)* (1996) Volume Date 1997, 17(1): 65-76 .
- Nut** House, William A., Van Campen, Darrell R., and Welch, Ross M. influence of dietary sulfur-containing amino acids on the bioavailability to rats of zinc in corn kernels. *Nutr. Res. (N. Y.)* (1996) 16(2): 225-35 .
- Fate** House, William A. and Wastney, Meryl E. compartmental analysis of zinc kinetics in mature male rats. *Am. J. Physiol.* (1997) 273(3, Pt. 2): R1117-R1125.
- Mix** House, William A., Welch, Ross M., and Van Campen, Darrell R. 1982. effect of phytic acid on the absorption, distribution, and endogenous excretion of zinc in rats. *J. Nutr.* 112(5): 941-53 .
- Rev** Houston Doreen M(A) and Myers Sherry L. 1993. a review of heinz-body anemia in the dog induced by toxins. *Veterinary and Human Toxicology* 35(2): 158-161.
- Rev** Howard, B. R. 1992. health risks of housing small psittacines in galvanized wire mesh cages. *Journal of the American Veterinary Medical Association* 200(11)
- Alt** Howell, J. M. and Mercer, J. F. 1994. the pathology and trace element status of the toxic milk mutant mouse. *Journal of Comparative Pathology* 110(1): 37-47.
- Carcin** Hoyt Peter R, Bartholomew Christopher, Davis Amy J, Yutzey Katherine, Gamer Laura W, Potter, S. Steven, Ihle James N, and Mucenski Michael L(A). 1997. the evil proto-oncogene is required at midgestation for neural, heart, and paraxial mesenchyme development. *Mechanisms of Development* 65(1-2): 55-70.
- Bio Acc** Hoyt, Z. K., Potter, G. D., Greene, L. W., and Anderson, J. G. Jr. 1995. copper balance in miniature horses fed varying amounts of zinc. *Journal of Equine Veterinary Science* 15(8): 357-359.
- No Oral** HRABAC, B. and RADOVIC, S. a protective effect of zinc in chromium poisoned rats. *ARH HIG RAD TOKSIKOL*; 42 (2). 1991. 215-224.
- FL** Hristic, V. and Knezevic, Jovanka. effect of cadmium on the trace element status in chicks. *Veterinaria (Sarajevo)* (1980) 29(1-2): 166-70.
- In Vit** Hrubá, A., Paluska, E., and Chudomel, V. influence of the incubation of cells with zinc and lithium ions of graft-vs.-host reactivity of cells and on their ability to form hemopoietic colonies.

Folia Biologica (Prague). 32 (2). 1986. 81-90.

- In Vit** Hrubá, Alena, Paluska, E., and Chudomel, V. 1986. influence of the incubation of cells with zinc and lithium ions on gvh reactivity of cells and on their ability to form hemopoietic colonies. *Folia Biol. (Prague)* 32(2): 81-90.
- FL** Hryshko, H I. growth rate of ducklings relative to supplements of manganese and zinc salts in mixed feed. *Ptakhivnitstvo* 1972 13: 40-45.
- Phys** Hsiao, Shu-Huei, West, James R., Mahoney, Jolonda C., and Frye, Gerald D. postnatal ethanol exposure blunts upregulation of gabaa receptor currents in purkinje neurons. *Brain Res.* (1999) 832(1,2): 124-135.
- Plant** Hsieh ChingFang and Hsu KuoNan. 1995. effect of continuous use of organic manures on the growth and yield of vegetable soyabean and cabbage. *Bulletin of Taichung District Agricultural Improvement Station* (46): 1-10.
- Nut def** Hsieh, H. S. and Navia, J. M. 1980. zinc deficiency and bone formation in guinea pig alveolar implants. *Journal of Nutrition* 110(8): 1581-8.
- Nut def** Hsieh, H. Steve and Navia, Juan M. zinc deficiency and bone formation in guinea pig alveolar implants. *J. Nutr.* (1980) 110(8): 1581-8 .
- Nut def** Hsieh, Steve, Navia, Juan M., and Bradley, Edwin. biological assay for zinc availability in wheat germ. *Sci. Total Environ.* (1983) : 28, 393-8.
- FL** Hsu, A. and Lin, Y.-F. 1994. effects of sulfur amino acid levels on performance and liver copper and iron stores of weanling pigs fed a high-copper diet. *Journal of the Chinese Society of Animal Science* 23(1): 1-9.
- CP** Hsu, A. L., Chen, T. C., Lee, M. L., Twu, H. N., <Editors> Djajanegara, A., and Sukmawati, A. 1994. effects of dietary zinc and folic acid during gestation on reproductive performance of sows. <document title>sustainable animal production and the environment. proceedings of the 7th aaap animal science congress, bali, indonesia, 11-16 july, 1994. volume 3: poster papers. 111-112.
- Nut def** Hsu, D., Meyer, J., Gerson, S., and Daniel, J. 1991. sequence of changes in rat buccal mucosa induced by zinc deficiency. *Journal of Oral Pathology & Medicine* 20(9): 443-8.
- Nut def** Hsu, D. J., Daniel, J. C., and Gerson, S. J. effect of zinc deficiency on keratins in buccal epithelium of rats. *Arch. Oral Biol.* (1991) 36(10): 759-63
- CP** Hsu, D. J., Daniel, J. C., Meyer, J., and Gerson, S. keratin polypeptide modification in rat buccal epithelium. 68TH GENERAL SESSION OF THE INTERNATIONAL ASSOCIATION FOR DENTAL RESEARCH AND THE 19TH ANNUAL SESSION OF THE AMERICAN ASSOCIATION FOR DENTAL RESEARCH, CINCINNATI, OHIO, USA, MARCH 7-11, 1990. *J DENT RES.* 69 (Spec. Issue Mar.). 1990. 196.
- Abstract** Hsu, F. S., Krook, L., Pond, W. G., and Duncan, R. 1973. lead zinc and calcium interrelationships in growing pigs. *Journal of Nutrition.* 103(7): 24.
- Alt** Hsu, H. H. T. and Anderson, H. C. effects of zinc and divalent cation chelators on atp hydrolysis and ca deposition by rachitic rat matrix vesicles. *Bone* (1995) 17(5): 473-7.
- HHE** Hsu, J. M. zinc as related to cystine metabolism. PRASAD, ANANDA S. (ED.). TRACE ELEMENTS IN HUMAN HEALTH AND DISEASE, VOL. 1. ZINC AND COPPER.

INTERNATIONAL SYMPOSIUM. DETROIT, MICH., U.S.A., JULY 10-12, 1974. XXIV+470P. ILLUS. ACADEMIC PRESS: NEW YORK, N.Y., U.S.A.; LONDON, ENGLAND. ISBN 0-12-564201-6. 1976 295-309

- Nut def** Hsu, J. M. and Anthony, W. L. 1975. effect of zinc deficiency and repletion on thymidine metabolism. *Clinical Chemistry* 21(4): 544-550.
- Nut def** Hsu, J. M. and Anthony, W. L. 1977. effect of zinc deficiency on sulfur-containing compounds in rat skin extracts. *Nutrition Reports International* 15(3): 319-324.
- Nut def** Hsu, J. M. and Anthony, W. L. 1975. effect of zinc deficiency on urinary excretion of nitrogenous compounds and liver amino acid-catabolizing enzymes in rats. *Journal of Nutrition* 105(1): 26-31.
- Nut def** Hsu, J. M. and Anthony, W. L. 1971. impairment of cystine-35s incorporation into skin protein by zinc-deficient rats. *Journal of Nutrition* 101(4): 445-52.
- Nut def** Hsu, J. M. and Anthony, W. L. 1971. metabolic fate of labeled cystine in zinc deficient rats. <Document Title> *Trace Substances in Environmental Health. IV.* 222-232.
- CP** Hsu, J. M. and Anthony, W. L. 1978. zinc - an essential element for hair growth. *Trace Elem. Metab. Man Anim. Proc. Int. Symp.*, 3rd : Meeting Date 1977, 222-5. Editor(s): Kirchgessner, M. Publisher: Arbeitskreis Tierernaehrungsforschung Weihenstephan Inst. Ernaehrungsphysiol., Freising-Weihenstephan, Ger..
- Nut def** Hsu, J. M., Anthony, W. L., and Buchanan, P. J. 1968. incorporation of glycine-1-14c into liver glutathione in zinc deficient rats. *Proceedings of the Society for Experimental Biology and Medicine*; 127
- Nut def** Hsu, J. M., Anthony, W. L., and Buchanan, P. J. 1969. zinc deficiency and incorporation of 14c-labeled methionine into tissue proteins in rats. *Journal of Nutrition* 99(4): 425-32.
- Nut def** Hsu, J. M., Anthony, W. L., and Buchanan, P. J. 1969. zinc deficiency and oxidation of l-methionine-methyl-14c in rats. *Journal of Nutrition* 97(3): 279-85.
- CP** Hsu, J. M., Anthony, W. L., and Buchanan, P. J. 1970. zinc deficiency and the metabolism of labeled cystine in rats. *Trace Elem. Metab. Anim. Proc. WAAP World Ass. Anim. Prod./IBP (Int. Biol. Progr.) Int. Symp.* Meeting Date 1969, 151-8. Editor(s): Mills, Colin F. Publisher: Livingstone, London, Engl..
- Nut def** Hsu, J. M., Kim, K. M., and Anthony, W. L. 1974. biochemical and electron microscopic studies of rat skin during zinc deficiency. <Document Title> *Protein-Metal Interactions.* 347-388.
- Nut def** Hsu, J. M. and Rubenstein, B. 1982. effect of zinc deficiency on histidine metabolism in rats. *The Journal Of Nutrition.* 112 (3): 461-467.
- Nut def** Hsu, J. M. and Woosley, R. L. 1972. metabolism of l-methionine-35s in zinc-deficient rats. *Journal of Nutrition* 102(9): 1181-1186.
- Nut def** Hsu, Jeng M. zinc deficiency and alterations of free amino acid levels in plasma, urine and skin extract. *Prog. Clin. Biol. Res. (1977)* 14(Zinc Metab.: Curr. Aspects Health Dis.): 73-86.
- Nut def** Hsu, Jeng M. zinc deficiency and glutathione linked enzymes in rat liver. *Nutr. Rep. Int.* (1982) 25(3): 573-82.

- CP** Hsu, Jeng M. and Anilane, Janet K. 1967. effect of zinc deficiency on zinc metalloenzymes in rats. *Proc. Int. Congr. Nutr. 7th* : Meeting Date 1966, Volume 5, 753-8 Publisher: Friedr. Vieweg and Sohn, Brunswick, Ger..
- Nut def** Hsu, Jeng M. and Anthony, William L. effect of zinc deficiency on sulfur-containing compounds in rat skin extracts. *Nutr. Rep. Int. (1977)* 15(3): 319-24.
- Nut def** Hsu, Jeng M. and Anthony, William L. effect of zinc deficiency on urinary excretion of nitrogenous compounds and liver amino acid-catabolizing enzymes in rats. *J. Nutr. (1975)* 105(1): 26-31.
- No COC** Hsu, Jeng M. and Smith, J. Cecil Jr. cysteine feeding affects urinary zinc excretion in normal and ethanol-treated rats. *J. Nutr. (1983)* 113(11): 2171-7.
- No Oral** Hsu, Jeng Mein and Anthony, William L. zinc deficiency and urinary excretion of taurine-35s and inorganic sulfate-35s following cystine-35s injection in rats. *J. Nutr. (1970)* 100(10): 1189-95.
- Nut def** Hsu, Jeng Mein, Anthony, William L., and Buchanan, P. J. zinc deficiency and incorporation of carbon-14 labeled methionine into tissue proteins in rats. *J. Nutr. (1969)* 99(4): 425-32.
- Nut def** Hsu, T. H. S. and Hsu, J. M. 1972. zinc deficiency and epithelial wound repair: an autoradiographic study of 3h-thymidine incorporation. *Proceedings of the Society for Experimental Biology and Medicine* 140(1): 157-160.
- Drug** Hu, Dayi, Li, Shumin, Tang, Chaoshu, Fan, Xiaolei, and Ma, Xiaoguang. protective effects of zn-induced metallothionein on myocardial injury of hypertensive rats. *Zhongguo Yaolixue Tongbao (1997)* 13(4): 338-340.
- In Vit** Hu, H. L., Wise, A., and Henderson, C. 1996. hydrolysis of phytate and inositol tri-, tetra-, and penta-phosphates by the intestinal mucosa of the pig. *Nutrition Research* 16(5): 781-787.
- Nut** Huan, Jianya, Cheeke, Peter R., Lowry, Robert R., Nakaue, Harry S., Snyder, Stanley P., and Whanger, Philip D. dietary pyrrolizidine (senecio) alkaloids and tissue distribution of copper and vitamin a in broiler chickens. *Toxicol. Lett. (1992)* 62(2-3): 139-53.
- FL** Huang Hui-Pi(A), Yang Heng-Leng, Tsai Huai-Ti, and Chen Kuang-Yang. 1995. application of insulin in the management of feline diabetes mellitus. *Journal of the Chinese Society of Veterinary Science* 21(4): 196-200.
- Nut def** Huang, J. K. and Chang, L. S. 1992. [intracellular effect of the ventral prostate in zinc deficient rats]. *[Chung-Hua i Hsueh Tsa Chih]* 49(4): 238-43.
- Gene** Huang, J. S., Mukherjee, J. J., Chung, T., Crilly, K. S., and Kiss, Z. 1999. extracellular calcium stimulates dna synthesis in synergism with zinc, insulin and insulin-like growth factor i in fibroblasts. *Vol. 266, No. 3, Pp. 943-951* European Journal Of Biochemistry
- In Vit** Huang, J. S., Mukherjee, J. J., and Kiss, Z. 1999. ethanol potentiates the mitogenic effects of sphingosine 1-phosphate by a zinc- and calcium-dependent mechanism in fibroblasts. *Archives of Biochemistry and Biophysics* 366(1): 131-8.
- Gene** Huang, Lei, Grammatikakis, N., and Toole, B. P. 1998. organization of the chick cdc37 gene. *Vol. 273, No. 6, Pp. 3598-3603* J. Biol. Chem.
- FL** Huang, Li-Ling and Wang, Guoo-Shyng. effects of dietary fibers and artificial synthetic

polysaccharides on apparent absorption of zinc and copper in rats. *Zhonghua Minguo Yingyang Xuehui Zazhi* (1996) 21(4): 395-408.

- Abstract** Huang, P. C., Corrigan, A., Smith, B., Bohdan, P., and Moreadith, R. cadmium resistance in cho mutants. *71ST ANNUAL MEETING OF THE AM. SOC. BIOL. CHEM. HELD WITH THE BIOPHYS. SOC., NEW ORLEANS, LA., USA, JUNE 1-6, 1980. FED PROC.* 39 (6). 1980. Abstract 398.
- In Vit** Huang, P. C., Smith, Betty, Bohdan, Patricia, and Corrigan, Alice. effect of zinc on cadmium influx and toxicity in cultured cho cells. *Biol. Trace Elem. Res.* (1980) 2(3): 211-20.
- Gene** Huang, R. P. and Adamson, E. D. 1993. characterization of the dna-binding properties of the early growth response-1 (egr-1) transcription factor: evidence for modulation by a redox mechanism. *DNA and Cell Biology* 12(3): 265-73.
- Unrel** Huang, R. P., Fan, Y., Ni, Z., Mercola, D., and Adamson, E. D. 1997. reciprocal modulation between sp1 and egr-1. *Journal of Cellular Biochemistry* 66(4): 489-99.
- Alt** Huang, S. X., McFall, M., Cegielski, A. C., and Kirkwood, R. N. 1999. effect of dietary zinc supplementation on escherichia coli septicemia in weaned pigs. *Swine Health and Production* 7(3): 109-111.
- Model** Huang, Shibin, Fan, Hongshen, and Liu, Qiang. observation on trace element metabolism of chronic renal failure model in rats. *Guangdong Weiliang Yuansu Kexue* (1995) 2(4): 21-23 .
- Nut def** Huang, Y. S., Cunnane, S. C., Horrobin, D. F., and Davignon, J. 1982. most biological effects of zinc deficiency corrected by .gamma.-linolenic acid (18:3.omega.6) but not by linoleic acid (18:2.omega.6). *Atherosclerosis (Shannon Irel.)* 41(2-3): 193-207.
- In Vit** Huang Yen-Hua, Luo Ching-Wei, Yu Lung-Chih, Chu Sin-Tak, and Chen Yee-Hsiung(A). 1995. the protein conformation and a zinc-binding domain of an autoantigen from mouse seminal vesicle. *Biophysical Journal* 69(5): 2084-2089.
- Fate** Huang Yude, Zhu GuoSheng, Lu GuoQuan, Qiuo KeXing, and Zhang JiuTao. 1995. evaluation of the apparent absorption rate of methionine-zn (met-zn) by holstein-friesian dairy cattle. *Animal Husbandry and Veterinary Medicine, China* 27(1): 10-11.
- Unrel** Huang, Z., Philippin, B., O'Leary, E., Bonventre, J. V., Kriz, W., and Witzgall, R. 1999. expression of the transcriptional repressor protein kid-1 leads to the disintegration of the nucleolus. *Journal of Biological Chemistry* 274(12): 7640-8.
- Nut def** Huber, A. M. and Gershoff, S. N. 1973. effect of zinc deficiency in rats on insulin release from the pancreas. *Journal of Nutrition* 103(12): 1739-44.
- Nut def** Huber, A. M. and Gershoff, S. N. effects of dietary zinc and calcium on the retention and distribution of zinc in rats fed semi purified diets. *Journal of Nutrition.* 100 (8). 1970 949-954.
- HHE** Huber, A M and Gershoff, S N. effects of dietary zinc on zinc enzymes in the rat. [human nutrition]. *J Nutr* Aug 1973 103 (8): 1175-1181. Ref.
- Nut def** Huber, A. M. and Gershoff, S. N. 1975. effects of zinc deficiency on the oxidation of retinol and ethanol in rats. *Journal of Nutrition* 105(11): 1486-90.
- Nut def** Huber, Agnes M. and Gershoff, Stanley N. effects of dietary zinc and calcium on the retention and distribution of zinc in rats fed semipurified diets. *J. Nutr.* (1970) 100(8): 949-54.

- Nut def** Huber, Agnes M. and Gershoff, Stanley N. effects of dietary zinc on zinc enzymes in the rat. *J. Nutr.* (1973) 103(8): 1175-81.
- Nut def** Huber, Agnes M. and Gershoff, Stanley N. effects of zinc deficiency on the oxidation of retinol and ethanol in rats. *J. Nutr.* (1975) 105(11): 1486-90.
- Abstract** Huber, K. L. and Cousins, R. J. interleukin-1-alpha induction of metallothionein genes in bone marrow in rats fed a zinc-sufficient or marginally deficient diet. *73RD ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, NEW ORLEANS, LOUISIANA, USA, MARCH 19-23, 1989. FASEB (FED AM SOC EXP BIOL) J.* 3 (3). 1989. A457.
- Nut def** Huber, Kirsten L. and Cousins, Robert J. zinc metabolism and metallothionein expression in bone marrow during erythropoiesis. *Am. J. Physiol.* (1993) 264(5, Pt. 1): E770-E775.
- Food** Huber, T. L., Laflamme, D. P., Medleau, L., Comer, K. M., and Rakich, P. M. 1991. comparison of procedures for assessing adequacy of dog foods. *Journal of the American Veterinary Medical Association* 199(6): 731-4.
- No COC** Huchzermeyer, F. W. 1972. (some poultry disease problems encountered in rhodesia.). *Deutsche Tierarztliche Wochenschrift* 79(No.8): 200-202.
- No Oral** Huerta, P., Galan, P., Teijon, J. M., and Ribas, B. increase of metallothionein and other proteins in thymus and spleen during chronic zinc administration. *Toxicol. Environ. Chem.* (1989) 25(1): 63-7.
- Nut def** Hughes, R. N. and Horsburgh, R. J. some behavioral effects of prenatal marginal zinc deficiency in young rats. *Nutr. Res. (N. Y.)* (1982) 2(4): 513-20.
- Bio Acc** Hui, A., Takekawa, J. Y., Baranyuk, V. V., and Litvin, K. V. 1998. trace element concentrations in two subpopulations of lesser snow geese from wrangel island, russia. *Arch Environ Contamin Toxicol* . 34(2): 197-203.
- Bio Acc** Hui, C. A. 1998. elemental contaminants in the livers and ingesta of four subpopulations of the american coot (*fulica americana*): an herbivorous winter migrant in san francisco bay. *Environmental Pollution* . 101(3): p321-329.
- Surv** Hui, Clifford A. metal and trace element burdens in two shorebird species at two sympatric wintering sites in southern california. *Environ. Monit. Assess.* (1998) 50(3): 233-247.
- No Dose** Hui, Clifford A. University of California Davis and Beyer, W. Nelson USGS Laurel MD. sediment ingestion of two sympatric shorebird species. *Sci Total Environ.* V224, N1-3, P227(7)
- Nut def** Hulych, M. P. and Onopriyenko, O. M. 1994. effect of retinol deficiency on balance of microelements regulating hcl secretion. *Likars'Ka Sprava* 0(1): 74-76.
- Food** Humphrey, P. A., Ashraf, M., and Lee, C. M. 1997. growth of trypanosomes in vivo, host body weight gains, and food consumption in zinc-deficient mice. *Journal of the National Medical Association* 89(1): 48-56.
- No Oral** Humphrey, P. A., Ashraf, M., and Lee, C. M. 1997. hepatic cells' mitotic and peritoneal macrophage phagocytic activities during trypanosoma muscoli infection in zinc-deficient mice. *Journal of the National Medical Association* 89(4): 259-67.
- Nut def** Humphrey, P. A., Lee, C. M., and Ashraf, M. 1994. changes in immunoglobulin levels in zinc-

deficient mice infected with trypanosoma musculi. *Journal of the National Medical Association* 86(8): 613-9.

- Abstract** Hunsaker, H. A., Twedt, D. C., Magne, M., and Allen, K. G. D. 1985. treatment of copper storage disease (wilson's disease) in bedlingtonterriers using n,n'-bis-(2-aminoethyl)-1,3-propane diamine(2,3,2-tetramine). (abstract). *Federation Proceedings* 44(3): 541.
- Nut def** Hunt, C. D., Halas, E. S., and Eberhardt, M. J. 1988. long-term effects of lactational zinc deficiency on bone mineral composition in rats fed a commercially modified luecke diet. *Biological Trace Element Research* 16(2): 97-113.
- No COC** Hunt, Curtiss D. dietary boron modified the effects of magnesium and molybdenum on mineral metabolism in the cholecalciferol-deficient chick. *Biol. Trace Elem. Res.* (1989) 22(2): 201-20.
- Alt** Hunt, D. M. and Clarke, R. metallo thionein and the development of the mottled disorder in the mouse. *BIOCHEM GENET. Biochemical Genetics.* 21 (11-12). 1983 (Recd. 1984). 1175-1194.
- CP** Hunt, D. M., Wake, S., Mercer, J., and Danks, D. M. metallothionein and the development of the inherited copper toxicosis of dogs. *KAGI, J. H. R. AND Y. KOJIMA (ED.). EXPERIENTIA SUPPLEMENTUM, VOL. 52. METALLOTHIONEIN II; SECOND INTERNATIONAL MEETING ON METALLOTHIONEIN AND OTHER LOW MOLECULAR WEIGHT METAL-BINDING PROTEINS, ZURICH, SWITZERLAND, AUGUST 21-24, 1985. XII+755P. BIRKHAUSER VERLAG AG: BASEL, SWITZERLAND; BOSTON, MASSACHUSETTS, USA. ILLUS. ISBN 3-7643-1804-X; ISBN 0-8176-1804-X. 0 (0). 1987. 705.*
- No COC** Hunt, E. G. and Keith J. O. 1962. pesticide-wildlife investigations in california - 1962. *Proc.2nd Annual Conf.on the Use of Agricultural Chemicals in California - A Summary of the Problems and Progress in Solving Them, University of California, Davis, CA.* 29
- HHE** Hunt, I. F., Murphy, N. J., Cleaver, A. E., Faraji, B., Swendseid, M. E., Browdy, B. L., Coulson, A. H., Clark, V. A., Settlege, R. H., and Smith, J. C. 1985. zinc supplementation during pregnancy in low-income teenagers of mexican descent - effects on selected blood-constituents and on progress and outcome of pregnancy. *American Journal Of Clinical Nutrition* 42(5): 815-828.
- CP** Hunt, J. R. and Johnson, L. K. the effect of dietary protein intake on zinc requirements and bone zinc in the growing rat. *Proceedings Of The North Dakota Academy Of Science.* Apr 1989. v. 43 p. 54.
- In Vit** Hunt, J. R., Johnson, P. E., and Swan, P. B. 1987. dietary conditions influencing relative zinc availability from foods to the rat and correlations with invitro measurements. *Journal Of Nutrition* 117(11): 1913-1923.
- In Vit** Hunt, J. R., Johnson, P. E., and Swan, P. B. 1989. the dynamic nature of zinc availability from foods invivo - implications for invitro methods. *Biological Trace Element Research* 19(1-2): 119-127.
- CP** Hunt, J. R., Johnson, P. E., and Swan, P. B. the effect of dietary zn before and after 65-zn administration on absorption and turnover of 65-zn. *Trace Elements In Man And Animals 6 / Edited By Lucille S. Hurley, ... [Et Al.].* p. 685-686.
- Fate** Hunt, J. R., Johnson, P. E., and Swan, P. B. 1987. influence of usual zinc intake and zinc in a meal on 65zn retention and turnover in the rat. *The Journal Of Nutrition.* 117(8): 1427-1433.
- Abstract** Hunt, J. R. and Larson, B. J. the effect of egg white protein on zinc retention in rats. *72ND*

ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, LAS VEGAS, NEVADA, USA, MAY 1-5, 1988. FASEB (FED AM SOC EXP BIOL) J. 2 (4). 1988. Abstract 2094.

- CP** Hunt, J. R., Zito, C. A., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. reduced bone mineral density in rats fed high dietary protein. <. Document Title>Trace Elements in Man and Animals - TEMA 8:Proceedings of the Eighth International Symposium on Trace Elements InMan and Animals. 1013-1014.
- Nut def** Hunt, Janet R. and Johnson, LuAnn K. dietary protein, as egg albumen: effects on bone composition, zinc bioavailability and zinc requirements of rats, assessed by a modified broken-line model. *J. Nutr.* (1992) 122(1): 161-9.
- Bio Acc** Hunt, Janet R., Johnson, Phyllis E., and Swan, Patricia B. effect of dietary zinc on 65-zinc absorption and turnover in rats. *Nutr. Res. (N. Y.)* (1989) 9(2): 161-71.
- Nut** Hunt, Janet R. and Larson, Betty J. meal protein and zinc levels interact to influence zinc retention by the rat. *Nutr. Res. (N. Y.)* (1990) 10(6): 697-705.
- Diss** Hunt, Janet Ross. 1987. factors affecting zinc retention in the rat. Avail.: Univ. Microfilms Int. Order No. DA8727419 From: Diss. Abstr. Int. B 1988, 48. 9. 118 pp.
- HHE** Hurd, R. W., Wilder, B. J., and Vanrinsvelt, H. A. 1983. valproate, birth-defects, and zinc.
- Rev** Hurley, L. S. 1981. teratogenic aspects of manganese, zinc, and copper nutrition. *Physiological Reviews*. 61(2): 249-295.
- Nut def** HURLEY, L. S. zinc in prenatal and neonatal nutrition. *PROC FL SYMP MICRONUTR HUM NUTR 1981* 47-54,1981
- CP** Hurley, L. S. and Cosens, G. reproduction and pre natal development in relation to dietary zinc level. *HOEKSTRA, W. G. ET AL. (ED.). TRACE ELEMENT METABOLISM IN ANIMALS, NO. 2. PROCEEDINGS OF THE SECOND INTERNATIONAL SYMPOSIUM. MADISON, WIS., U.S.A., JUNE 18-22, 1973. XXVI+775P. ILLUS. UNIVERSITY PARK PRESS: BALTIMORE, MD., U.S.A.; LONDON, ENGLAND. ISBN 0-8391-0696-3. 1974 516-518*
- Nut def** Hurley, L. S., Cosens, G., and Theriault, L. L. 1976. magnesium, calcium and zinc levels of material and fetal tissues in magnesium deficient rats. *Journal of Nutrition* 106(9): 1261-1264.
- Nut def** Hurley, L. S., Cosens, G., and Theriault, L. L. 1976. magnesium, calcium and zinc levels of maternal and fetal tissues in magnesium deficient rats. *Journal of Nutrition* 106(9): 1261-4.
- Prim** Hurley, L. S., Gershwin, M. E., and Golub, M. S. marginal zinc deprivation in pregnant monkeys and effects on offspring. *Trace Elements In Man And Animals : Tema 5 : Proceedings Of The Fifth International Symposium On Trace Elements In Man And Animals / Editors C.f. Mills, I. Bremner, & J.k. Chesters.* p. 197-200.
- CP** HURLEY, L. S., KEEN, C. L., LOENNERDAL, B., MARK-SAVAGE, P., and HACKMAN, R. trace elements, genetic factors, and drugs in developmental abnormalities. *TRACE ELEM METAB MAN ANIM PROC INT SYMP 4TH* 283-286,1982
- Abstract** Hurley, L. S., Keen, C. L., and Lonnerdal, B. changing molecular localization of zinc and copper in rat neo natal intestine and liver. *65TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ATLANTA, GA., USA, APRIL 12-17, 1981. FED PROC.* 40 (3 Part 2). 1981. 856.

- CP** Hurley, L. S., Keen, C. L., and Lonnerdal, B. copper in fetal and neo natal development. EVERED, D. AND G. LAWRENSON (ED.). CIBA FOUNDATION SYMPOSIUM, VOL. 79. BIOLOGICAL ROLES OF COPPER; MEETING, LONDON, ENGLAND, MARCH 11-13, 1980. VIII+343P. EXCERPTA MEDICA: AMSTERDAM, NETHERLANDS; ELSEVIER/NORTH-HOLLAND, INC.: NEW YORK, N.Y., USA. ILLUS. ISBN 90-219-4085-X; ISBN 0-444-90177-9. 0 (0). 1980 (Recd. 1981). P227-246.
- Rev** Hurley, L. S. and Lonnerdal, B. 1980. tryptophan, picolinic acid and zinc absorption: an unconvincing case [letter]. *Journal of Nutrition*. 110(12): 2536-8.
- Nut def** Hurley, L. S. and Mutch, P. B. pre natal and post natal development after transitory gestational zinc deficiency in rats. *Journal of Nutrition*. 103 (5). 1973 649-656.
- Nut def** HURLEY, L. S., SUCHER, K., STORY, D., and COSENS, G. interaction of dietary protein and zinc in the pregnant rat. *AM J CLIN NUTR* 26:R25,1973
- Nut def** Hurley, L. S. and Swenerton, H. 1971. lack of mobilization of bone and liver zinc under teratogenic conditions of zinc deficiency in rats. *Journal of Nutrition* 101(5): 597-603.
- Nut def** Hurley, L. S. JONUA, Dungan, D. D., Keen, C. L., and Lonnerdal, B. 1983. the effects of vitamin e on zinc deficiency teratogenesis in rats (alpha tocopherol). *The Journal Of Nutrition*. 113 (9): 1875-1877.
- CP** Hurley, Lucille S. 1974. zinc and its influence on development in the rat. *Clin. Appl. Zinc Metab. Proc. Int. Symp.* Meeting Date 1971, 57-75. Editor(s): Pories, Walter J.; Strain, William H.; Hsu, Jeng M. Publisher: Thomas, Springfield, Ill..
- Nut def** Hurley, Lucille S. zinc deficiency in the developing rat. *Amer. J. Clin. Nutr.* (1969) 22(10): 1332-9.
- CP** Hurley, Lucille S. and Cosens, Gladys. 1974. reproduction and prenatal development in relation to dietary zinc level. *Trace Elem. Metab. Anim. Proc. Int. Symp., 2nd* : Meeting Date 1973, 516-18. Editor(s): Hoekstra, W. G. Publisher: Univ. Park Press, Baltimore, Md..
- Nut def** Hurley, Lucille S., Cosens, Gladys, and Theriault, Linda L. magnesium, calcium and zinc levels of maternal and fetal tissues in magnesium deficient rats. *J. Nutr.* (1976) 106(9): 1261-4.
- In Vit** Hurley, Lucille S., Duncan, John R., Sloan, Martin V., and Eckhert, Curtis D. zinc-binding ligands in milk and intestine: a role in neonatal nutrition? *Proc. Natl. Acad. Sci. U. S. A.* (1977) 74(8): 3547-9 .
- Nut def** Hurley, Lucille S., Dungan, Donna D., Keen, Carl L., and Lonnerdal, Bo. the effects of vitamin e on zinc deficiency teratogenesis in rats. *J. Nutr.* (1983) 113(9): 1875-7
- Prim** Hurley, Lucille S., Gershwin, M. E., and Golub, Mari S. 1985. marginal zinc deprivation in pregnant monkeys and effects on offspring. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th* : Meeting Date 1984, 197-200. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK..
- Nut def** Hurley, Lucille S., Gordon, Philip, Keen, Carl L., and Merkhofer, Lance. circadian variation in rat plasma zinc and rapid effect of dietary zinc deficiency. *Proc. Soc. Exp. Biol. Med.* (1982) 170(1): 48-52 .
- Nut def** Hurley, Lucille S., Gowan, Jean, and Swenerton, Helene. teratogenic effects of short-term and transitory zinc deficiency in rats. *Teratology* (1971) 4(2): 199-204.

- Rev** Hurley, Lucille S. and Loennerdal, Bo. tryptophan, picolinic acid and zinc absorption: an unconvincing case. zinc absorption in rats fed a low-protein diet and a low-protein diet supplemented with tryptophan or picolinic acid. comments. *J. Nutr.* (1980) 110(12): 2536-8.
- Nut def** Hurley, Lucille S. and Mutch, Patricia B. prenatal and postnatal development after transitory gestational zinc deficiency in rats. *J. Nutr.* (1973) 103(5): 649-56.
- Nut def** Hurley, Lucille S. and Shrader, Ruth E. abnormal development of preimplantation rat eggs after three days of maternal dietary zinc deficiency. *Nature (London)* (1975) 254(5499): 427-9.
- Nut def** Hurley, Lucille S. and Swenerton, Helene. congenital malformations resulting from zinc deficiency in rats. *Proc. Soc. Exp. Biol. Med.* (1966) 123(3): 692-6.
- Nut def** Hurley, Lucille S. and Swenerton, Helene. lack of mobilization of bone and liver zinc under teratogenic conditions of zinc deficiency in rats. *J. Nutr.* (1971) 101(5): 597-603.
- Nut def** Hurley, Lucille S. and Tao, Shyy-Hwa. alleviation of teratogenic effects of zinc deficiency by simultaneous lack of calcium. *Amer. J. Physiol.* (1972) 222(2): 322-5.
- Acu** Hurley, S. and Fenton, M. B. 1980. ineffectiveness of fenthion, zinc phosphate, ddt and two ultrasonic rodent repellents for control of populations of little brown bats (*Myotis lucifugus*). *Bull Environ Contam Toxicol.* 25: 503-507.
- Food** Hurrell, Richard F., Ribas, Sandra, and Davidsson, Lena. nfe3+ edta as a food fortificant: influence on zinc, calcium and copper metabolism in the rat. *Br. J. Nutr.* (1994) 71(1): 85-93.
- CP** Hus, Jeng M. and Anthony, William L. 1974. incorporation of glycine-2-14c into skin collagen in zinc-deficient rat. *Trace Elem. Metab. Anim. Proc. Int. Symp., 2nd* : Meeting Date 1973, 733-5. Editor(s): Hoekstra, W. G. Publisher: Univ. Park Press, Baltimore, Md..
- Abstract** Huskins, K. R. and Dunn, M. F. activation kinetics of 7s nerve growth factor estero peptidase reveal 2 classes of zinc ii binding affinities. 66TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, NEW ORLEANS, LA., USA, APRIL 15-23, 1982. *FED PROC.* 41 (3). 1982. Abstract 2191.
- Diss** Hussein, A. S. 1987. *The Influence of High Levels of Dietary Aluminum on Calcium and Phosphorus Metabolism and Performance of Chickens and Japanese Quail*
- No COC** Hussein, A. S., Cantor, A. H., and Johnson, T. H. 1988. use of high levels of dietary aluminum and zinc for inducing pauses in egg production of japanese quail. *POULT SCI* 67(8): 1157-1165.
- Rev** Hussein, A. S. Department of Animal Production Faculty of Agricultural Sciences United Arab Emirates University P. O. Box 17555 Al-Ain United Arab Emirates. 1996. induced moulting procedures in laying fowl. *World's Poultry Science Journal.* V. 52(2) P. 175-187
- Nut def** Hussein, K., Goldberg, M., Septier, D., and Carreau, J. P. 1986. histochemical-investigations on the effect of a zinc-deficient diet on the forming rat incisor. *Journal Of Dental Research* 65: 555.
- FL** Hussein, T. H., Yehya, N. S., and Al-Sagh, A. S. Mosul Univ. Coll. of Agric. and Forestry Iraq. 1991. force molting methods and performance studies of recycled hens. <original> dira:sat> al-h"a:lat> al-'inta:j"iyyat> lidaj"a:j" al-bai:d* ba3d 'ij"ra:' al-qalas" al-'ij"ba:ry biwasa:'il muh*talifat>. *Mij"Alat> Zira:3at> Al-Ra:Fidi:n.* <Subtitle> *Mesopotamia Journal of*

- Nut** Hutagalung, R. I., Jalaludin, Syed, and Choo, Chang Chen. evaluation of agricultural products and by-products as animal feeds. ii. effects of levels of dietary cassava (tapioca) leaf and root on performance, digestibility, and body composition of broiler chicks. *Malays. Agric. Res.* (1974) 3(1): 49-59.
- CP** Hutcheson, J. P., Greene, L. W., Carstens, G. E., and Byers, F. M. effects of zeranol and two dietary calcium phosphorus levels on physical characteristics and mineral status of metacarpal bones in wether lambs. *83RD ANNUAL MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE SOUTHERN SECTION, FORT WORTH, TEXAS, USA, FEBRUARY 3-6, 1991. J ANIM SCI.* 69 (Suppl. 1). 1991. 59-60. CP.
- Food** Hutjens, M. F. 1991. feed additives. *Veterinary Clinics of North America, Food Animal Practice* 7(2): 525-540.
- Nut** Hutton, C. W. and Hayesdavis, R. B. 1983. assessment of the zinc nutritional-status of selected elderly subjects. *Journal Of The American Dietetic Association* 82(2): 148-153.
- Bio Acc** Hutton, M. accumulation of heavy metals and selenium in three sea bird species from the united kingdom. *Environ. Pollut.* Ser. A (1981): 26(2), 129-45.
- Mix** Huxley, H. G. and Leaver, A. G. effect of different levels of dietary zinc and calcium upon the zinc concentration of the rat femur and incisor. *Arch. Oral Biol.* (1966) 11(12): 1377-44.
- Drug** Huyghebaert, G. and Groote, G. de. 1997. the bioefficacy of zinc bacitracin in practical diets for broilers and laying hens. *Poultry Science* 76(6): 849-856.
- Nut def** Hwang, D. H., Chanmugam, P., and Wheeler, C. 1984. zinc deficiency affects neither platelet arachidonic acid metabolism nor platelet aggregation in rats. *The Journal Of Nutrition.* 114 (2): 398-403.
- Nut def** Hwang, Daniel H., Chanmugam, Prithiva, and Wheeler, Catherine. zinc deficiency affects neither platelet arachidonic acid metabolism nor platelet aggregation in rats. *J. Nutr.* (1984) 114(2): 398-403.
- Unrel** Hwang, S. G., Kung, Z. Y., and Tsai, D. C. 1979. investigation and controlling study of squirrel damage to the experimental plantation at lu-kuei branch. *Bulletin, Taiwan Forestry Research Institute* (318): ii + 17 pp.
- No COC** Hygnstrom, S. E. McDonald P. M. and Virchow D. R. 1998. efficacy of three formulations of zinc phosphide for managing black-tailed prairie dogs. *Int.Biodeterior.Biodegrad.* 42(2/3): 147-152.
- Nut** Hynd, P. I. 2000. the nutritional biochemistry of wool and hair follicles. *Animal Science* 70(2): 181-195.
- Phys** Hynes, M., Stone, D. M., Dowd, M., Pitts-Meek, S., Goddard, A., Gurney, A., and Rosenthal, A. 1997. control of cell pattern in the neural tube by the zinc finger transcription factor and oncogene gli-1. *Neuron* 19(1): 15-26.
- FL** Hyoung, J. H. and Lee, C. E. 1991. studies on diazinon-induced inhibition of skeletal mineralization in chick embryo. *Research Reports of the Rural Development Administration, Veterinary* 33(2): 41-60.

- Unrel** Iatridou, H., Foukaraki, E., Kuhn, M. A., Marcus, E. M., Haugland, R. P., and Katerinopoulos, H. E. the development of a new family of intracellular calcium probes. *Cell Calcium* (1994) 15(2): 190-8 .
- CP** Ibanez, C. the use of probiotics and zinc bacitracin in the diet of commercial layers. *79TH ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC., BLACKSBURG, VIRGINIA, USA, MAY 1990. POULT SCI.* 69 (Suppl. 1). 1990. 65.
- Diss** Ibnonghazala, T. 1984. [effects of fatty acid and interactions between zinc and dietary fat on lipid and mineral metabolism of rat]. <original> effets des acides gras alimentaires et interactions entre le zinc et les lipides alimentaires sur le metabolisme lipidique et mineral chez le rat. 97 P.
- Nut** Ibnouf, F. O. and El-Zubeir, E. A. 1992. the effect of dietary tannins on incidence of leg abnormalities in chicks fed different calcium:phosphorus ratios. *Sudan Journal of Animal Production* 5: 71-79.
- Diss** Ibrahim, M. R. M. 1986. effect of dietary protein, zinc and calcium levels and their interactions on growing rabbit performance [egypt]. 153 P.
- FL** Ichino, R. 1985. [a histo-pathological and clinico-pathological study of pulp response to a posterior composite resin restorations]. *Shika Gakuho* 85(3): 255-99.
- Nut def** Ideguchi, Hiroshi, Dai, Wenyu, Nishida, Ikuko, Morimoto, Akiko, and Nishioka, Takahiro. the effect of zinc on condylar cartilage at growth stage. *Kyushu Shika Gakkai Zasshi* (1999) 53(4): 472-492.
- Unrel** Idei, Yasuo. 1976. experimental study on zinc metabolism in wound healing. *Kansai Ika Daigaku Zasshi* 28(4): 772-804 .
- Gene** Ido Akio, Miura Yutaka, Watanabe Masahiko, Sakai Masaharu, Inoue Yoshiro, Miki Toru, Hashimoto Tomoko, Morinaga Tomonori, Nishi Shinzo, and Tamaoki Taiki(A). 1996. cloning of the cdna encoding the mouse atbf1 transcription factor. *Gene (Amsterdam)* 168(2): 227-231.
- Nut def** Ientile, R., Cannavo, G., and Fabiano, C. 1995. alterations of retina polyamine levels, following perinatal zinc deficiency. *Vol. 17, No. 3, Pp. 195-202 Neurosci. Res. Commun.*
- Nut def** Ientile, Riccardo, Cannavo, Giuseppe, and Fabiano, Caterina. alternations of retina polyamine levels, following perinatal zinc deficiency. *Neurosci. Res. Commun.* (1995) 17(3): 195-202.
- Bio Acc** Igawa, Takahiko. determination of mineral contents in chicken liver. *Kachiku Hoken Eisei Gijutsu Kenkyukai Kaiho* (1977) : 25, 97-9.
- CP** Ignacio Monreal J, Monreal, A. J., Da Cunha Ferreira R M C, and Arias, H. relationship of zinc to growth and development. *SUNSHINE, I. (ED.). RECENT DEVELOPMENTS IN THERAPEUTIC DRUG MONITORING AND CLINICAL TOXICOLOGY; SECOND INTERNATIONAL CONFERENCE ON TDM (THERAPEUTIC DRUG MONITORING)-TOXICOLOGY, BARCELONA, SPAIN. XII+791P. MARCEL DEKKER, INC.: NEW YORK, NEW YORK, USA; BASEL, SWITZERLAND. ILLUS. ISBN 0-8247-8586-X. 0 (0). 1992. 627-633.*
- No Oral** Ikeda, Minoru, Ikui, Akihiro, and Tomita, Hiroshi. changes in serum and leukocyte zinc levels in rabbits treated with zinc chelating agents. *Biomed. Res. Trace Elem.* (1999) 10(1): 43-52.
- IMM** Ikeda Mitsunori, Ogata Fusahiro, Curtis Sylvia W, Lubahn Dennis B, French Frank S, Wilson Elizabeth M, and Korach Kenneth S(A). 1993. characterization of the dna-binding domain of the mouse uterine estrogen receptor using site-specific polyclonal antibodies. *Journal of Biological*

Chemistry 268(14): 10296-10302.

- Org Met** Ikeda, Shinjiro. effect of zinc phosphide on coturnix coturnix japonica. *Ringyo Shikenjo Kenkyu Hokoku* (1971) : No. 238, 141-8.
- HHE** Ikeda, T., Higashi, A., Matsukura, M., and Matsuda, I. 1983. hair copper and zinc concentrations in handicapped-children treated with anti-convulsants. *Developmental Pharmacology And Therapeutics* 6(6): 381-387.
- FL** Ikeda, Y. 1985. [a histo-pathological and clinico-pathological study of pulp response to a microfilled resin restoration system using a bonding agent]. *Shika Gakuho* 85(3): 301-38.
- QAC** Ikegaya Yuji, Saito Hiroshi, and Matsuki Norio(A). 1994. involvement of carbon monoxide in long-term potentiation in the dentate gyrus of anesthetized rats. *Japanese Journal of Pharmacology* 64(3): 225-227.
- FL** Il'in, V. S. and Polikarpova, L. I. 1967. [the effect of hydrocortisone and insulin on the synthesis of alanine-alpha-ketoglutarate and aspartate-alpha-ketoglutarate transaminase in rat liver]. <original> vliianie gidrokortizona i insulina na sintez alanin-alpha-ketogliutarat- i aspartat-alpha-ketogliutarattransaminaz pecheni krysa. *Voprosy Meditsinskoi Khimii* 13(3): 278-82.
- FL** Il'ina, T. A., Zhuravlev, A. I., and Pontyushenko, N. T. 1980. buffering capacity as a quality criterion for boar semen. *Sel'Skokhozyaistvennaya Biologiya* 15(5): 744-747.
- BioX** Ilback, N. G., Friman, G., Crawford, D. J., and Neufeld, H. A. 1991. effects of training on metabolic responses and performance capacity in streptococcus pneumoniae infected rats. *Medicine and Science in Sports and Exercise* 23(4): 422-7.
- CP** Iles, K. E(A), Phillips, J. P., and Bray, T. M. 1996. the effect of dietary copper manipulation and pancreatic cuzn on the susceptibility to iddm. *FASEB Journal* 10(3): A742.
- Nut** Illenseer, M. 1994. preileal digestibility of oat, potato and cassava diets in horses. 129 pp.
- Nut def** Ilyas, A., Funaba, M., Ashida, K., Yano, H., and Kawashima, R. effects of zinc deficiency on bone physical properties and trace minerals content in rats. *Biomed. Res. Trace Elem.* (1992) 3(2): 159-60.
- BioX** Imai, K., Nikai, T., Sugihara, H., and Ownby, C. L. 1989. hemorrhagic toxin from the venom of agkistrodon bilineatus (common cantil). *International Journal of Biochemistry* 21(6): 667-73.
- Drug** Imura, Nobumasa, Naganuma, A., Satoh, M., and Koyama, Y. 1987. induction of renal metallothionein allows increasing dose of an extensively used antitumor drug, cis-diamminedichloroplatinum. *Experientia Suppl.* 52: (Metallothionein 2), 655-60 .
- Unrel** Indo, Y., Nagata, N., Higashi, A., Matsuda, I., Kashiwabara, N., and Nakashima, I. 1985. effects of dietary zinc deficiency on hepatic ornithine carbamoyltransferase and alcohol dehydrogenase activities in rats. *Journal of Pediatric Gastroenterology and Nutrition* 4(2): 268-73.
- Unrel** Indo, Yasuhiro, Nagata, Noriyuki, Higashi, Akimasa, Matsuda, Ichiro, Kashiwabara, Norio, and Nakashima, Ichiro. effects of dietary zinc deficiency on hepatic ornithine carbamoyltransferase and alcohol dehydrogenase activities in rats. *J. Pediatr. Gastroenterol. Nutr.* (1985) 4(2): 268-73.
- No Tox** Indritz, A. N. and Hegarty, P. V. 1980. problems in the choice of a representative bone for mineral analysis: evidence from five bones of rats at two stages of development. *Journal of*

Anatomy 131(Pt 2): 317-20.

- Drug** Ingram, D. R., Wilson, H. R., Nesbeth, W. G., Beane, B. L., and Douglas, C. R. 1984. sodium chloride requirement of bobwhite quail chicks. *Poultry Science* 63(9): 1837-1840.
- Nut def** Iniesta, M. P. and Ribas, B. 1989. isolation of iron-zinc-copper-metallothionein after ironadministration. 1212-1219.
- In Vit** Iniguez, C., Casas, J., and Carreres, J. 1978. effects of zinc deficiency on the chick embryo blastoderm. *Acta Anatomica* 101(2): 120-9.
- Prim** Inokoshi, S., Shimada, Y., Fujitani, M., Otsuki, M., Shono, T., Onoe, N., Morigami, M., and Takatsu, T. 1995. monkey pulpal response to adhesively luted indirect resin composite inlays. *Operative Dentistry* 20(3): 111-8.
- No COC** Inoue, Tomoaki and Maitani, Takeshi. effect of copper on rats . (ii). effect of peroral administration. *Kyoto-Fu Eisei Kogai Kenkyusho Nenpo (1985)* : 30, 53-9 .
- Gene** Inukai, T., Inaba, T., Ikushima, S., and Look, A. Th. 1998. the ad1 and ad2 transactivation domains of e2a are essential for the antiapoptotic activity of the chimeric oncoprotein e2a-hlf. *Vol. 18, No. 10, Pp. 6035-6043 Molecular And Cellular Biology*
- FL** Iovchev, Nedelcho, Aleksiev, Aleksi, and Krusteva, Elena. effect of some trace elements on the weight development and feed cost of broiler chickens . vi. effect of zinc. *Zhivotnovud. Nauki (1971)* 8(2): 73-8.
- Nut def** Iqbal, M. 1971. activity of alkaline phosphatase and carbonic anhydrase in male and female zinc-deficient rats. *Enzyme* 12(1): 33-40.
- No Oral** Irato, P., Sturniolo, G. C., Giacon, G., Magro, A., D'Inca, R., Mestriner, C., and Albergoni, V. effect of zinc supplementation on metallothionein, copper, and zinc concentration in various tissues of copper-loaded rats. *Biol. Trace Elem. Res. (1996)* 51(1): 87-96.
- Unrel** Iribe, Kazuo, Buijten, Jan C., Rydberg, Ulf, and Tsukamoto, Shojiro. effects of the long-term administration of trace metal ions and ethanol on alcohol and aldehyde dehydrogenase activities in rat liver preparations. *Arukoru Kenkyu (1978)* 13(3): 200-6.
- Drug** Irino, Mika, Yasuhira, Kimio, and Takeda, Toshio. d-penicillamine toxicity in mice . ii. concentrations of copper, zinc and iron related to development of toxicity. *Toxicol. Appl. Pharmacol. (1982)* 63(1): 1-12.
- No Oral** Iriyama, K., Mori, T., Takenaka, T., Teranishi, T., and Mori, H. effect of serum zinc level on amount of collagen-hydroxyproline in the healing gut during total parenteral nutrition: an experimental study (in dogs). *Jpen, Journal Of Parenteral And Enteral Nutrition.* Sept/Oct 1982. v. 6 (5) p. 416-420. ill.
- Nut def** Iriyama, Keiji, Mori, Takao, Takenaka, Takumi, Teranishi, Tadashi, and Suzuki, Hiroshi. collagen-hydroxyproline in the gut of zinc-deficient dogs. *Mie Med. J. (1980)* 30(1): 1-5.
- Gene** Irving Carol, Nieto, M. Angela, Dasgupta Romita, Charnay Patrick, and Wilkinson David G(A). 1996. progressive spatial restriction of sek-1 and krox-20 gene expression during hindbrain segmentation. *Developmental Biology* 173(1): 26-38.
- Gene** Isaac, A., Sargent, M. G., and Cooke, J. 1997. control of vertebrate left-right asymmetry by a snail-related zincfinger gene. *Science (Washington)* 275(5304): 1301-1304 .

- FL** ISAEV, M. A., MASKALEVA, Z. Z., SHARAEV, P. N., and BOGDANOV, N. G. study of the effect of vitamin c and zinc on the toxic action of cadmium. *VOPR PITAN*; 0 (3). 1986. 73-74.
- Unrel** Iseki, M. cryptosporidium-felis new-species protozoa eimeriorina from the domestic cat. *JPN J PARASITOL. Japanese Journal of Parasitology*. 28 (5). 1979. 285-308.
- CP** Isfaoun, A., Bureau, F., Ait-Oukhatar, N., Arhan, P., and Bougle, D. 1996. metabolic interactions between iron and zinc in young rats. *Archives of Physiology and Biochemistry* 104(4): D113.
- Bio Acc** Isfaoun, A., Bureau, F., Mouly-Boudey, M., Drosdowsky, M., Arhan, P., and Bougle, D. relationships between iron and zinc metabolism. predictive value of digestive absorption on tissue storage. *J. Trace Elem. Med. Biol.* (1997) 11(1): 23-27 .
- CP** Ishibashi Takehiko, Eyadan Juanito A, Narita Makiko, and Moritomo Yasuo. 1993. morphology and distribution of langerhans cells in the epithelium of the digestive and reproductive tracts of cattle. *Proceedings of School of Agriculture Kyushu Tokai University* 12(0): 63-71.
- Gene** ISHIDO, M., HOMMA, S. T., LEUNG, P. S., and TOHYAMA, C. cadmium-induced dna fragmentation is inhibitabile by zinc in porcine kidney llc-pk1 cells. *LIFE SCIENCES*; 56 (17). 1995. 351-356.
- Nut def** Ishii, K., Sato, M., Akita, M., and Tomita, H. 1999. localization of zinc in the rat submandibular gland and the effect of its deficiency on salivary secretion. *Annals of Otology, Rhinology, and Laryngology* 108(3): 300-8.
- In Vit** Ishikawa, Yoshinori, Wu, Licia N. Y., Valhmu, Wilmot B., and Wuthier, Roy E. fetuin and alpha-2hs glycoprotein induce alkaline phosphatase in epiphyseal growth plate chondrocytes. *J. Cell. Physiol.* (1991) 149(2): 222-34.
- No Oral** Ishiyama, H., Ogino, K., Sato, M., Ogura, M., Dan, S., and Hobara, T. 1997. histopathological changes induced by zinc hydroxide in rat lungs. *Experimental and Toxicologic Pathology* 49(3-4): 261-6.
- Diss** Iskander, H. B. 1986. studies on some physio-chemical factors affecting the conception rate in cattle [egypt]. 82 P.
- FL** Ismail, A. A., Foda, M. S., and Khorshid, M. A. purification and properties of rennin-like enzyme from aspergillus-ochraceus. *ZENTRALBL BAKTERIOL PARASITENKD INFEKTIONSKR HYG ZWEITE NATURWISS ABT MIKROBIOL LANDWIRTSCH TECHNOL UMWELTSCHUTZES. Zentralblatt Fuer Bakteriologie Parasitenkunde Infektionskrankheiten Und Hygiene Zweite Naturwissenschaftliche Abteilung Mikrobiologie Der Landwirtschaft Der Technologie Und Des Umweltschutzes*. 133 (4). 1978. 321-328.
- CP** Israel David I(A) and Kaufman Randal J. 1993. dexamethasone negatively regulates the activity of a chimeric dihydrofolate reductase/glucocorticoid receptor protein. *Proceedings of the National Academy of Sciences of the United States of America* 90(9): 4290-4294.
- Nut def** Issoual, D., Mallet, B., Bernard, J. P., and Laugier, R. 1991. effects of zinc and copper deficiency associated with protein or lipid deficiency on rat exocrine pancreatic secretion. *Pancreas* 6(3): 330-40.
- CP** Issoual, D., Mallet, B., and Laugier, R. alterations of pancreatic exocrine secretion induced by zinc zinc and lipid or zinc and protein-deficient diet. *XIXTH MEETING OF THE EUROPEAN PANCREATIC CLUB, MARSEILLE, FRANCE, SEPTEMBER 3-5, 1987. DIGESTION*. 38 (1). 1987. 26.

- Unrel** Istasse, L., Chapaux, P., Hanzen, C., Antoine, O., Losson, B., Kafidi, N., Leroy, P., and Bienfait, J. M. influence of nutrition and management on milk production and reproduction in dairy herds 1. design and results. *Annales De Medecine Veterinaire*. 134 (1). 1990. 27-34.
- HHE** Istfan, N. W., Janghorbani, M., and Young, V. R. 1983. absorption of stable zn-70 in healthy-young men in relation to zinc intake. *American Journal Of Clinical Nutrition* 38(2): 187-194.
- FL** Istomina, N. A. effect of copper compounds on calf growth and assimilation of diet nutrients. *DOKL VSES ORDENA LENINA ORDENA TRUD KRASNOGO ZNAMENI AKAD S-KH NAUK IM VI LENINA. Doklady Vsesoyuznoi Ordena Lenina i Ordena Trudovogo Krasnogo Znameni Akademii Sel'Skokhozyaistvennykh Nauk Imeni VI Lenina*. 0 (2). 1980. 43-45.
- No Oral** Ito, A., Ojima, K., Kawamura, K., Ichinose, N., Layrolle, P., Hayashi, K., and Tateishi, T. 1999. zinc-releasing calcium phosphate ceramics stimulating bone formation. *Bioceram. Proc. Int. Symp. Ceram. Med.* 12: 567-570.
- No Oral** Ito, Atsuko, Usuki, Hazime, Shimizu, Takeshi, Kawata, Fumio, and Ito, Kinji. experimental studies of toxicological aspect of zinc on changes in liver. *Nippon Hoigaku Zasshi (1985)* 39(4): 326-30.
- Food** Ito, M., Tanaka, T., and Suzuki, Y. 1990. effect of n-(3-aminopropionyl)-l-histidinato zinc (z-103) on healing and hydrocortisone-induced relapse of acetic acid ulcers in rats with limited food-intake-time. *Japanese Journal of Pharmacology* 52(4): 513-21.
- Org Met** Ito, Y., Miyashita, M., Takaoka, M., and Tanaka, I. laboratory evaluation on the effectiveness of a new acute rodenticide pyriminyl to albino rats and mice. *JPN J SANIT ZOOL. Japanese Journal of Sanitary Zoology*. 28 (4). 1977 (Recd 1978) 349-354.
- HHE** Itoh, K., Itoh, Y., and Frank, M. B. protein heterogeneity in the human ro-ssa ribonucleoproteins the 52-kd and 60-kd ro-ssa autoantigens are encoded by separate genes. *J CLIN INVEST. Journal of Clinical Investigation*. 87 (1). 1991. 177-186.
- No Oral** Itoh Norio, Fujita Yuki, Nakanishi Hirokumi, Kawai Yuichi, Mayumi Tadanori, Hwang Gab Soo, Min Kyon-Son, Onosaka Satomi, Muto Norio, and Tanaka Keiichi(A). 1996. binding of cd to metallothionein in the placenta of cd-treated mouse. *Journal of Toxicological Sciences* 21(1): 19-27.
- Nut def** Itoh T(A) and Saito, T. 2000. effect of zinc deficiency on the response of immobilization stress for the adult rat. *Trace Elements and Electrolytes* 17(2): 76-81.
- Unrel** Itoh Toshihiro(A), Saito Takeshi, Fujimura Morihito, Watanabe Sonoyo, and Saito Kazuo. 1993. restraint stress-induced changes in endogenous zinc release from the rat hippocampus. *Brain Research* 618(2): 318-322.
- Nut def** Itokawa, Y. 1987. tissue minerals of magnesium-deficient rats with thiamine deficiency and excess. *Magnesium* 6(1): 48-54.
- Nut def** Itokawa, Yoshinori. tissue minerals of magnesium-deficient rats with thiamine deficiency and excess. *Magnesium (1987)* 6(1): 48-54.
- Mix** Ivan, M. and Grieve, C. M. effects of zinc copper and manganese supplementation of high concentrate ration on gastro intestinal absorption of copper and manganese in holstein calves. *Journal of Dairy Science*. 59 (10). 1976 1764-1768.
- FL** Ivandija, L. 1997 . fattening performance of broilers in relation to the source and quantity of

added zinc. *Praxis Veterinaria (Zagreb)* 45(3): 267-274.

- FL** Ivandija, L. 1994. prevention of unfavourable effects related to stress and infections in calves by addition of some trace minerals and vitamins in amounts greater than usually present in the feed. *Krmiva* 36(4): 185-193.
- FL** Ivanov, Yu. F., Kartsova, S. V., and Ivanova, V. Yu. 1986. effect of a complex of the principal trace elements on some biological and physiological indicators of growth and development in mink. *<document title>povyshenie effektivnosti zhivotnovodstva kalininskoi oblasti.* 37-41.
- FL** Ivanova, L., Donchev, N., and Mechkueva, L. effect of zinc-enriched diet on the distribution of zinc and copper in cadmium intoxication. *Khig. Zdraveopaz. (1990)* 33(3): 55-62.
- FL** Ivanova, L. and Mechkueva, L. effect of zinc enriched diet on the content and distribution of cadmium in rats perorally treated with cadmium. *Khig. Zdraveopaz. (1990)* 33(2): 79-83.
- No Dose** Ivanova, Ljudmila, Adjarov, Dimtcho, Kerimova, Milka, and Tzachev, Kamen. effect of starvation and undernutrition on zinc distribution in rats. *J. Clin. Biochem. Nutr. (1997)* 22(2): 73-76.
- Unrel** Ivanovic, V. and Santini, A. 1989. rate of formation of tertiary dentin in dogs' teeth in response to lining materials. *Oral Surgery, Oral Medicine, and Oral Pathology* 67(6): 684-8.
- Phys** Iverson, B. L., Iverson, S. A., Roberts, V. A., Getzoff, E. D., Tainer, J. A., Benkovic, S. J., and Lerner, R. A. metalloantibodies. *SCIENCE (WASHINGTON D C). SCIENCE (Washington D C).* 249 (4969). 1990. 659-662.
- In Vit** Iwami, K., Dohi, Y., and Moriyama, T. effect of cadmium on the bone formation in cultured fetal rat calvaria. *Toxicol Environ Chem* 1990;27(1-3):105-11
- FL** Iwanska, S., Strusinska, D., and Pysera, B. Akademia Rolniczo-Techniczna Olsztyn Poland. 1992. effect of dietary beta-carotene and a, d3 and e vitamins on mineral metabolism in calves. *<original> wplyw beta-karotenu i witamin a, d3 i e na wykorzystanie skladnikow mineralnych z dawki pokarmowej stosowanej w zywieniu cielat.* *Acta Academiae Agriculturae Ac Technicae Olstenensis. Zootechnica. (No.36) P.* 35-46
- Nut def** Iwata, T., Incefy, G. S., Tanaka, T., Fernandes, G., Menendez-Botet, C. J., Pih, K., and Good, R. A. circulating thymic hormone levels in zinc deficiency. *Cellular Immunology.* 47 (1). 1979. 100-105.
- Unrel** Iyer, R. N. and Schmidt, W. E. observations on the direct electrochemistry of bovine copper-zinc superoxide dismutase. *Bioelectrochemistry and Bioenergetics.* 27 (3). 1992. 393-404.
- Nut def** Izumi, Hiroshi, Mori, Hiroshi, Uchiyama, Taro, Kuwazuru, Shoko, Ozima, Yuuki, Nakamura, Ikuko, and Taguchi, Shigeru. sensitization of nociceptive c-fibers in zinc-deficient rats. *Am. J. Physiol. (1995)* 268(6, Pt. 2): R1423-R1428.
- FL** Izumo, Y. and Ogata, H. biochemical states of zinc incorporated under the form of zinc-65 in the liver of mice irradiated with a sublethal dose of gamma-rays. *Comptes Rendus Des Seances De La Societe De Biologie Et De Ses Filiales.* 183 (6). 1989 (1990). 564-570.
- Nut def** Jackl, G. A. and Reidel, G. 1991. chromatographic analysis of the soluble cadmium-109 and zinc-65 binding compounds of the intestinal contents and the feces of the rat. *Trace Elem. Man Anim. 7: Monogr. Proc., Round Tables Discuss. Int. Symp., 7th : Meeting Date 1990, 26-19-26/20.* Editor(s): Momcilovic, Berislav. Publisher: Inst. Med. Res. Occup. Health Univ. Zagreb,

Zagreb, Yugoslavia..

- Nut def** Jackson, A. J. and Schumacher, H. J. the teratogenic activity of a thalidomide analog em-12 2-2 6 di oxopiperiden-3-yl phthalimidine in rats on a low zinc diet. *Teratology*. 19 (3). 1979. 341-344.
- Nut def** Jackson, A. J. and Schumacher, H. J. the teratogenic activity of a thalidomide analog em12 in rats on a low-zinc diet. *Teratology* June 1979. v. 19 (3) p. 341-344. ill.
- Nut def** Jackson, Andre J. and Schumacher, Herbert J. the teratogenic activity of a thalidomide analog (em12) in rats on a low-zinc diet. *Teratology* (1979) 19(3): 341-4.
- Bio Acc** Jackson, L. S. and Lee, K. 1988. chemical forms of iron, calcium, magnesium and zinc in coffee and rat diets containing coffee. *Journal Of Food Protection*. 51(11): 883-886.
- Unrel** Jackson, Lauren S. and Lee, Ken. chemical forms of iron, calcium, magnesium and zinc in coffee and rat diets containing coffee. *J. Food Prot.* (1988) 51(11): 883-6 .
- In Vit** Jackson, M. J., Holt, D., Webb, M., and Carter, N. D. 1986. physiological zinc-binding proteins of medium molecular weight in the rat gut. *British Journal of Nutrition* 55(2): 369-77.
- No Oral** Jackson, M. J., Jones, D. A., and Edwards, R. H. 1981. zinc absorption in the rat. *British Journal of Nutrition* 46(1): 15-27.
- Org Met** Jackson, W. B., Spear, P. J., and Wright, C. G. resistance of norway rats to anticoagulant rodenticides confirmed in the united states. *Pest Control*; 39(9): 13-4 1971; (REF:2)
- Unrel** Jacob, J. M. and Robbins, N. 1990. age differences in morphology of reinnervation of partially denervated mouse muscle. *Journal of Neuroscience* 10(5): 1530-40.
- CP** Jacob, M., Smith, J. C. Jr., and Chan, J. C. 1979. effect of steroid administration on growth and zinc metabolism in rats. *Federation Proceedings* 38(3, I): 610.
- FL** Jacob, M., Smith, J. C. Jr., and Chan, J. C. M. 1983. effects of metabolic acidosis on zinc and calcium metabolism in rats. *Annals Of Nutrition And Metabolism*. 27 (5): 380-385.
- Abstract** Jacob, M., Smith, J. C. Jr., and Chan, J. C. M. 1979. metabolic acidosis on zinc and calcium metabolism. *Pediatric Research* 13(4, II): 476.
- Drug** Jacob, M., Smith, J. C. Jr., and Chan, J. C. M. 1979. prednisone and zinc metabolism. *Pediatric Research* 13(4, II): 380.
- Drug** Jacob, Mary, Chan, James C. M., and Smith, J. Cecil Jr. effect of prednisone on growth and zinc metabolism in rats. *Nutr. Res. (N. Y.)* (1984) 4(5): 877-89 .
- FL** Jacob, Mary, Smith, J. Cecil Jr., and Chan, James C. M. effects of metabolic acidosis on zinc and calcium metabolism. *Ann. Nutr. Metab.* (1983) 27(5): 380-5.
- Mix** Jacob, Robert A., Baesler, Larry G., Klevay, Leslie M., Lee, Duane E., and Wherry, Patrick L. 1977. hypercholesterolemia in mice with meat anemia. *Nutr. Rep. Int.* 16(1): 73-9 .
- Nut def** Jacobs, F. A., Winter, T. W., and Sandstead, H. H. 1979. mesenteric lymph proteins in zinc-deficient rats. *American Journal of Physiology* 236(2): E180-E185.
- Mix** Jacobs, R. M., Fox, M. R., and Aldridge, M. H. 1969. changes in plasma proteins associated with the anemia produced by dietary cadmium in japanese quail. *J Nutr.* 99(2): 119-28.

- Abstract** Jacobs, R. M., Fox, M. R. S., and Fry, B. E. Jr. temporal changes in quail tissue mineral element concentrations on exposure to dietary cadmium and effects of cadmium on retention of mineral elements. *Federation Proceedings*. 31 (2). 1972 699
- No Dose** Jacobs, R. M., Jones, A. O., Fox, M. R., and Fry, B. E. Jr. 1978. retention of dietary cadmium and the ameliorative effect of zinc, copper, and manganese in japanese quail. *J Nutr*. 108(1): 22-32.
- Abstract** JACOBS, R. M., JONES, A. OL, MORRA, M. N., and FOX, M. RS. zinc antagonism of cadmium. *FED PROC*; 37 (3). 1978 405
- Abstract** Jacobs, R. M. Jones A. O. L. Johnson M. L. and Fox M. R. S. 1979. long-term retention of cadmium: the effects of zinc. *Fed.Proc.* 38(3): -T1.
- Bio Acc** Jacobs, R. M. Lee Jones A. O. Spivey Fox M. R. and Lener J. 1983. effects of dietary zinc, manganese, and copper on tissue accumulation of cadmium by japanese quail. *Proc.Soc.Exp.Biol.Med.* 172: 34-38.
- Mix** Jacobs, Richard M., Jones, Ann O. Lee, Fry, Bert E. Jr., and Fox, M. R. Spivey. 1978. decreased long-term retention of cadmium-115m in japanese quail produced by a combined supplement of zinc, copper, and manganese. *J. Nutr.* 108(6): 901-10 .
- Nut def** Jacobson, S. G., Keeling, P. W. N., Meadows, N. J., and Thompson, R. P. H. 1983. the electroretinogram in cats with zinc depletion. *Journal of Physiology* 338: 37P.
- Nut def** Jacobson, S. G., Meadows, N. J., Keeling, P. W., Mitchell, W. D., and Thompson, R. P. 1986. rod mediated retinal dysfunction in cats with zinc depletion: comparison with taurine depletion. *Clinical Science* 71(5): 559-64.
- Nut def** Jacobson, S. G., Meadows, N. J., Keeling, P. W. N., Mitchell, W. D., and Thompson, R. P. H. rod mediated retinal dysfunction in cats with zinc depletion: comparison with taurine depletion. *Clin. Sci. (1986)* 71(5): 559-64.
- Phys** Jacobsson, G., Hakansson, M. L., Hulting, A. L., and Meister, B. 1997. botulinum neurotoxin f, a vamp-specific endopeptidase, inhibits ca(2+)-stimulated gh secretion from rat pituitary cells. *Regulatory Peptides* 71(1): 37-44.
- CP** Jaczewski, Stefan and Monkiewicz, Jerzy . 1983. effect of heavy metals on the health and reproduction of rabbits. *Bioindyk. Skazen Przem. Roln. Mater. Pokonf.* Meeting Date 1980, 421-7. Editor(s): Fabiszewski, Jerzy. Publisher: Ossolineum, Wroclaw, Pol..
- Phys** Jaffe, E. K., Salowe, S. P., Chen, N. T., and Dehaven, P. A. porphobilinogen synthase ec-4.2.1.24 modification with methyl methanethiosulfonate a protocol for the investigation of metallo proteins. *Journal of Biological Chemistry*. 259 (8). 1984. 5032-5036.
- Nut def** Jagadeesan, V. effect of administration of aroclor 1254 on the activities of hepatic drug metabolizing enzymes in zinc deficiency. *J. Toxicol. Environ. Health* (1991) 34(2): 239-44.
- Nut def** Jagadeesan, V. and Oesch, F. effects of dietary zinc deficiency on the activity of enzymes associated with phase i and ii of drug metabolism in fischer-344 rats : activities of drug metabolising enzymes in zinc deficiency. *Drug-Nutr. Interact. (1988)* 5(4): 403-13.
- Nut def** Jagadeesan, V. and Oesch, F. 1988. effects of dietary zinc-deficiency on the activity of enzymes associated with phase-i and phase-ii of drug-metabolism in fischer-344 rats - activities of drug-metabolizing enzymes in zinc-deficiency. *Drug-Nutrient Interactions* 5(4): 403-413.

- Drug** Jagusch, K. T., Gray, M. H., Maclean, K. S., Towers, N. R., Menna, M. E. di, and McMillan, W. H. 1986. the cause of reproductive loss in gisborne-east coast ewe flocks. *Proceedings of the New Zealand Society of Animal Production* 46: 251-253.
- Abstract** Jahangeer, S., Teller, E. B., Watkins, D. W., Floor, M., and Alabaster, O. effect of dietary calcium fat and wheat bran on zinc and calcium metabolism in fischer-344 rats. *73RD ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, NEW ORLEANS, LOUISIANA, USA, MARCH 19-23, 1989. FASEB (FED AM SOC EXP BIOL) J.* 3 (4). 1989. A1066.
- FL** Jain, A. P. and Sarkar, P. M. responses of wild mice mus-musculus towards 2 acute poisons and a new food. *Zeitschrift Fuer Angewandte Zoologie.* 71 (2). 1984. 151-156.
- No Oral** Jain, Rakesh K., Gerlowski, Leonard E., Weissbrod, Jonas M., Wang, Jack, and Pierson, Richard N. Jr. kinetics of uptake, distribution, and excretion of zinc in rats. *Ann. Biomed. Eng.* (1981) 9(4): 347-61.
- Unrel** Jairam, R. and Potvin, P. G. zinc inclusion complexes of endodontate tripodands as carbonic anhydrase-inspired artificial esterases. *Journal of Organic Chemistry.* 57 (15). 1992. 4136-4141.
- In Vit** Jairam, Rick and Potvin, Pierre G. zinc dication inclusion complexes of endodontate tripodands as carbonic anhydrase-inspired artificial esterases. *J. Org. Chem.* (1992) 57(15): 4136-41.
- FL** Jakab, L., Rafai, P., Papp, Z., Brydl, E. Allatorvos-tudományi Egyetem Budapest Hungary, Beres, J., Beres, J., and Kelemen, A. Beres Rt. Budapest Hungary. 1995. the effect of cuni-stibol(r), a multi-microelement preparation, on the production and biological parameters of broiler rabbits. <original> a cuni-stibol(r) multi-mikroelem keverék hatására a hizonyulak fontosságát terjesztés és biológiai mutatóinak alakulására. *Allattenyésztes És Takarmányozás.* V. 44(6) P. 533-541
- Nut def** Jakinovich, William Jr. and Osborn, Donald W. zinc nutrition and salt preference in rats. *Am. J. Physiol.* (1981) 241(3): R233-R239.
- Rev** Jakobsen, J., Brimijoin, S., and Sidenius, P. 1983. axonal transport in neuropathy. *Muscle & Nerve* 6(2): 164-6.
- Mix** Jamall, I. S., Mignano, J. E., Lynch, V. D., Bidanset, J. H., Lau-Cam, C., and Greening, M. 1979. protective effects of zinc sulfate and l-lysine on acute ethanol toxicity in mice. *Environmental Research* 19(1): 112-120.
- Mix** Jamall, Ijaz S., Mignano, John E., Lynch, Vincent D., Bidanset, Jesse H., Lau-Cam, Ceasar, and Greening, Michael. protective effects of zinc sulfate and l-lysine on acute ethanol toxicity in mice. *Environ. Res.* (1979) 19(1): 112-20 .
- HHE** Jambon, B., Ziegler, O., Maire, B., Hutin, M. F., Parent, G., Fall, M., Burnel, D., and Duheille, J. 1988. thymulin (facteur serum serique) and zinc contents of the thymus glands of malnourished children. *American Journal Of Clinical Nutrition* 48(2): 335-342.
- No Control** James, L. F., Lazar, V. A., and Binns, W. 1966. effects of sublethal doses of certain minerals on pregnant ewes and fetal development. *Am J Vet Res.* 27(116): 132-135.
- Nut def** James, S. J. 1988. age-related alterations in the antigen-specific response to listeria infection in zinc-deficient mice. *Nutrition Research* 8(8): 899-909.
- Nut def** James, S. J., Swendseid, M., and Makinodan, T. macrophage-mediated depression of t-cell

proliferation in zinc-deficient mice. *J. Nutr.* (1987) 117(11): 1982-8.

- FL** Jamroz, D., Mazurkiewicz, M., Schleicher, A., and Fritz, Z. 1989. performance and degree of eimeria sp. infection of chickens with a five-day withdrawal period using coccidiostats and growth promotants. *Krmiva* 31(9-10): 165-172.
- No COC** Jamroz, D., Mazurkiewicz, M., Schleicher, A., Fritz, Z., and <Editors> M. Larbier. 1986. production consequences and health of broiler chicks infected with eimeria sp. with reference to the 5-day withdrawal period for growth stimulants and anticoccidials. <Document Title> *7e Conference Europeenne D'Aviculture Paris 1986, Volume 1.* 525-530.
- FL** Jamroz, D., Pres, J., Mazurkiewicz, M., and Krolczek, A. 1971. (some nutritional and physiological values in broilers given copper and zinc by various methods). *Medycyna Weterynaryjna* 27(No.8): 497-500.
- FL** Jamroz, D., Schleicher, A., Skorupinska, J., and Wiliczekiewicz, A. effect of growth stimulants on biochemical indices and white blood corpuscle picture of fattening chicks. *Roczniki Nauk Rolniczych Seria B Zootechniczna.* 106 (3-4). 1991. 69-92.
- No COC** Jamroz, D., Schleicher, A., Skorupinska, J., Wiliczekiewicz, A., and <Editors> Simon, F. 1988. the effect of growth promoters on biochemical indices and leucogram of blood in broilers. 198.
- No COC** Jamroz, D., Skorupinska, J., Wiliczekiewicz, A., and Schleicher, A. 1992. effect of feed composition and antibiotic growth promoters on blood chemistry, blood cells and histology of the small intestinal wall of broilers. *Wiener Tierarztliche Monatsschrift* 79(1): 13-19.
- No COC** Jamroz, D., Wiliczekiewicz, A., Skorupinska, J., Schleicher, A., <Editors> Flachowsky, G., Schone, F., and Hennig, A. 1991. effectiveness of various feed antibiotics on biochemical blood variables, length of intestine, meat quality, and bacterial count in digesta in the large intestine. 288.
- HHE** Janghorbani, M., Istfan, N. W., and Young, V. R. 1983. stable isotope approaches for measurement of dietary zinc availability in humans. *AcS Symposium Series* 210: 41-59.
- Meth** Janghorbani, M., Ting, B. T. G., and Steinke, F. H. intrinsic labelling of chicken meat with stable isotopes of zinc, for intended use in human feeding studies: feasibility and design considerations. *The British Journal Of Nutrition.* Nov 1981. v. 46 (3) p. 395-402. ill.
- HHE** Janghorbani, Morteza. AJCNA, Istfan, Nawfal W., Pagounes, James O., Steinke, Fred H., and Young, Vernon R. absorption of dietary zinc in man: comparison of intrinsic and extrinsic labels using a triple stable isotope method. *American Journal Of Clinical Nutrition.* Sept 1982. v. 36 (3) p. 537-545. ill., charts.
- Nut def** Jankowski, M. A., Uriu-Hare, J. Y., Rucker, R. B., and Keen, C. L. embryonic cell death patterns are different in embryos from zinc (zn) deficient dams compared to embryos from copper (cu) deficient, and diabetic dams. *Teratology* 1994 May;49(5):408
- Nut def** Jankowski, M. A., Uriu-Hare, J. Y., Rucker, R. B., and Keen, C. L. 1994. excessive cell death and apoptosis: possible mechanisms underlying maternal zn deficiency-induced teratogenesis. *FASEB Journal* 8(4-5): A695.
- Nut def** Jankowski, M. A., Uriu-Hare, J. Y., Rucker, R. B., and Keen, C. L. 1996. maternal diabetes and maternal copper deficiency result in increased oxidative damage (dna-protein crosslinks) in gestation day 11.0 rat embryos. *Teratology* 53(2): 113.

- Nut def** Jankowski, Margaret A., Uriu-Hare, Janet Y., Rucker, Robert B., Rogers, John M., and Keen, Carl L. maternal zinc deficiency, but not copper deficiency or diabetes, results in increased embryonic cell death in the rat : implications for mechanisms underlying abnormal development. *Teratology* (1995) 51(2): 85-93.
- No COC** Janssen, W. M. M. A., Versteegh, H. A. J., and Schagen, P. J. W. van Instituut voor Pluimveeonderzoek Het Spelderholt Beekbergen Netherlands. 1979. the effect of zinc-bacitracin on the performance of laying hens. 23 P. No. 212.79
- Unrel** Jansson, L., Ehnevid, H., Lindskog, S., and Blomlof, L. 1993. development of periapical lesions. *Swedish Dental Journal* 17(3): 85-93.
- Nut def** Jardieu, P. and Fraker, P. J. influence of zinc deficiency on the magnitude kinetics and affinity of the response to trinitrophenylated tnp lipopolysaccharide and tnp-ficoll in adult mice. *Journal of Trace Elements in Experimental Medicine*. 3 (1). 1990. 1-12.
- Phys** Jariwalla, R. J., Sabin, R., Lawson, S., and Herman, Z. S. lowering of serum cholesterol and triglycerides and modulation of divalent cations by dietary phytate. *Journal of Applied Nutrition*. 42 (1). 1990. 18-28.
- Drug** Jarlov, N. and Koefoed, F. 1984. dermatophilosis in the horse. occurrence in denmark. *Dansk Veterinaertidsskrift* 67(22): 1127-1134.
- No Control** JASIM, S. and TJALVE, H. 1986. effect of sodium pyridinethione on the uptake and distribution of nickel cadmium and zinc in pregnant and non-pregnant mice. *TOXICOLOGY* 38(3): 327-350.
- FL** Jaskowski, J. M., Jaskowski, P., and Jaskowski, L. Inst. Weterynarii Bydgoszcz Poland. 1986. attempt to define mineral deficiency threat in post-parturient cows by blood and clinical examinations. <original> proba okreslenia zagrozenia deficytami mineralnymi w okresie poporodowym u krow na podstawie badania krwi i obserwacji klinicznych. *Medycyna Weterynaryjna*. V. 42(3) P. 172-175
- Unrel** Jaspard Emmanuel, Wei Lei, and Alhenc-Gelas Francois(A). 1993. differences in the properties and enzymatic specificities of the two active sites of angiotensin i-converting enzyme (kininase ii): studies with bradykinin and other natural peptides. *Journal of Biological Chemistry* 268(13): 9496-9503.
- Plant** Jaumien, F. 1983. factors influencing flower bud formation on the pear tree cultivar'doyenne du comice'. iii. saccharides, nitrogen compounds and somemineral elements contents in pear leaves and shoots. *Acta Agrobotanica* 36(1/2): 103-133.
- Nut def** Jay, M., Stuart, S. M., McClain, C. J., Palmieri, D. A., and Butterfield, D. A. 1987. alterations in lipid-membrane fluidity and the physical state of cell-surface sialic-acid in zinc-deficient rat erythrocyte-ghosts. *Biochimica Et Biophysica Acta* 897(3): 507-511.
- Mix** Jayakumari, N., Nampoothiri, V. K., Nambisan, B., and Kurup, P. A. lowering of aortic cholesterol in hyper cholesterolemic rats effect of vitamin a ascorbic-acid protein fraction from black gram bovine aortic and intestinal mucosal muco poly saccharides and zinc salts. *Indian Journal of Experimental Biology*. 16 (12). 1978 (Recd. 1979). 1289-1291.
- No COC** Jayakumari, N., Nampoothiri, V. K., Nambisan, Bala, and Kurup, P. A. lowering of aortic cholesterol in hypercholesterolemic rats : part 1. effect of vitamin a, ascorbic acid, protein fraction from blackgram, bovine aortic and intestinal mucosal mps and zinc salts. *Indian J. Exp. Biol.* (1978) 16(12): 1289-91 .

- HHE** JAYANTHI, S., LADENHEIM, B., ANDREWS, A. M., and CADET, J. L. overexpression of human copper-zinc superoxide dismutase in transgenic mice attenuates oxidative stress caused by methylenedioxymethamphetamine (ecstasy). *NEUROSCIENCE*; 91 (4). 1999. 1379-1387.
- Mineral** Jayathangaraj, M. G., Gnanaprakasam, V., Srinivasan, S. R., Vijayakumar, R., and Dhanapalan, P. 1993. trial with chelated minerals in dairy cows. *Indian Veterinary Journal* 70(9): 878-879.
- FL** Jedra, M. and Malanowska, M. 1995. [nitritotriacetic acid (nta)--properties, distribution and behavior in the environment. i. chemical and toxicological properties of nta]. <original> kwas nitrylotrioctowy (nta)--własci i zachowanie w srodowisku. cz. i. własciowosci chemiczne i toksykologiczne nta. *Roczniki Panstwowego Zakladu Higieny* 46(3): 251-63.
- Rev** Jeffcott, L. B. and Savage, C. J. 1996. nutrition and the development of osteochondrosis (dyschondroplasia). *Pferdeheilkunde* 12(3): 338-342.
- Abstract** Jefferson, D. M., Liverpool, C., and Reid, L. M. hormonal modulation of steady-state levels of specific messenger rna in primary cultures of adult rat hepatocytes. *24TH ANNUAL MEETING OF THE AMERICAN SOCIETY FOR CELL BIOLOGY, KANSAS CITY, MO., USA, NOV. 12-16, 1984. J CELL BIOL.* 99 (4 Part 2). 1984. 201a.
- No COC** Jeffrey, P. D. polymerization behavior of bovine zinc insulin at neutral ph molecular weight of the subunit and the effect of glucose. *Biochemistry.* 13 (21). 1974 4441-4447.
- Mix** Jehan, Quaiser, Chowdhury, Anil R., Kamboj, V. P., and Kar, Amiya B. prevention of busulfan induced antispermato genesis in rats by follicle stimulating hormone and zinc. *Indian J. Exp. Biol.* (1969) 7(3): 173-4 .
- Mix** Jelic, T., Velickovic, G., Stankovic, M., and Nikolic, N. 1972. effect of simultaneous additions of copper and zinc on productivity of growing and fattening pigs. *Agronomski Glasnik* 34(7/8): 405-412.
- Rev** Jelliffe, D. B. and Jelliffe, E. F. P. 1979. milk zinc. *American Journal of Clinical Nutrition* 32(1): 3-4.
- Phys** Jendryczko, A. and Drozd, M. effect of cholecalciferol 1 25 dihydroxyvitamin d-3 and zinc in maternal diet on fetal bone metabolism in the rat. *Revue Roumaine De Biochimie.* 27 (2). 1990. 159-164.
- No COC** Jendryczko, A., Drozd, M., and Kucharz, E. 1983. changes in zinc and copper metabolism in rats with experimental hydralazine-induced collagen-like syndrome. *Rev. Roum. Biochim.* 20(3): 181-4 .
- Nut def** Jendryczko, A., Drozd, M., and Sieron, G. effect of zinc deficiency on methionine metabolism, methylation reactions and protein synthesis in isolated perfused rat placenta. *Rev. Roum. Biochim.* (1989) 26(2): 131-8.
- Unrel** Jenkins, K. J. and Kramer, J. K. G. 1991. differential effects of dietary fatty acids on fatty acid composition of phosphatidylinositol in calf tissues. *Nutrition Research* 11(2/3): 177-183.
- Mix** Jenkins, K. J. and Kramer, J. K. G. 1989. influence of excess dietary copper on lipid composition of calf tissues. *Journal of Dairy Science* 72(10): 2582-2591.
- Abstract** Jensen, K. E. 1965. *A Program for Research and Development of Respiratory Disease Vaccines.* <NOTE> Semi-Annual Progress Rept. for 1 Mar-15 Sep 65

- Abstract** Jensen, L. S. and Maurice, D. V. 1978. effect of chromium and corn fermentation solubles on interior egg quality. *Poultry Science* 57(4): 1147.
- CP** Jensen, Leo S. precipitation of a selenium deficiency by high dietary levels of copper and zinc. *Proc. Soc. Exp. Biol. Med.* (1975) 149(1): 113-16.
- No Oral** Jeong Yi-Na, Seo Mi-Kyeong, Choi Yun-Jeong, Kim In-Chull, and Lee Yong-Hee= (A). 1997. high-performance liquid chromatographic assay of a new hiv-1 protease inhibitor, lb71350, in the plasma of dogs. *Journal of Chromatography B* 703(1-2): 284-288.
- No COC** Jeroch, H., Berger, H., Wilke, A., Pfutzner, B., Jackisch, B., Weber, K., and Gebhardt, G. 1981. results obtained with the growth promotant nitrovin (of czechoslovakianorigin) in the rearing of calves, laying hens and chickens. *Biologizace a Chemizace Zivocisne Vyroby, Veterinaria* 17(2): 143-150.
- FL** Jeroch, H., Engerer K-H, Keller, G., Berger, H., and Gebhardt, G. effect of the ergotropic substance nitrovin on broiler fattening with various types of rations fattening data. *Archiv Fuer Tierernaehrung*. 30 (9). 1980 (Recd. 1981). 663-670.
- No COC** Jeroch, H., Richter, G., Meixner, B., Schuler, D., Voigt, C., Jahn, S., and Hennig, A. 1977. use of antibiotics in feeds for livestock in the german democraticrepublic in the light of recent experimental results. *Tierernahrung Und Fuetterung* (10): 276-283.
- Bact** Jerusik, R. J., Kadis, S., Chapman, W. L. Jr, and Wooley, R. E. 1977. experimental rat model for corynebacterium-renal induced pyelo nephritis. *Infection and Immunity*. 18(3): 828-832.
- Bact** Jerusik, R. J., Kadis, S., Chapman, W. L. Jr, and Wooley, R. E. 1977. influence of acetohydroxamic acid on experimental corynebacterium renale pyelonephritis. *Canadian Journal of Microbiology* 23(10): 1448-55.
- Nut def** Jeung, J. H. and Cho, S. Y. 1988. effects of dietary zinc on the ethanol metabolizing enzyme activity and ethanol elimination rate in rat. *Journal of the Korean Society of Food and Nutrition* 17(3): 269-276.
- Nut def** Jeung, Jae Hong and Cho, Soo Yeul. effects of dietary zinc on the ethanol metabolizing enzyme activity and ethanol elimination rate in rat. *Han'Guk Yongyang Siklyong Hakhoechi* (1988) 17(3): 269-76.
- Unrel** Jew, R. C., Weine, F. S., Keene, J. J. Jr, and Smulson, M. H. 1982. a histologic evaluation of periodontal tissues adjacent to root perforations filled with cavit. *Oral Surgery, Oral Medicine, and Oral Pathology* 54(1): 124-35.
- Drug** Jeyasingham, Marina D., Rooprai, Harcharan K., Dexter, David, Pratt, Oliver E., and Komoly, Samuel. zinc supplementation does not prevent cuprizone toxicity in the brain of mice. *Neurosci. Res. Commun.* (1998) 22(3): 181-187.
- Phys** Jezyk, P. F., Haskins, M. E., MacKay-Smith, W. E., and Patterson, D. F. lethal acrodermatitis in bull terriers. *Journal Of The American Veterinary Medical Association*. Apr 15, 1986. v. 188 (8) p. 833-839. ill.
- Nut def** Ji, L. L., Stratman, F. W., and Lardy, H. A. 1992. antioxidant enzyme response to selenium deficiency in rat myocardium. *Journal Of The American College Of Nutrition*. 11(1): 79-86.
- No COC** Jia, Xiujuan, Emerick, Royce J., and Kayongo-Male, Henry. 1997. the ph dependence of silicon-iron interaction in rats. *Biol. Trace Elem. Res.* (1998) 59(1-3): 113-122 .

Nut def	Jiahui, Wu, Rongna, Ren, Wen, Wei, and Dixiong, Xu. effects of zinc deficiency on the brain development in rats. <i>J. Med. Coll. PLA</i> (1995) 10(1): 42-5 -9094.
No Oral	Jiang, Huimin, Han, Guo'an, Gao, Huafang, Shi, Wen, and Dong, Yunling. the correlation studies of maternal zinc level and fetal malformation. <i>Shandong Yike Daxue Xuebao</i> (1995) 33(2): 115-8.
CP	Jiang, K. 1985. zinc and copper absorption in rats fed dietary cellulose. <i>Federation Proceedings</i> 44: 1506.
No COC	Jiang, K. S. 1986. effects of dietary cellulose xylan on absorption and tissue contents of zinc and copper in rats. <i>The Journal Of Nutrition</i> . 116(6): 999-1006.
Mix	Jiang, Kuo Shii. effects of dietary cellulose and xylan on absorption and tissue contents of zinc and copper in rats. <i>J. Nutr.</i> (1986) 116(6): 999-1006 .
CP	Jiang, L. J., Maret, W., and Vallee, B. L. 1998. the atp-metallothionein complex. <i>Proceedings of the National Academy of Sciences of the United States of</i>
Gene	Jiang, R., Lan, Y., Norton, C. R., Sundberg, J. P., and Gridley, T. 1998. the slug gene is not essential for mesoderm or neural crest development in mice. <i>Developmental Biology</i> 198(2): 277-85.
HHE	Jiang, W., Graham, B., Spiccia, L., and Hearn, M. T. 1998. protein selectivity with immobilized metal ion-tacn sorbents: chromatographic studies with human serum proteins and several other globular proteins. <i>Analytical Biochemistry</i> 255(1): 47-58.
Nut def	Jiang, Yugang, Cheng, Yiyong, Wang, Donglan, Lin, Chunzhu, and Gu, Jingfan. effects of zinc deficiency and supplementation on zinc nutritional status in exercised rats. <i>Yingyang Xuebao</i> (1995) 17(4): 368-73.
Unrel	Jiang, Z., You, D. Y., Chen, X. C., and Wu, J. 1992. monitoring of serum markers for fibrosis during ccl4-induced liver damage. effects of anti-fibrotic agents. <i>Journal of Hepatology</i> 16(3): 282-9.
FL	Jilg, T. 1992. feeding value and acceptance of regrowths in extensively used stands inbaden-wurttemberg for growing cattle. 443-446.
No Oral	Jin, Taiyi, Nordberg, Gunnar, Sehlin, Janove, and Vesterberg, Olof. protection against cadmium-metallothionein nephrotoxicity in streptozotocin-induced diabetic rats : role of increased metallothionein synthesis induced by streptozotocin. <i>Toxicology</i> (1996) 106(1-3): 55-63.
No Dose	Jiracek, J., Yiotakis, A., Vincent, B., Checler, F., and Dive, V. 1996. development of the first potent and selective inhibitor of the zinc endopeptidase neurolysin using a systematic approach based on combinatorial chemistry of phosphinic peptides. <i>Journal of Biological Chemistry</i> 271(32): 19606-11.
HHE	Jirka, M. and Blanicky, P. polymorphism of human serum zinc alpha-2 glyco protein and its behavior during ontogenesis using quantitative crossed starch gel immuno electrophoresis. . <i>Clinica Chimica Acta</i> . 103 (1). 1980. 61-66.
No COC	Joermann, G. 1998. a review of secondary-poisoning studies with rodenticides. <i>Bulletin OEPP</i> 28(1/2): 157-176.
Nut def	Johanning, G. L., Browning, J. D., Bobilya, D. J., Veum, T. L., and O'Dell, B. L. 1990. effect of

zinc deficiency and food restriction in the pig on erythrocyte fragility and plasma membrane composition. *Nutrition Research* 10(12): 1463-1471.

- CP** Johanning, G. L., Browning, J. D., Bobilya, D. J., Veum, T. L., and O'Dell, B. L. 1990. effect of zinc deficiency of enzyme activities in rat and pig erythrocyte membranes. *Proceedings Of The Society For Experimental Biology And Medicine*. 195(2): 224-229.
- CP** Johanning, G. L., Miller, D. S., and O'Dell, B. L. effect of zinc deficiency on lipid and protein profiles of the rat erythrocyte membrane. *Trace Elements In Man And Animals 6 / Edited By Lucille S. Hurley, ... [Et Al.]*. p. 363-364.
- Nut def** Johanning, G. L. and O'Dell, B. L. effect of zinc deficiency and food restriction in rats on erythrocyte membrane zinc, phospholipid and protein content. *The Journal Of Nutrition*. Nov 1989. v. 119 (11) p. 1654-1660. ill.
- Nut def** Johanning, Gary L. and O'Dell, Boyd L. effect of zinc deficiency and food restriction in rats on erythrocyte membrane zinc, phospholipid and protein content. *J. Nutr.* (1989) 119(11): 1654-60.
- Drug** Johansen, M., Jorsal, S. E., Andresen, L. O., Thomsen, L. K., and Baekbo, P. 2000. prevention and treatment of oedema disease in denmark 1994-1998. areview of the results of danish experiments. *Dansk Veterinaertidsskrift* 83(3): 6-9.
- Plant** Johansson Inga-Maj and Forsman Cecilia(A). 1994. solvent hydrogen isotope effects and anion inhibition of co-2 hydration catalysed by carbonic anhydrase from pisum sativum. *European Journal of Biochemistry* 224(3): 901-907.
- IMM** Johansson Maria H, Bieberich Charles, Kase-Sjostrom Anna, Yoshioka Takayuki, Hoglund Elin, Christy Barbara A, Scangos George, Karre Klas, Jay Gilbert, and Hoglund Petter(A). 2000. differential effects on t cell and nk cell development by tissue-specific expression of h-2dd transgene. *European Journal of Immunology*. 30(2): 525-533.
- No Oral** Johnson, A. D., Sigman, M. B., and Miller, W. J. 1970. early actions of cadmium in the rat and domestic fowl testis. 3. subcellular location of injected 109 cadmium. *Journal of Reproduction and Fertility* 23(2): 201-13.
- In Vit** Johnson, A. L. and Brake, J. 1992. zinc-induced molt: evidence for a direct inhibitory effect on granulosa cell steroidogenesis. *Poult. Sci.* (1992) 71(1): 161-7.
- Gene** Johnson, A. L., Bridgham, J. T., Digby, M. R., and Lowenthal, J. W. 1998. expression of the inhibitor of t-cell apoptosis (ita) gene in hen ovarian follicles during development. *Biology of Reproduction* 58(2): 414-20.
- Nut def** Johnson, D. A. and Alvares, O. F. deficiency-induced changes in rat parotid salivary proteins. *The Journal Of Nutrition*. Oct 1984. v. 114 (10) p. 1955-1964. ill.
- Abstract** Johnson, D. A. and Alvares, O. F. differences in rat parotid salivary proteins with zinc deficiency. *ANNUAL SESSION OF THE AMERICAN ASSOCIATION FOR DENTAL RESEARCH, CINCINNATI, OHIO, USA, MAR. 17-20, 1983. J DENT RES.* 62 (Spec. Issue). 1983. 201.
- Nut def** Johnson, D. A., Lopez, H., and Navia, J. M. 1995. effects of protein deficiency and diet consistency on the parotid gland and parotid saliva of rats. *Journal of Dental Research* 74(8): 1444-52.
- Nut def** Johnson, Dorthea A. and Alvares, Olav F. zinc deficiency-induced changes in rat parotid

salivary proteins. *J. Nutr.* (1984) 114(10): 1955-64.

- Nut def** Johnson, I. T., Gee, J. M., and Southon, S. 1983. the growth and function of the small-intestine in the zinc-deficient rat. *Gastroenterologie Clinique Et Biologique* 7: 503.
- Nut def** Johnson, M. A. 1986. interaction of dietary carbohydrate, ascorbic acid and copper with the development of copper deficiency in rats. *The Journal Of Nutrition.* 116(5): 802-815.
- Nut def** Johnson, M. A. and Flagg, E. W. 1986. effects of sucrose and cornstarch on the development of copper deficiency in rats fed high levels of zinc. *Nutrition Research.* 6(11): 1307-1319.
- CP** Johnson, M. A. and Greger, J. L. 1983. interactions of dietary tin and zinc in rats. *Federation Proceedings* 42: 818.
- CP** Johnson, M. A. and Greger, J. L. 1984. tin, copper, iron and calcium-metabolism of rats fed various dietary levels of inorganic tin and zinc. *Federation Proceedings* 43: 680.
- Plant** JOHNSON, M. S., MCNEILLY, T., and PUTWAIN, P. D. revegetation of metalliferous mice spoil contaminated by lead and zinc. *ENVIRON POLLUT*; 12 (4). 1977 261-278
- Nut def** Johnson, Mary Ann. interaction of dietary carbohydrate, ascorbic acid and copper with the development of copper deficiency in rats. *J. Nutr.* (1986) 116(5): 802-15.
- Nut def** Johnson, Mary Ann and Flagg, Elaine W. effects of sucrose and cornstarch on the development of copper deficiency in rats fed high levels of zinc. *Nutr. Res. (N. Y.)* (1986) 6(11): 1307-19.
- Mix** Johnson, Mary Ann and Greger, J. L. absorption, distribution and endogenous excretion of zinc by rats fed various dietary levels of inorganic tin and zinc. *J. Nutr.* (1984) 114(10): 1843-51 .
- Mix** Johnson, Mary Ann and Greger, J. L. tin, copper, iron and calcium metabolism of rats fed various dietary levels of inorganic tin and zinc. *J. Nutr.* (1985) 115(5): 615-24 .
- Nut def** Johnson, Mary Ann and Hove, Sheryl S. development of anemia in copper-deficient rats fed high levels of dietary iron and sucrose. *J. Nutr.* (1986) 116(7): 1225-38.
- Nut def** Johnson, Mary Ann and Murphy, Cynthia Lee. adverse effects of high dietary iron and ascorbic acid on copper status in copper-deficient and copper-adequate rats. *Am. J. Clin. Nutr.* (1988) 47(1): 96-101.
- CP** Johnson, P. E. and Evans, G. W. 1980. source of maternal milk zinc for absorption by suckling rats. *Proceedings of the Society for Experimental Biology and Medicine*; 163
- CP** Johnson, P. E., Hunt, J. R., and Ralston, N. V. C. 1987. the effect of body zinc stores and current diet on true absorption, endogenous excretion, and zinc balance in rats. *Federation Proceedings* 46: 600.
- Nut def** Johnson, P. E., Hunt, J. R., and Ralston, N. V. C. 1988. the effect of past and current dietary zn intake on zn absorption and endogenous excretion in the rat. *The Journal Of Nutrition.* 118(10): 1205-1209.
- HHE** Johnson, P. E., Lykken, G., Mahalko, J., Milne, D., Inman, L., and Sandstead, H. H. 1983. the effect of browned and unbrowned corn products on absorption of zinc, iron, and copper in humans. *Acs Symposium Series* 215: 349-360.

No Dose	Johnson, Phyllis E. and Evans, Gary W. source of maternal milk zinc for adsorption by suckling rats. <i>Proc. Soc. Exp. Biol. Med.</i> (1980) 163(3): 372-5 .
Nut	Johnson, Phyllis E., Hunt, Janet R., and Ralston, Nicholas V. C. 1988. the effect of past and current dietary zinc intake on zinc absorption and endogenous excretion in the rat. <i>J. Nutr.</i> 118(10): 1205-9 .
Nut def	Johnson, R. C. and Shah, S. N. 1978. effects of zinc deficiency and undernutrition during postweaning on brain development, lipid composition and myelin content. <i>Federation Proceedings</i> 37(3): 355.
CP	JOHNSON, R. W., CURTIS, S. E., DANTZER, R., and KELLEY, K. W. 1991. neuroimmune interactions in chickens central and peripheral injections of lipopolysaccharide. <i>EIGHTIETH ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION</i>
Nut def	Johnson, Ronald C. and Shah, Shantilal N. effect of feeding zinc deficient diet and restricted food intake during early post weaning period on rat brain development : myelin and synaptosome content and lipid composition. <i>Biochem. Arch.</i> (1987) 3(1): 77-84.
Drug	Johnson, S L and Pond, W G. inorganic vs. organic hg[mercury] toxicity in growing rats: protection by dietary se[selenium] but not zn[zinc]. <i>Nutr Rep Int</i> Feb 1974 9 (2): 135-147. Ref.
Drug	Johnson, S L and Pond, W G. inorganic vx. organic hg [mercury] toxicity in growing rats: protection by dietary se but not zn [selenium, zinc]. <i>Nutr Rep Int</i> Feb 1974 9 (2): 135-147. Ref.
Drug	Johnson, Sharon L. and Pond, Wilson G. inorganic vs. organic mercury toxicity in growing rats . protection by dietary selenium but not zinc. <i>Nutr. Rep. Int.</i> (1974) 9(2): 135-47 .
Abstract	Johnson, W. T. and Canfield, W. K. effects of dietary zinc and protein on intestinal absorption and excretion of zinc in streptozotocin-diabetic rats. <i>69TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ANAHEIM, CALIF., USA, APR. 21-26, 1985. FED PROC.</i> 44 (4). 1985. 995.
No COC	Johnson, W. T. and Canfield, W. K. 1986. the effects of endogenous picolinic acid on zinc metabolism in the rat . <i>Nutrition Research.</i> 6(10): 1189-1200.
Alt	Johnson, W. T. and Canfield, W. K. 1985. intestinal absorption and excretion of zinc in streptozotocin-diabetic rats as affected by dietary zinc and protein. <i>Journal of Nutrition</i> 115(9): 1217-27.
Alt	Johnson, W. T. and Canfield, W. K. 1985. intestinal absorption and excretion of zinc in streptozotocin-diabetic rats as affected by dietary zinc and protein. <i>The Journal Of Nutrition.</i> 115(9): 1217-1227.
No Dose	Johnson, W. T. and Evans, G. W. isolation of a copper zinc thionein from the small intestine of neonatal rats. <i>Biochemical and Biophysical Research Communications.</i> 96 (1). 1980. 10-17.
No Oral	Johnson, W. T. and Evans, G. W. 1982. tissue uptake of zinc in rats following the administration of zinc dipicolinate or zinc histidinate. <i>Journal of Nutrition</i> 112(5): 914-9.
Alt	Johnson, W. T. JONUA and Evans, G. W. 1984. effects of the interrelationship between dietary protein and minerals on tissue content of trace metals in streptozotocin-diabetic rats (zinc, iron, copper, picolinic carboxylase). <i>The Journal Of Nutrition.</i> 114 (1): 180-190.
Mix	Johnson, W. Thomas and Canfield, Wesley K. the effects of endogenous picolinic acid on zinc

metabolism in the rat. *Nutr. Res. (N. Y.)* (1986) 6(10): 1189-200 .

- Alt** Johnson, W. Thomas and Canfield, Wesley K. intestinal absorption and excretion of zinc in streptozotocin-diabetic rats as affected by dietary zinc and protein. *J. Nutr.* (1985) 115(9): 1217-27.
- Nut def** Johnson, W. Thomas and Saari, Jack T. temporal changes in heart size, hematocrit and erythrocyte membrane protein in copper-deficient rats. *Nutr. Res. (N. Y.)* (1991) 11(12): 1403-14.
- Drug** Johnston, N. P. and Arscott, G. H. 1974. effect of a fermentation residue and an antibiotic on growth of chickens fed rations containing corn or wheat. *Poultry Science.* 53 (4): 1335-1341.
- Phys** Johnston, R. E. 1992. vomeronasal and/or olfactory mediation of ultrasonic calling and scent marking by female golden hamsters. *Physiology & Behavior* 51(3): 437-48.
- Phys** Johnston, R. E. and Mueller, U. G. 1990. olfactory but not vomeronasal mediation of scent marking by male golden hamsters. *Physiology & Behavior* 48(5): 701-6.
- No Oral** Jonasson, H., Basu, S., Andersson, B., and Kindahl, H. 1984. renal excretion of prostaglandin metabolites arginine vasopressin and sodium during endo toxin and endogenous pyrogen induced fever in the goat. *Acta Physiologica Scandinavica.* 120(4): 529-536.
- No COC** Jones, A. P., Olster, D. H., and States, B. 1996. maternal insulin manipulations in rats organize body weight and noradrenergic innervation of the hypothalamus in gonadally intact male offspring. *Brain Research. Developmental Brain Research* 97(1): 16-21.
- Bio Acc** Jones, F. T., Hagler, W. M. Jr., and Hamilton, P. B. 1984. correlation of aflatoxin contamination with zinc content of chickenfeed. *Applied and Environmental Microbiology* 47(3): 478-480.
- CP** JONES, J. D. rapeseed protein concentrates-toxicology and nutrition. *PROC INT RAPESEED CONF 5TH 2:128-132,1979*
- Abstract** JONES, M. L., THORESON, T. E., RAO, B. S., and SANDSTEAD, H. H. effects of chronic cadmium exposure on tissue metals and blood pressure in female rats. *FED PROC; 37 (3).* 1978 894
- Unrel** Jones, P. J. H., Leichter, J., and Lee, M. 1981. uptake of zinc, folate and analogs of glucose and amino acid by the rat fetus exposed to alcohol in utero. *Nutrition Reports International.* 24 (1): 75-83.
- Mix** Jones, S. G., Jones, M. M., Holscher, M. A., and Vaughn, W. K. 1988. the effect of zinc on the dithiocarbamate-induced mobilization of cadmium deposits in mice. *Journal of Toxicology and Environmental Health* 23(1): 91-101.
- Mix** Jones, Shirley G., Jones, Mark M., Holscher, Myron A., and Vaughn, William K. the effect of zinc on the dithiocarbamate-induced mobilization of cadmium deposits in mice. *J. Toxicol. Environ. Health* (1988) 23(1): 91-101.
- CP** JONGBLOED, A. W. and LENIS, N. P. 1969-1993. excretion of nitrogen and some minerals by livestock. *VERSTEGEN*
- FL** Jonson, G. and Jacobsson, S.-O. 1973. (effect of dietary antibiotics on calf mortality). *Svensk Veterinartidning* 25(No.1): 17-22.

- Nut** Jordan, D., Suck, C., Veisseire, M., and Chazot, G. 1986. zinc may play a role in the regulation of thyrotropin function. *Hormone Research* 24(4): 263-268.
- HHE** Jordan, J., Ghadge, G. D., Prehn, J. H., Toth, P. T., Roos, R. P., and Miller, R. J. 1995. expression of human copper/zinc-superoxide dismutase inhibits the death of rat sympathetic neurons caused by withdrawal of nerve growth factor. *Molecular Pharmacology* 47(6): 1095-1100.
- Nut def** Joschko, Marion A., Dreosti, Ivor E., and Tulsi, Ram S. zinc/vitamin a interactions and teratogenesis in rats : a light and electron microscope study. *Nutr. Res. (N. Y.)* (1989) 9(2): 205-16.
- Nut def** Joseph, C. E., Ashrafi, S. H., and Waterhouse, J. P. structural changes in rabbit oral epithelium caused by zinc deficiency. *Journal of Nutrition*. 111 (1). 1981. 53-57.
- Nut def** Joseph, Charles E., Ashrafi, Shahid E., and Waterhouse, John P. structural changes in rabbit oral epithelium caused by zinc deficiency. *J. Nutr.* (1981) 111(1): 53-7.
- Nut def** Joseph, Charles E., Ashrafi, Shahid H. , Steinberg, Arnold D., and Waterhouse, John P. zinc deficiency changes in the permeability of rabbit periodontium to 14c-phenytoin and 14c-albumin. *J. Periodontol.* (1982) 53(4): 251-6.
- No Oral** Joyamma, V., Rao, S. G., Hrishikeshavan, H. J., Aroor, A. R., and Kulkarni, D. R. 1990. biochemical mechanisms and effects of mimosa pudica (linn) on experimental urolithiasis in rats. *Indian Journal of Experimental Biology* 28(3): 237-40.
- Unrel** Jubb, T. F. Melbourne Univ. Maffra Australia Rural Veterinary Unit, Malmo, J. Maffra Veterinary Centre Maffra Australia, Morton, J. M. Victorian Dept. of Agriculture and Rural Affairs Warrnambool Australia, Button, C., and Jerrett, I. V. Victorian Dept. of Agriculture and Rural Affairs Bairnsdale Australia Regional Veterinary Lab. 1990. inherited epidermal dysplasia in holstein-friesian calves [baldy calf syndrome; case study]. *Australian Veterinary Journal*. V. 67(1) P. 16-18
- CP** Judd, A. M., Macleod, R. M., and Login, I. S. zinc may regulate pituitary prolactin secretion. *FREDERICKSON, C. J., G. A. HOWELL AND E. J. KASARSKIS (ED.). NEUROLOGY AND NEUROBIOLOGY, VOL. 11A. THE NEUROBIOLOGY OF ZINC, PART A. PHYSIOCHEMISTRY, ANATOMY, AND TECHNIQUES; PROCEEDINGS OF A SATELLITE SYMPOSIUM TO THE ANNUAL MEETING OF THE SOCIETY FOR NEUROSCIENCE, BOSTON, MASS., USA, NOV. 4-6, 1983. XIV+390P. ALAN R. LISS, INC.: NEW YORK, N.Y., USA. ILLUS. ISBN 0-8451-2712-8. 0 (0). 1984. 91-104.*
- In Vit** Judd, Allan M., Macleod, Robert M., and Login, Ivan S. zinc acutely, selectively and reversibly inhibits pituitary prolactin secretion. *Brain Res.* (1984) 294(1): 190-2 .
- Bio Acc** Juneja, S. C., Harjit Kaur, and Arora, S. P. National Dairy Research Inst. Karnal India Dairy Cattle Nutrition Div. 1989. effects ration and season on plasma levels of iron, copper and zinc in crossbred cows during estrous cycle. *Asian Journal of Dairy Research*. V. 8(3) P. 133-138
- CP** Jung, S. C(A), Oh, S. J(A), Kim, J. H., Koh, J. Y., and Shin, H. C(A). 1998. the effects of physiological concentration of beta-amyloid on the sensory transmission in the primary somatosensory (si) cortex of anesthetized rats. *Society for Neuroscience Abstracts* 24(1-2): 1457.
- CP** Jurata, L. W., Kenny, D. A., and Gill, G. N. 1996. nuclear lim interactor, a rhombotin and lim homeodomain interacting protein, is expressed early in neuronal development. *Proceedings of*

- Abstract** Juriloff, D. M., Harris, M. J., Hall, J. L., and Tredwell, S. A. dietary effect on frequency of exencephaly in selh/bc mice. *Teratology* 1996 Feb;53(2):113
- OAC** Jurvelin, J., Lahtinen, T., Kiviranta, I., Arnala, I., Lappalainen, R., Tammi, M., and Helminen, H. J. 1988. blood flow, histomorphology and elemental composition of the canine femur after physical training or immobilization. *Acta Physiologica Scandinavica* 132(3): 385-9.
- Drug** Juzwiak, S., Wojcicki, J., Machoy-Mokrzynska, A., Samochowiec, L., Bialecka, M., Juzyszyn, Z., Barcew-Wiszniewska, B., Skowron, J., Rozewicka, L., and Kadlubowska, D. effect of lecithin on the development of experimental atherosclerosis in rabbits. *Phytomedicine* (1996) 2(3): 199-204.
- Mix** Kadiiska, M., Stoichev, C., and Serbinova, E. effect of multiple application of some heavy metals on nadph-dependent peroxidation of lipids. *Eksp. Med. Morfol.* (1984) 23(3): 123-6 .
- No Oral** Kadiri Mukaila(A), Bedri Babiker A, and Ajao Salami S. 1995. toxicological screening of some nigerian wild legumes. *Revista De Biologia Tropical* 44(1): 269-274.
- Nut def** Kadrabova, J., Madaric, A., and Ginter, E. zinc and copper in the tissues and serum of cadmium intoxicated guinea pigs : influence of vitamin c. *Physiol. Res. (Prague)* (1993) 42(4): 261-6.
- Phys** Kadzere, C. T(A), Llewelyn, C. A., and Chivandi, E. 1997. plasma progesterone, calcium, magnesium and zinc concentrations from oestrus synchronization to weaning in indigenous goats in zimbabwe. *Small Ruminant Research* 24(1): 21-26.
- Mix** Kaeaeentee, E., Kurkela, P. Food and Public Health Laboratory Kauhajoki Finland, and Jaakkola, K. Kristiina Medical Centre Kristiinankaupunki Finland. 1982. effects of dietary organic selenium content on fowls, chicks and eggs [iron, zinc, copper, sulphur, fe, zn, cu, s]. *Journal of the Scientific Agricultural Society of Finland.* V. 54(2) P. 113-118
- FL** Kaemmerer, K. and Budden, R. 1972. zinc bacitracin and its tolerance. *Zentralblatt Fur Veterinarmedizin* 19A(8): 686-704.
- Unrel** Kaemmerer, K. and Fink, J. 1984. model experiments for increasing the efficacy of zinc bacitracin. *Deutsche Tierarztliche Wochenschrift* 91(9): 320-324.
- FL** Kaemmerer, K. and Kietzmann, M. 1983. stress-protective effect of orally administered zinc bacitracin in rats. *Zentralblatt Fur Veterinarmedizin, A* 30(9): 712-721.
- Abstract** Kaiser, L. L., Tamura, T., Halsted, C. H., and Hurley, L. S. intestinal and hepatic folate conjugase in zinc deficient rats. *65TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ATLANTA, GA., USA, APRIL 12-17, 1981. FED PROC.* 40 (3 Part 2). 1981. 865.
- HHE** Kaiser, R., Holmquist, B., Hempel, J., Vallee, B. L., and Jornvall, H. class iii human liver alcohol dehydrogenase a novel structural type equidistantly related to the class i and class ii enzymes. *BIOCHEMISTRY. Biochemistry.* 27 (4). 1988. 1132-1140.
- In Vit** KAJI, T., KAWATANI, R., TAKATA, M., HOSHINO, T., MIYAHARA, T., KOZUKA, H., and KOIZUMI, F. the effects of cadmium copper or zinc on formation of embryonic chick bone in tissue culture. *TOXICOLOGY; 50 (3).* 1988. 303-316.

- In Vit** Kaji, T., Miyahara, T., Kawatani, R., Hoshino, T., Kozuka, H., and Koizumi, F. biochemical and histological study of the effects of cadmium copper or zinc on bone formation of embryonic chick bone in tissue culture . *JOINT JAPAN-USA CONGRESS OF PHARMACEUTICAL SCIENCES, HONOLULU, HAWAII, USA, DECEMBER 2-7, 1987. J PHARM SCI.* 76 (11). 1987. S134.
- In Vit** KAJI, T., TAKATA, M., HOSHINO, T., MIYAHARA, T., KOZUKA, H., KURASHIGE, Y., and KOIZUMI, F. role of zinc in protection against cadmium-induced toxicity in formation of embryonic chick bone in tissue culture. *TOXICOL LETT (AMST);* 44 (1-2). 1988. 219-227.
- In Vit** Kaji Toshiyuki(A), Yamamoto Chika, Tsubaki Sumiyo, Ohkawara Susumu, Sakamoto Michiko, Sato Masao, and Kozuka Hiroshi. 1993. metallothionein induction by cadmium, cytokines, thrombin endothelin-1 in cultured vascular endothelial cells. *Life Sciences* 53(15): 1185-1191.
- In Vit** Kaji, Toshiyuki Toyama Medical & Phamaceutical Univ Japan, Takata, Masakazu, Miyahara, Tatsuro, Kozuka, Hiroshi, and Koizumi, Fumitomo. interaction of zinc with cadmium and copper on ossification of. *Arch Environ Contam Toxicol.* V19, N5, P653(4)
- FL** Kal'nitskii, B. D., Kharitonova, O. V., Bordun, G. V., and Vinokurova, V. T. 1986. effect of diets with varying ratios of concentrates to pelleted feedson retention of minerals in heifers. *Byulleten' Vsesoyuznogo Nauchno-Issledovatel'Skogo Instituta Fiziologii, Biokhimii i Pitaniya Sel'Skokhozaistvennykh Zhivotnykh* (1-80): 6-9.
- In Vit** Kalan, J. M., Keathley, P. S., Chan, W. M. Y., and Berman, W. F. 1981. developmental analysis of zinc-absorption in rat intestinal rings. *Gastroenterology* 80: 1360.
- Nut def** Kalinowski, J. and Chavez, E. R. 1984. effect of low dietary zinc during late gestation and early lactation onthe sow and neonatal piglets. *Canadian Journal of Animal Science* 64(3): 749-758.
- Nut def** Kalinowski, J. and Chavez, E. R. 1986. low dietary zinc intake during pregnancy and lactation of gilts. 2.effects on offspring. *Canadian Journal of Animal Science* 66(1): 217-227.
- Abstract** Kalinowski, J., Postigo, A., Talavera, V., and Vallejos, M. 1979. effect of mineral supplements on the reproductive performance of eweson pasture in the high andes. *Memoria, Asociacion Latinoamericana De Produccion Animal* 14: 35.
- In Vit** Kalinowski, Marion, Wolf, Gerald, and Markefski, Michael. concentration and subcellular localization of zinc in the hippocampal formation, cerebellum, and whole brain during the postnatal development of the rat. *Acta Histochem.* (1983) 73(1): 33-40 .
- Alt** Kalitsin, D., Konstantinov, N., Ivanov, N., and Ivanova, L. evaluating the effect of various sulfhydryl group activators on experimentally induced cataract in test animals. *Scr. Sci. Med.* (1979) : 16, 11-13.
- Fate** Kalla, N. R., Bisnooduth, U., and Ranga, A. 1990. 65zn incorporation in the male reproductive organs following gossypol treatment. *Acta Europaea Fertilitatis* 21(2): 81-3.
- Abstract** Kalla, N. R., Ujoodha, B., Vyas, R., Ranga, A., and Foo, J. effect of gossypol on zinc-65 incorporation in the reproductive organs. *3RD INTERNATIONAL CONGRESS OF ANDROLOGY, BOSTON, MASS., USA, APR. 27-MAY 2, 1985. J ANDROL.* 6 (2 Suppl.). 1985. P-49.
- Prim** KAMBADUR, R., PALIWAL, V. K., and NATH, R. 1952. reactivation of apoenzymes by renal isometallothioneins from rhesus monkey under nutritional stress. *KAGI*
- FL** Kamelova, S. T. 1979. effective trace element supplements in feed mixtures for broilerchickens.

- Rev** Kaminski, P. 1998. the impact of ca and heavy metals upon the nest development of sparrows (passer spp.) and other synanthropic birds . *Polish J Environ Stud.* 7(2): 53-65.
- Surv** Kaminski, P., Choinski, A., and Wolosiuk, B. 1993. dynamics of the content of selected elements in the nestling development of the house martin *delichon urbica* in a rural landscape. *ACTA ORNITHOLOGICA (WARSAW).* 28(1): 23-37.
- Surv** Kaminski, P. and Matus, A. 1998. the impact of urban environments on the growth and histopathological changes of tree sparrow (*passer montanus*) nestlings. *Polish J Environ Stud.* 7(3): 131-151.
- FL** Kamphues, J., Wolf, P., and Rabehl, N. 1997. development of body composition in growing pet birds. <original> die entwicklung der koerperzusammensetzung wachsender ziervoegel. *Uebersichten Zur Tierernaehrung.* V. 25(2) P. 193-194
- FL** Kampov-Polevoi, A. B. and Skal'nyi, A. V. 1989. [a decrease in the acute toxicity of ethanol produced by zinc sulfate]. <original> snizhenie ostroi toksichnosti etanola sul'fatom tsinka. *Biulleten' Eksperimental'Noi Biologii i Meditsiny* 107(3): 317-8.
- No COC** Kanarek, R. B., Marks-Kaufman, R., and Lipeles, B. J. 1980. increased carbohydrate intake as a function of insulin administration in rats. *Physiology & Behavior* 25(5): 779-82.
- Nut** Kanchana, S. and Shurpalekar, K. S. 1989. indian regional diets: zinc content and absorption in rats. *Nutrition Reports International* 39(2): 399-407.
- Nut def** Kanchana, S. and Shurpalekar, Kantha S. effect of fiber and phytate of regional diet on the apparent absorption of zinc in rats. *Nutr. Rep. Int.* (1989) 39(4): 727-34.
- Nut def** Kane, E., Morris, J. G., Rogers, Q. R., Ihrke, P. J., and Cupps, P. T. zinc deficiency in the cat. *J. Nutr.* (1981) 111(3): 488-95.
- No Dose** Kane, Robert E. and Chen, Lee J. 1991. hepatic bile salt sulfotransferases in the rat : sulfation of 3.beta.-hydroxy-5-cholenoate during development. *J. Pediatr. Gastroenterol. Nutr.* 12(2): 260-8 .
- FL** Kang, Baoan, Wang, Zhongbai, and Su, Yin. zinc-65 metabolism of rats fed crops from districts endemic for keshan disease. *Yingyang Xuebao* (1984) 6(4): 331-4.
- BioX** Kang, C. Yong(A), Luo Lizhong, Wainberg Mark A, and Li Yan. 1999. development of hiv/aids vaccine using chimeric gag-env virus-like particles. *Biological Chemistry* 380(3): 353-364.
- Abstract** Kang Chang W, Nam Ki T, and Kang Kyung R. 1995. transfer of dietary zinc in zno or zn-proteinates to chicken eggs. *Poultry Science* 74(SUPPL. 1): 151.
- No COC** Kang, H. K. and Harnish, R. A. zinc nutritional status and response of lethal level of ozone exposure in rats. *Bulletin Of Environmental Contamination And Toxicology* Jan 1979. v. 21 (1/2) p. 206-212. ill.
- Drug** Kang, Han K. and Harnish, Richard A. zinc nutritional status and response to lethal level of ozone exposure in rats. *Bull. Environ. Contam. Toxicol.* (1979) 21(1-2): 206-12 .
- Nut def** Kang, Han K., Harvey, Phillip W., Valentine, Jane L., and Swendseid, Marian E. 1977. zinc, iron, copper, and magnesium concentrations in tissues of rats fed various amounts of zinc. *Clin.*

Chem. (Winston-Salem N. C.) 23(10): 1834-7

- Nut def** Kanke, Yusuke, Suzuki, Kazuharu, Hirakawa, Shun, and Goto, Shiro. oral contraceptive steroids: effects on iron and zinc levels and on tryptophan pyrrolase and alkaline phosphatase activities in tissues of iron-deficient anemic rats. *Am. J. Clin. Nutr.* (1980) 33(6): 1244-50
- Phys** Kanoh, J., Sugimoto, A., and Yamamoto, M. 1995. schizosaccharomyces pombe zfs1+ encoding a zinc-finger protein functions in the mating pheromone recognition pathway. *Molecular Biology of the Cell* 6(9): 1185-95.
- Nut def** Kantheti Prameela, Qiao Xiaoxi, Diaz Maria E, Peden Andrew A, Meyer Gary E, Carskadon Shannon L, Kapfhamer David, Sufalko Damaris, Robinson Margaret S, Noebels Jeffrey L, and Burmeister Margit(A). 1998. mutation in ap-3 delta in the mocha mouse links endosomal transport to storage deficiency in platelets, melanosomes, and synaptic vesicles. *Neuron* 21(1): 111-122.
- No COC** KANWAR, K. C. and SINGH, M. metallic micro nutrients in experimental fluorosis. *IRCS (INT RES COMMUN SYST) MED SCI LIBR COMPEND*; 9 (1). 1981. 60.
- Mix** Kanwar, K. C. and Vig, Paraminderjit S. intestinal absorption of zinc in the fluoridated environment. *IRCS Med. Sci.: Libr. Compend.* (1983) 11(8): 762 .
- No COC** Kanwar, Kuldip C. and Singh, Manohar. zinc depletion following experimental fluorosis in mice. *Sci. Total Environ.* (1981) 22(1): 79-83.
- No COC** Kaplan, E. Ya., Limantsev, A. V., Moshkovskii, Yu. Sh., Palkin, L. L., Tat'yanenko, L. V., Sokolov, I. K., Mashnin, A. I., Viktorov, N. A., Gar, T. K., and Mironov, V. F. the effect of actoprotectors on calcium, magnesium-dependent atpase of sarcoplasmic reticulum from rabbit muscles. *Biol. Nauki (Moscow)* (1987) (7): 33-7 .
- Nut def** Kapp, P. and Simon, F. 1980. ultrastructural cutaneous changes in zinc-depleted pigs. *Acta Veterinaria Academiae Scientiarum Hungaricae* 28(4): 463-471.
- CP** Kapur Jaideep and Macdonald Robert L. 1998. postnatal development of hippocampal dentate granule cell gabaa receptor pharmacological properties. *Society for Neuroscience Abstracts* 24(1-2): 1012.
- Unrel** Kapur, Jaideep and Macdonald, Robert L. postnatal development of hippocampal dentate granule cell .gamma.-aminobutyric acid receptor pharmacological properties. *Mol. Pharmacol.* (1999) 55(3): 444-452.
- Drug** Kapur, Jaideep and Macdonald, Robert L. rapid seizure-induced reduction of benzodiazepine and zn2+ sensitivity of hippocampal dentate granule cell gabaa receptors. *J. Neurosci.* (1997) 17(19): 7532-7540.
- FL** Kara, S. and Yildiz, N. 1988. study on the effects of berovit, and high dietary manganese with zincin broiler growing. *Veteriner Fakultesi Dergisi, Ankara Universitesi* 35(2-3): 227-237.
- No COC** Karaivanova, V. D., Manolov, I., Minassyan, M. L., Danchev, N. D., and Samurova, S. M. 1994. metal complexes of warfarin sodium. *Die Pharmazie* 49(11): 856-7.
- Unrel** Karasawa Takusato, Tabuchi Kouji, Fumoto Masaki, and Yasukawa Tamio(A). 1993. development of simulation models for protein folding in a thermal annealing process: i. a simulation of bpti folding by the pearl necklace model. *Computer Applications in the Biosciences* 9(3): 243-251.

- FL** Karasev, N. F., Chernigov, V. D., and Yanchenko, A. E. 1988. effect of supplementary trace element feeding of animals with hydatigera cysticercosis on quality of mutton and pork. *Veterinarnaya Nauka - Proizvodstvu* (26): 178-180.
- No Dose** Karesh, W. B., Campo, A. del, Braselton, W. E., Puche, H., and Cook, R. A. 1997. health evaluation of free-ranging and hand-reared macaws (ara spp.) in peru. *Journal of Zoo and Wildlife Medicine* 28(4): 368-377.
- CP** Karp Sharon L and Neilson Eric G. 1995. expression of the zinc finger protein eek1 is developmentally regulated in fetal mouse kidney. *Journal of the American Society of Nephrology* 6(3): 698.
- CP** Karr, K. J., Dawson, K. A., Mitchell, G. E. Jr, and Hopkins, D. M. ruminal bacteria growth and proteolytic activity in response to zinc. *83RD ANNUAL MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE, LARAMIE, WYOMING, USA, AUGUST 6-9, 1991. J ANIM SCI.* 69 (Suppl. 1). 1991. 738-739. CP.
- CP** Karr, K. J., Mcleod, K. R., Dawson, K. A., Tucker, R. E., and Mitchell, G. E. Jr. zinc-treated soybean meal as a source of supplemental protein for growing calves. *83RD ANNUAL MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE, LARAMIE, WYOMING, USA, AUGUST 6-9, 1991. J ANIM SCI.* 69 (Suppl. 1). 1991. 529. CP.
- Unrel** Karran, E. H., Dodgson, K., Harris, S. J., Markwell, R. E., and Harper, G. P. 1995. a simple in vivo model of collagen degradation using collagen-gelled cotton buds: the effects of collagenase inhibitors and other agents. *Inflammation Research* 44(1): 36-46.
- CP** Kasarskis, E. J. regulation of zinc homeostasis in rat brain. *The Neurobiology Of Zinc : Proceedings, Symposium, Society For Neuroscience, Boston, Massachusetts, November 4-6, 1983 / Editors, C.j. Frederickson, G.a. Howell, E.j. Kasarskis.* v. 11A p. 27-37.
- Abstract** Kasarskis, E. J. zinc homeostasis in adult rat brain effect of dietary zinc deficiency. *9TH MEETING OF THE INTERNATIONAL SOCIETY FOR NEUROCHEMISTRY, VANCOUVER, B.C., CANADA, JULY 10-15, 1983. J NEUROCHEM.* 41 (Suppl.). 1983. S103.
- Nut def** Kasarskis, E. J. 1984. zinc metabolism in normal and zinc-deficient rat brain. *Experimental Neurology* 85(1): 114-27.
- Bio Acc** Kasarskis, E. J., Forrester, T. M., and Slevin, J. T. 1987 . amygdalar kindling is associated with elevated zinc concentration in the cortex and hippocampus of rats. *Epilepsy Research* 1(4): 227-233.
- CP** Kasarskis, E. J. and Hoekstra, W. G. effect of alterations of zinc status on the zinc content of the gastrointestinal tract of chicks. *Proc. Soc. Exp. Biol. Med.* (1974) 145(2): 508-12.
- Nut def** Kasarskis, Edward J. zinc metabolism in normal and zinc-deficient rat brain. *Exp. Neurol.* (1984) 85(1): 114-27
- Nut def** Kasarskis, Edward J., Sparks, D. L., and Slevin, John T. changes in hypothalamic noradrenergic systems during the anorexia of zinc deficiency. *Biol. Trace Elem. Res.* (1986) 9(1): 25-35 CO
- Abstract** Kasch, P., Hook, J. B., and Bond, J. T. effects of zinc deficiency on carbonic anhydrase activity and renal function. *Federation Proceedings.* 38 (3 Part 1). 1979 605
- FL** Kashiwabara, N. EISOA, Maruyama, H., Yamashita, Y., and Kondo, S. <translated> effects of zinc deficiency on growth, hematological values, and tissue zinc content in rats. *Eiyo To*

Shokuryo = ; *Journal Of Japanese Society Of Food And Nutrition*. 1982. v. 35 (4) p. 281-290. ill.

- Nut def** Kashiwabara, Norio, Maruyama, Hirotaka , Yamashita, Yoshiko, and Kondo, Satoru. 1983. effects of zinc deficiency on enzyme activities, hormones, glucose, lipids and nitrogen compounds contents in serum of rats. *Nippon Eiyo Shokuryo Gakkaishi* 36(1): 5-13 .
- FL** Kashiwabara, Norio, Maruyama, Hirotaka, Yamashita, Yoshiko, and Kondo, Satoru. effects of zinc deficiency on growth , hematological values, and tissue zinc contents in rats. *Eiyo to Shokuryo (1982)* 35(4): 281-90.
- Diss** Kasim, Azhar Bin. 1998. dietary animal proteins effect on cholecalciferol requirement and zinc utilization, and corn particle size effect on phytate phosphorus utilization by broiler chicks. Avail.: UMI. Order No. DA9836965 From: *Diss. Abstr. Int., B* 1998, 59. 6. 2499. Unavailable : 126 p.
- Nut def** Kaswan, Sarawati and Bedwal, R. S. light and electron microscopic changes in the ovary of zinc deficient balb/c mice. *Indian J. Exp. Biol.* (1995) 33(7): 469-79.
- FL** Kaszper, B. Wojciech, Piotrowski, Jerzy K., Marciniak, Wieslawa, and Sielczynska, Malgorzata. comparative study of the level of metallothionein-like proteins, cadmium, and zinc in the liver and kidneys of rats. *Bromatol. Chem. Toksykol.* (1976) 9(3): 315-26.
- FL** Katakura, Michihiro and Sugawara, Naoki . preventive effect of selenium against the testicular injury by cadmium. *Nippon Eiseigaku Zasshi* (1999) 54(2): 481-489
- FL** Katayama, T. 1967. [effect of a glucocorticoid on the islet of langerhans]. *Nippon Naibunpi Gakkai Zasshi* 43(9): 896-904.
- Mix** Katch, K. and Nokata, M. 1973. effect of some minerals on the copper metabolism of the rat. *Japanese Journal of Zootechnical Science* 44(8): 460-461.
- FL** Katic, R., Katrinka, M., Jovanovic, M. J., and Mijatov, L. 1984. immunostimulant effect of zinc sulphate on the immune response of sheep and rabbits to foot rot vaccine. *Veterinarski Glasnik* 38(11): 919-923.
- FL** Katic, R. V., Katrinka, M., Odri, S., Jovanovic, M. J., Petrov, T., Jacimovic, S., and Deak, J. 1986. field trial of "antikornulezin" for preventing foot rot in sheep. *Veterinarski Glasnik* 40(7/8): 555-559.
- Alt** Kato, K., Isaji, S., Kawarada, Y., Hibasami, H., and Nakashima, K. 1997. effect of zinc administration on pancreatic regeneration after 80% pancreatectomy. *Pancreas* 14(2): 158-65.
- Nut def** Kato, Norihisa, Saari, Jack T., and Schelkoph, Gwen M. cystine feeding enhances defects of dietary copper deficiency by a mechanism not involving oxidative stress. *J. Nutr. Biochem.* (1994) 5(2): 99-105.
- Nut def** Katoh, Keisuke and Nokata, Masaru. effect of dietary zinc on the copper metabolism of the rat. *Nippon Chikusan Gakkai-Ho* (1974) 45(6): 361-6 .
- Nut def** Katoh, Keisuke and Nokata, Masaru. effect of some minerals on the copper metabolism of the rat. *Nippon Chikusan Gakkai-Ho* (1973) 44(8): 460-1 CODEN: NICKA3.
- Drug** Katsumata, T., Masaoka, T., Shirai, M., Tsuboi, T., and Akahori, F. growth retardation by a semisynthetic diet and its prevention by biotin in the rat. *Biomed. Res. Trace Elem.* (1991)

- Drug** Katz, B. A., Clark, J. M., Finer-Moore, J. S., Jenkins, T. E., Johnson, C. R., Ross, M. J., Luong, C., Moore, W. R., and Stroud, R. M. 1998. design of potent selective zinc-mediated serine protease inhibitors. *Nature* 391(6667): 608-12.
- No COC** Kaukas, A., Hinton, M., and Linton, A. H. 1988. the effect of growth-promoting antibiotics on the faecal enterococci of healthy young chickens. *The Journal Of Applied Bacteriology*. 64(1): 57-64.
- CP** Kaul L(A) and Ahluwalia, B. 1994. protein phosphorylation inhibition by zinc in sperm head membranes in boar spermatozoa. *FASEB Journal* 8(4-5): A716.
- Nut** Kaup, Susan M., Greger, J. L., and Lee, Ken. nutritional evaluation with an animal model of cottage cheese fortified with calcium and guar gum. *J. Food Sci. (1991)* 56(3): 692-5.
- HHE** Kaur Gurjit, Nath Ravindra(A), and Gupta, G. S. 1993. purification and characterization of low molecular weight metal binding protein from human testes. *Journal of Trace Elements in Experimental Medicine* 6(1): 1-13.
- Surv** Kaur S. 1989. accumulation of lead, zinc and cadmium in the nestling feathers of hoopoe upupa eops. *JOURNAL OF THE BOMBAY NATURAL HISTORY SOCIETY*. 86(2): 244-245, illustr.
- FL** Kaushish, S. K. and Sahni, K. L. 1974? the effect of cooler climate and feeding of animal proteins and traceminerals on the semen production of russian merino rams during summerseason. <Document Title>Annual Report, 1973. Central Sheep and Wool ResearchInstitute. 43-45.
- Mix** Kaushishi, S. K. and Sahni, K. L. effect of feeding animal protein (egg + milk) and trace elements, and provision of cooler climate on libido, semen quality and certainphysiological reactions of russian merino rams during summer season.
- HHE** Kavanagh, J. P. 1983. zinc-binding properties of human prostatic tissue, prostatic secretion and seminal fluid. *Journal Of Reproduction & Fertility* 68(2): 359-363.
- Nut def** Kavlock, R. J. experimental studies on chemical inducing eye abnormalities. *Teratology* 1996 May;53(5):15A
- FL** Kawaai, Yoshie, Shinoda, Shoko, Yamamoto, Yoshihiro, and Yoshida, Tsutomu. effects of sodium phytate addition to germfree and conventionalized rats on growth and mineral balance. *Tachikawa Tandai Kiyo (1985)* : 18, 53-8.
- Unrel** Kawabata Shun-Ichiro(A), Nakagawa Kazunori, Muta Tatsushi, Iwanaga Sadaaki, and Davie Earl W. 1993. rabbit liver microsomal endopeptidase with substrate specificity for processing proproteins is structurally related to rat testes metalloendopeptidase 24.15. *Journal of Biological Chemistry* 268(17): 12498-12503.
- In Vit** Kawahara Fumio, Saito Hiroshi, and Katsuki Hiroshi(A). 1993. pharmacological characteristics of gaba-a responses in postnatal suprachiasmatic neurons in culture. *Neuroscience Letters* 160(1): 45-48.
- Gene** Kawajiri Shinichi and Dingledine Raymond(A). 1993. multiple structural determinants of voltage-dependent magnesium block in recombinant nmda receptors. *Neuropharmacology* 32(11): 1203-1211.
- Abstract** Kawamoto, J., Castonguay, T. W., Keen, C. L., Stern, J. S., and Hurley, L. S. age and sex alter the

effects of zinc deficiency on food intake in rats. *68TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 1-6, 1984 FED PROC.* 43 (3). 1984. Abstract 2348.

- Nut def** Kawamoto, Jerrolynn C., Castonguay, Thomas W., Keen, Carl L., Stern, Judith S., and Hurley, Lucille S. age, sex and reproductive status alter the severity of anorexia in zinc deficient rats. *Physiol. Behav.* (1986) 38(4): 485-93.
- Nut def** Kawamoto, Jerrolynn C. and Halas, Edward S. lasting morphologic effects of mild perinatal zinc deficiency in the adult hippocampal formation. *Neurol. Neurobiol.* (1984) 11B(Neurobiol. Zinc, Part B): 33-48.
- No COC** Kawana, E., Akert, K., and Sandri, C. 1969. zinc iodide-osmium tetroxide impregnation of nerve terminals in the spinal cord. *Brain Research* 16(2): 325-31.
- Alt** KAWANISHI, H., NISHIKI, M., TSUCHIYA, T. , and EZAKI, H. function of trace metal in experimental fulminant hepatic failure: special reference to variation in zinc content in liver. *HIROSHIMA J MED SCI*; 33 (1). 1984. 27-34.
- No Tox** Kawanishi, Hideki, Nishiki, Masayuki, Ezaki, Haruo, and Tsuchiya, Taro. 1982. changes in the concentration of trace metal in experimental fulminant hepatic failure with special reference to changes in the zinc content in liver. *Kanzo* 23(9): 998-1005 .
- FL** Kawatra, B. L. and Kaur, Sukhdeep. availability of zinc from germinated, fermented and autoclaved black-gram (*phaseolus mungo*) in rats. *Nahrung* (1989) 33(4): 311-14 .
- Nut def** Kawatra, B. L. and Maingi, S. B. effect of dietary zinc on the utilization of .beta.-carotene in rats. *J. Res. (Punjab Agric. Univ.)* (1979) 16(4): 457-60.
- FL** Kawecki, Arkadiusz, Rotenberg, Samuel, and Czajczynska, A. 1966. the effect of cobalt and zinc on the growth and development of chickens. *Zesz. Nauk. Wyzsz. Szk. Roln. Szczecinie* : 20, 57-70 .
- Bio Acc** Kaya, Sule, Ortatatli, M., and Haliloglu, S. 2002. feeding diets supplemented with zinc and vitamin a in laying hens: effects on histopathological findings and tissue mineral contents. *Research in Veterinary Science.* 73(3): 251-257.
- Nut def** Kayama, F., Matsuno, K., and Kodama, Y. impairment of immune functions induced by zinc deficiency. *Biomed. Res. Trace Elem.* (1990) 1(2): 197-8
- Acu** Kazacos, E. A. and Van Vleet JF. sequential ultrastructural changes of the pancreas in zinc toxicosis in ducklings. *Am J Pathol*; 134 (3). 1989. 581-596.
- FL** Kazakova, T. N., Tokarev, A. S., and Lavrinenko, R. I. 1984. dietary zinc level and vitamin a deposition in turkeys. *Veterinariya, Moscow, USSR* (10): 53-54.
- Abstract** Kearney, R. D., Connolly, J. F., Mckenna, L., Flynn, A., and Cremin, F. M. bioavailability of calcium and zinc from whey calcium phosphate complex. *2ND ANNUAL RESEARCH MEETING OF THE NATIONAL COMMITTEE FOR NUTRITIONAL SCIENCES, ROYAL IRISH ACADEMY, DUBLIN, IRELAND, AUG. 27, 1985. IR J FOOD SCI TECHNOL.* 9 (2). 1985 (Recd. 1986). 141.
- HHE** Keating, J. N., Wada, L., Stokstad, E. L., and King, J. C. 1987. folic acid: effect on zinc absorption in humans and in the rat. *American Journal of Clinical Nutrition* 46(5): 835-9.

- HHE** Keating, James N., Wada, Leslie, Stokstad, E. L. R., and King, Janet C. folic acid: effect on zinc absorption in humans and in the rat. *Am. J. Clin. Nutr.* (1987) 46(5): 835-9.
- FL** Kechrid Z(A), Saka S(A), and Bouzerna N(A). 1998. effect of reduced dietary zinc intake on carbohydrate and zinc metabolism in non-diabetic mice: i. heterozygous c57bl/ksjdb/+, homozygous c57bl/ksjdb+/+ and the original strain c57bl/ksj. *Dokladi Na B"Lgarskata Akademiya Na Naukite* 51(9-10): 111-116.
- Alt** Kedziora-Kornatowska K(A). 1999. effect of angiotensin convertase inhibitors and at1 angiotensin receptor antagonists on the development of oxidative stress in the kidney of diabetic rats. *Clinica Chimica Acta* 287(1-2): 19-27.
- Nut def** Keen, C. L., Cohen, N. L., Hurley, L. S., and Lonnerdal, B. 1984. molecular localization of copper and zinc in rat fetal liver in dietary and drug-induced copper deficiency. *Biochemical And Biophysical Research Communications*. 118 (3): 697-703.
- Nut def** Keen, C. L. and Golub, M. S. 1998. hematology parameters in female adolescent monkeys: effect of iron-zinc deficiency and a beef protein supplement. *FASEB Journal* 12(4): A219.
- Bio Acc** Keen, C. L. and Hurley, L. S. 1980. developmental (age-related) changes in concentrations of iron, copper, and zinc in mouse tissues (nutrition). *Mechanisms Of Ageing And Development*. 13 (2): 161-176.
- Nut def** Keen, C. L. and Hurley, L. S. 1987. effects of zinc-deficiency on prenatal and postnatal-development. *Neurotoxicology* 8(3): 379-387.
- CP** Keen, C. L., Lonnerdal, B., and Hurley, L. S. developmental changes in zinc and copper in mouse and rat tissues. *Trace Elem. Metab. Man Anim. Proc. Int. Symp.*, 4th (1982): Meeting Date 1981, 287-90. Editor(s): Gawthorne, J. M.; Howell, J. McC.; White, C. L. Publisher: Springer, Berlin, Fed. Rep. Ger..
- Bio Acc** Keen, C. L., Lonnerdal, B., and Fisher, G. L. seasonal variations and the effects of age on serum copper and zinc values in the dog (dietary intake). *American Journal Of Veterinary Research*. Feb 1981. v. 42 (2) p. 347-350. ill.
- Prim** Keen, C. L., Lonnerdal, B., Golub, M. S., Uriu-Hare, J. Y., Olin, K. L., Hendrickx, A. G., and Gershwin, M. E. 1989. influence of marginal maternal zinc deficiency on pregnancy outcome and infant zinc status in rhesus monkeys. *Pediatric Research* 26(5): 470-7.
- CP** Keen, C. L., Lonnerdal, B., and Hurley, L. S. 1980. developmental-changes in the molecular-distribution of copper and zinc in rat-tissues. *Federation Proceedings* 39: 1749.
- CP** Keen, C. L., Lonnerdal, B., and Hurley, L. S. teratogenicity of dietary and drug induced copper deficiency an integrated approach. *THE TERATOLOGY SOCIETY 22ND ANNUAL MEETING, FRENCH LICK, IND., USA, JUNE 6-10, 1982, TERATOLOGY*. 25 (2). 1982. 53a.
- Nut def** Keen, C. L., Mark-Savage, P., Lonnerdal, B., and Hurley, L. S. teratogenic effects of d-penicillamine in rats: relation to copper deficiency (zinc). *Drug-Nutrient Interactions*. 1983. v. 2 (1) p. 17-34. ill.
- Abstract** KEEN, C. L., MASTERS, D. G., LONNERDAL, B., And HURLEY, L. S. maternal-fetal partitioning of zinc and copper under conditions of dietary deficiency. *TERATOLOGY* 27(2):55A-56A,1983
- Abstract** KEEN, C. L., MUTCH, P. B., LOENNERDAL, B., AMEMIYA, K., and HURLEY, L. S. effect

of zinc supplementation on magnesium deficiency in pregnant rats. *TERATOLOGY* 23:44A-45A,1981

- CP** Keen, C. L., Olin, K. L., Golub, M. S., Lonnerdal, B., Graham, T., and Gershwin, M. E. influence of dietary zinc intake on pregnancy outcome in rhesus monkeys. *75TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ATLANTA, GEORGIA, USA, APRIL 21-25, 1991. FASEB (FED AM SOC EXP BIOL) J.* 5 (5). 1991. A937.
- Nut def** Keen, C. L., Rogers, J. M., Reinstein, N., and Hurley, L. S. 1984. maternal zinc nutriture during pregnancy and lactation in the rat - determination of marginal level of dietary zinc. *Teratology* 29: A40.
- Drug** Keen, C. L., Saltman, P., and Hurley, L. S. 1980. copper nitrilotriacetate: a potent therapeutic agent in the treatment of a genetic disorder of copper metabolism. *American Journal of Clinical Nutrition* 33(8): 1789-1800.
- Nut def** Keen, Carl L., Cohen, Nancy L., Hurley, Lucille S., and Lonnerdal, Bo. molecular localization of copper and zinc in rat fetal liver in dietary and drug-induced copper deficiency. *Biochem. Biophys. Res. Commun.* (1984) 118(3): 697-703 .
- No COC** Keen, Carl L., Cohen, Nancy L., Lonnerdal, Bo, and Hurley, Lucille S. low tissue copper and teratogenesis in trientine-treated rats. *Lancet* (1982) 1(8281): 1127.
- No Dose** Keen, Carl L. and Hurley, Lucille S. developmental changes in concentrations of iron, copper, and zinc in mouse tissues. *Mech. Ageing Dev.* (1980) 13(2): 161-76 .
- Nut def** Keen, Carl L. and Hurley, Lucille S. zinc absorption through skin: correction of zinc deficiency in the rat. *Am. J. Clin. Nutr.* (1977) 30(4): 528-30.
- No Tox** Keen, Carl L., Loennerdal, Bo, and Fisher, Gerald L. age-related variations in hepatic iron, copper, zinc, and selenium concentrations in beagles. *Am. J. Vet. Res.* (1981) 42(11): 1884-7 .
- OAC** Keen, Carl L., Loennerdal, Bo, Sloan, Martin V., and Hurley, Lucille S. effects of milking procedure on rat milk composition. *Physiol. Behav.* (1980) 24(3): 613-15 .
- No Tox** Keen, Carl L., Lonnerdal, Bo, and Fisher, Gerald L. seasonal variations and the effects of age on serum copper and zinc values in the dog. *Am. J. Vet. Res.* (1981) 42(2): 347-50.
- Nut def** Keen, Carl L., Lonnerdal, Bo, Golub, Mari S., Olin, Katherine L., Graham, Thomas W., Uriu-Hare, Janet Y., Hendrickx, Andrew G., and Gershwin, M. Eric. effect of the severity of maternal zinc deficiency on pregnancy outcome and infant zinc status in rhesus monkeys. *Pediatr. Res.* (1993) 33(3): 233-41
- Mix** Keen, Carl L., Lonnerdal, Bo, Sloan, Martin V., and Hurley, Lucille S. effect of dietary iron, copper and zinc chelates on nitrilotriacetic acid (nta) on trace metal concentrations in rat milk and maternal and pup tissues. *J. Nutr.* (1980) 110(5): 897-906 .
- Nut def** Keen, Carl L., Mutch, Patricia B., Loennerdal, Bo, Amemiya, Kenjie, and Hurley, Lucille S. effect of zinc supplementation on magnesium deficiency during pregnancy in rats. *Magnesium* (1984) Volume Date 1983, 2(3): 113-19.
- Nut def** Keen, Carl L., Reinstein, Nancy H., Goudey-Lefevre, Jo, Lefevre, Michael, Lonnerdal, Bo, Schneeman, Barbara O., and Hurley, Lucille S. effect of dietary copper and zinc levels on tissue copper, zinc, and iron in male rats. *Biol. Trace Elem. Res.* (1985) 8(2): 123-36

- Nut** Kegley, B. and Silzell, S. 1999. the immune response and performance of calves supplemented with zinc from an organic and an inorganic source. *Research Series - Arkansas Agricultural Experiment Station* (464): 98-101.
- Unrel** Kegley, E. B., Harvey, R. W., Spears, J. W., and Crickenberger, R. G. 1990. the effects of lysocellin and varying calcium levels on performance and ruminal and plasma characteristics of growing beef steers fed corn silage. *Journal of Animal Science* 68(2): 483-489.
- Abstract** Kegley, E. B., Kreider, D. L., Coffey, K. P., Silzell, S. A., and Galloway, D. L. 1997. immune response and performance of heifers supplemented with zinc from an organic and an inorganic source. *Journal of Animal Science* 75(SUPPL. 1): 250.
- Nut** Kegley, E. B. and Spears, J. W. 1994. effect of zinc supplementation on performance and zinc metabolism of lambs fed forage-based diets. *Journal of Agricultural Science* 123(2): 287-292.
- CP** Kegley, E. B. and Spears, J. W. performance and mineral metabolism of lambs as affected by source of zinc sulfate or methionine and level of zinc. *MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE AND INTERNATIONAL SOCIETY OF APPLIED ETHOLOGY, PITTSBURGH, PENNSYLVANIA, USA, AUGUST 8-11, 1992. J ANIM SCI.* 70 (Suppl. 1). 1992. 302.
- Surv** Keith, J. O. and Bruggers, R. L. 1998. review of hazards to raptors from pest control in sahelian africa. *Journal of Raptor Research* 32(2): 151-158.
- Nut def** Keith, M. O. and Bell, J. M. 1987. effects of canola meal on tissue trace mineral concentrations in growing pigs. *Canadian Journal of Animal Science* 67(1): 133-140.
- In Vit** Kelder, Bruce, Chen, Howard, and Kopchick, John J. activation of the mouse metallothionein-i promoter in transiently transfected avian cells. *Gene* (1989) 76(1): 75-80.
- Unrel** Keller, J. M., Cherroret, G., Colin, S., Durand, I., Dauca, M., and Lehr, P. R(A). 1992. evaluation of the elements in the intestinal epithelial cells of rat during development: an x-ray microanalysis study. *European Archives of Biology* 103(3): 187-193.
- CP** Keller, K. A(A), Coffield, J. A., and Grider, A. 1999. behavioral and biochemical analyses of the effects of various forms of dietary zinc in the CNS. *FASEB Journal* 13(4 PART 1): A223.
- Nut def** Keller, P. R. and Fraker, P. J. 1986. gestational zinc requirement of the a/j mouse: effects of a marginal zinc deficiency on in utero B-cell development. *Nutrition Research* 6(1): 41-50.
- Nut def** Keller, Paul R. and Fraker, Pamela J. gestational zinc requirement of the a/j mouse : effects of a marginal zinc deficiency on in utero B-cell development. *Nutr. Res. (N. Y.)* (1986) 6(1): 41-50
- Nut** Kelley, K. W., Easter, R. A., <Editors> Miller, E. R., Ullrey, D. E., and Lewis, A. J. 1991. nutritional and environmental influences on immunocompetence. <document title>swine nutrition. 401-413.
- Prim** Kelley, M. A., Bugg, J. L. Jr, and Skjonsby, H. S. 1973. histologic evaluation of formocresol and orthoparapulpotomies in rhesus monkeys. *Journal of the American Dental Association* 86(1): 123-7.
- Diss** Kelley, R. W. 1983. effects of subtherapeutic doses of antibiotics on poultry intestinal bacteria. *Dissertation Abstracts International, B* 44(2): 414.
- Unrel** Kellogg, D. W. 1990. zinc methionine affects performance of lactating cows. *Feedstuffs*

62(35): 15, 16, 28.

- CP** Kellogg, D. W., Bayley, P., and Johnson, Z. effect of zinc methionine or zinc oxide plus racemic methionine on growth of holstein calves. *68TH ANNUAL MEETING OF THE AMERICAN DAIRY SCIENCE ASSOCIATION, SOUTHERN BRANCH, FEBRUARY 2-6, 1991. J DAIRY SCI. 74 (Suppl. 1). 1991. 297.*
- Abstract** Kellogg, D. W., Rakes, J. M., and Gliedt, D. L. effect of supplementing zinc methionine in diet of lactating dairy cows. *66TH ANNUAL MEETING OF THE AMERICAN DAIRY SCIENCE ASSOCIATION SOUTHERN BRANCH, NASHVILLE, TENNESSEE, USA, FEBRUARY 3-8, 1989. J DAIRY SCI. 72 (8). 1989. 2210.*
- Mix** Kellogg, D. W., Rakes, J. M., and Gliedt, D. W. effect of zinc methionine supplementation on performance and selected blood parameters of lactating dairy cows. *Nutrition Reports International. 40 (6). 1989. 1049-1058.*
- Nut def** Kelly, Edward J., Quaife, Carol J., Froelick, Glenda J., and Palmiter, Richard D. metallothionein i and ii protect against zinc deficiency and zinc toxicity in mice. *J. Nutr. (1996) 126(7): 1782-1790.*
- CP** Kelly Edward J(A), Quaife Carol J, and Palmiter Richard D. 1995. studies on the role of metallothionein in zinc and copper homeostasis by manipulation of the mouse genome. *Journal of Cellular Biochemistry Supplement 0(21A): 249.*
- Org Met** Kelner Michael J(A) and Uglik Slavomir F. 1995. superoxide dismutase abolishes the platelet-derived growth factor-induced release of prostaglandin e-2 by blocking induction of nitric oxide synthase: role of superoxide. *Archives of Biochemistry and Biophysics 322(1): 31-38.*
- HHE** Kelsay, J. L. effect of fiber and oxalic-acid on zinc balance of adult human subjects. *183RD ACS (AMERICAN CHEMICAL SOCIETY) NATIONAL MEETING, LAS VEGAS, NEV., USA, MARCH 28-APRIL 2, 1982. ABSTR PAP AM CHEM SOC. 183 (0). 1982. Agfd-6.*
- HHE** Kelsay, J. L. 1983. effect of fiber and oxalic-acid on zinc balance of adult humans. *Acs Symposium Series 210: 127-143.*
- No COC** Kemplay, S. 1984. effects of dithiobiuret intoxication on motor end plates in sternocostalis and hindlimb muscles of female rats. *Acta Neuropathologica 65(1): 77-84.*
- Unrel** Kempson, S. A. and Laing, J. A. ed. 1991. the role of nutrition in the growth and structure of the hoof horn. prevention, management and repair of trauma in transport animals. *P. 51-59*
- Gene** Kennedy, D., Ramsdale, T., Mattick, J., and Little, M. 1996. an rna recognition motif in wilms' tumour protein (wt1) revealed by structural modelling. *Nature Genetics 12(3): 329-31.*
- Unrel** Kennedy, G. Y. and Vevers, H. G. 1973. eggshell pigments of the araucano fowl. *Comparative Biochemistry and Physiology 44(1): 11-25.*
- Abstract** KENNEDY, M., LONNERDAL, B., REISENAUER, A., and HALSTED, C. H. 1988. zinc uptake into intestinal brush border membrane vesicles of alcoholic pigs. *TWENTY-EIGHTH ANNUAL MEETING OF THE AMERICAN SOCIETY FOR CLINICAL NUTRITION*
- Nut** Kennedy, M. L. and Failla, M. L. 1987. zinc metabolism in genetically obese (ob/ob) mice. *The Journal Of Nutrition. 117(5): 886-893.*
- CP** Kenney, M. A., Hill, L., McCoy, H., and Williams, L. effect of dietary zinc on bone in calcium-

deficient rats. 74TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, PART II, WASHINGTON, D.C., USA, APRIL 1-5, 1990. FASEB (FED AM SOC EXP BIOL) J. 4 (4). 1990. A1046.

- Nut def** Kenney, Mary Alice and McCoy, Harriett. adding zinc reduces bone strength of rats fed a low-calcium diet. *Biol. Trace Elem. Res.* (1997) 58(1 and 2): 35-41 .
- CP** Kenny, A. D. 1972. effect of dietary acetazolamide on plasma electrolytes, bone mass, and renal mineral contents in rats. *Proceedings of the Society for Experimental Biology and Medicine*; 140
- Nut** Kensett, B. C., Ho, S. K., and Touchburn, S. P. 1980. influence of level of dietary fat on the growth of dwarf chickens. *Poultry Science* 59(9): 2065-70.
- Gene** Kent, J., Coriat, A. M., Sharpe, P. T., Hastie, N. D., and van Heyningen, V. 1995. the evolution of wt1 sequence and expression pattern in the vertebrates. *Oncogene* 11(9): 1781-92.
- FL** Kenzhegalieva, M. A. and Baiturin, M. A. effect of the level of a complex of trace elements (copper, manganese, cobalt, zinc, and iodine) on the growth and development of chicks in the semipalatinsk region. *Tr. Alma-At. Zoovet. Inst.* (1974) : 30, 34-7 .
- Unrel** KEPPEN, L., PYSHER, T., and RENNERT, O. teratogenic effects of alcohol are potentiated by zinc deficiency. *CLIN RES* 31:893A,1983
- In Vit** Keppen, L. D., Cannon, D. J., and Moore, D. J. 1986. role of dietary zinc content in alcohol embryopathy in mice. *Clinical Research* 34: A235.
- Drug** Keppen, L. D., Moore, D. J., and Cannon, D. J. the role of zinc nutrition in fetal alcohol syndrome. *Neurotoxicology* 1990;11(1):151
- Unrel** Keppen, L. D., Pysher, T., and Rennert, O. M. 1985. zinc deficiency acts as a co-teratogen with alcohol in fetal alcohol syndrome. *Pediatric Research* 19(9): 944-7.
- Drug** Keppen, Laura Davis, Moore, Donald J., and Cannon, Donald J. zinc nutrition in fetal alcohol syndrome. *Neurotoxicology* (1990) 11(2): 375-80
- Unrel** Keppen, Laura Davis, Pysher, Theodore, and Rennert, Owen M. zinc deficiency acts as a co-teratogen with alcohol in fetal alcohol syndrome. *Pediatr. Res.* (1985) 19(9): 944-7 CODEN.
- Nut def** Kerimova, M. G. effect of diets containing different amounts of copper and zinc on the balance of these trace elements in an animal. *Azerb. Med. Zh.* (1970) 47(10): 66-9
- FL** Kerimova, M. G. importance of a balanced content of copper and zinc in food rations for some characteristics of the nitrogen metabolism in the animal organism. *Vop. Pitan.* (1972) 30(4): 29-34
- FL** Kerimova, M. G. 1972. [the importance of copper and zinc balance in food rations for various indices of nitrogen metabolism in the animal body]. <original> znachenie sbalansirovannosti v pishchevykh ratsionakh medi i tsinka dlia nekotorykh pokazatelei azotistogo obmena zhivotnogo organizma. *Voprosy Pitaniia* 31(4): 29-34.
- FL** Kerimova, M. G. 1972. importance of the balance of copper and zinc in the diet for some indices of nitrogen metabolism in animals. *Voprosy Pitaniya* 31(4): 29-34.
- Fate** Kern, S. R., Smith, H. A., Fontaine, D., and Bryan, S. E. 1981. partitioning of zinc and copper in fetal liver subfractions: appearance of metallothionein-like proteins during development.

Toxicology and Applied Pharmacology 59(2): 346-54.

- No Dose** Kern, Sidney R., Smith, Harry A., Fontaine, David, and Bryan, Sara E. partitioning of zinc and copper in fetal liver subfractions: appearance of metallothionein-like proteins during development. *Toxicol. Appl. Pharmacol.* (1981) 59(2): 346-54
- Unrel** Kerr, J. E., Beck, S. G., and Handa, R. J. 1996. androgens selectively modulate c-fos messenger rna induction in the rat hippocampus following novelty. *Neuroscience* 74(3): 757-66.
- No Oral** Kershaw, William C., Lehman-McKeeman, Lois D., and Klaassen, Curtis D. 1990. hepatic isometallothioneins in mice : induction in adults and postnatal ontogeny. *Toxicol. Appl. Pharmacol.* 104(2): 267-75.
- In Vit** Kesslak, J. P., Frederickson, C. J., and Gage, F. H. 1987. quantification of hippocampal noradrenaline and zinc changes after selective cell destruction. *Experimental Brain Research. Experimentelle Hirnforschung.*
- FL** Kessler, J., Faria, A. de, and Jost, M. 1996. organic zinc compounds in piglet feeding. *Agrarforschung* 3(11/12): 547-550.
- FL** Kessler, J. and Gutzwiller, A. 1988. influence of a concentrate with a high zinc content (protec) on the metabolism of lactating dairy cows. <original> quelle quantite de zinc la vache laitiere tolere-t-elle? *Revue Suisse D'Agriculture.* V. 20(6) P. 339-343
- Nut def** Keszler, P., Boros, I., Sas, B., and Zelles, T. effect of zinc deficient diet on carbonic anhydrase activity and zinc content of the salivary glands of rats. *Acta Physiologica Academiae Scientiarum Hungaricae.* 51 (1/2). 1978 137-138
- Nut def** Keszler, P., Boros, I., Sas, B., and Zelles, T. 1978. effect of zinc-deficient diet on carbonic-anhydrase (ca) activity and zinc content of salivary-glands of rats. *Acta Physiologica Academiae Scientiarum Hungaricae* 51: 137-138.
- No Dose** Ketchenson, Marion R., Barron, George P., and Cox, Dennis H. relation of maternal dietary zinc during gestation and lactation to development and zinc, iron, and copper content of the postnatal rat. *J. Nutr.* (1969) 98(3): 303-11 .
- Nut def** Ketelsen, Sandra Mills, Stuart, Mary A., Weaver, Connie M., Forbes, Richard M., and Erdman, John W. Jr. bioavailability of zinc to rats from defatted soybean flour, acid-precipitated soybean concentrate and neutralized soybean concentrate as determined by intrinsic and extrinsic labeling techniques . *J. Nutr.* (1984) 114(3): 536-42.
- HHE** Keyes, Patricia Jane. 1978. influence of dietary zinc and penicillamine on mineral retention in rats and in a human with wilson's disease. *Avail.: Univ. Microfilms Int. Order No. 7900151 From: Diss. Abstr. Int. B* 1979, 39. 7. 3247-8. 139 pp.
- HHE** Keyzer, J. J., Oosting, E., Wolthers, B. G., and Muskiet, F. A. J. 1983. zinc-absorption after oral-administration of zinc-sulfate. *Pharmaceutisch Weekblad-Scientific Edition* 5(5): 252-253.
- Bio Acc** Keyzer, J. J., Oosting, E., Wolthers, B. G., Muskiet, F. A. J., Hindriks, F. R., and Vanderslik, W. 1983. zinc in plasma and serum - influence of contamination due to the collection tubes. *Pharmaceutisch Weekblad-Scientific Edition* 5(5): 248-251.
- Nut def** Kfoury, George A., Reinhold, John G., and Simonian, Simon J. enzyme activities in tissues of zinc-deficient rats. *J. Nutr.* (1968) 95(1): 102-10

- Nut** Khaled, N. F(A), Illek, J., and Gajdusek, S. 1999. interactions between nutrition, blood metabolic profile and milk composition in dairy goats. *Acta Veterinaria Brno* 68(4): 253-258.
- Nut** Khalifa, T. A. A. 1997. effect of vitamin e and zinc supplementation on sexual behaviour and some semen characteristics of buffalo-bulls. 245 P.
- Phys** Khalil-Manesh, F., Tartaglia-Erler, J., and Gonick, H. C. 1994. experimental model of lead nephropathy. iv. correlation between renal functional changes and hematological indices of lead toxicity. *Journal of Trace Elements and Electrolytes in Health and Disease* 8(1)
- FL** Khalmuradov, A. G., Chagovets, R. V., and Donchenko, G. V. 1969. [the effect of 3-methylpyridine on the pyridine coenzyme and ubiquinone content in the tissues of normal and pp-avitaminotic rats]. <original> vliianie 3-metilpiridina na sodержanie piridinovykh kofermentov i ubikhinona v tkaniakh normal'nykh krys i krys s pp-avitaminozom. *Voprosy Pitaniia* 28(3): 40-3.
- No COC** Khan, A. A. field trial of some rodenticides against the collared pika, ochotona rufescens in apple orchard. *Int.Pest Control.*: 12-13.
- Abstract** Khan, A. A. 1987. problem of field-rats in standing paddy in pakistan and its economic impact on yield losses. 1 P.
- Org Met** Khan, A. A., Munir, S., and Shakoori, A. R. 1998. development of under-ground baiting techniques for control of rats in rice fields in pakistan. *International Biodeterioration & Biodegradation*. 42(2/3): 129-134.
- No COC** Khan, A. A. and Ahmad M. 1991. field efficacy of the second generation anticoagulants, zinc phosphide and bromethalin against meriones hurrianae jerdon. *Indian J.Plant Prot.* 19(1): 43-48.
- No COC** Khan, A. A. Munir S. and Shakoori A. R. 1998. development of under-ground baiting technique for control of rats in rice fields in pakistan. *Int.Biodeterior.Biodegrad.* 42(2/3): 129-134.
- Nut def** Khan, Alam and Weaver, Connie M. bioavailability of zinc to rats from soybeans and casein as affected by protein source and length of adaptation. *Nutr. Res. (N. Y.)* (1989) 9(3): 327-36 .
- Nut** Khan, Aqueel, Vohra, P. N., and Kratzer, F. H. the effect of protein level and dietary guar gum and pectin on copper and zinc utilization in chicks. *Nutr. Rep. Int.* (1987) 36(1): 193-200.
- Abstract** Khan, M. A., Earl, F. L., Heald, F. P., and Hsu, J. M. 1978. effects of castration and atherogenic diet on serum cholesterol trace elements and amino-acids of mini pigs. *Federation Proceedings*. 37(3): 630.
- No COC** Khan, M. L., Ullah, I., and Javed, M. T. 1992. comparative study of probiotics, t. m. 50 biovin-40 and albac on theperformance of broiler chicks. *Pakistan Veterinary Journal* 12(3): 145-147.
- Mineral** Khan, S., Bakhsh, R., Khan, S., and Khan, M. M. effect of different brans on serum glucose fecal sterol and mineral absorpion in male albino rats. *SCI KHYBER*. 3 (1). 1990. 11-16.
- Nut** Khanagwal, P., Mandal, A. B., and Ghosh, J. D. 1998. effect of dietary calcium and zinc levels and coccidial infection on carcass traits in broilers. *Indian Journal of Poultry Science* 33(3): 289-296.
- Nut** Khanagwal, Poonam, Ghosh, J. D., and Mandal, A. B. 1996. effect of different dietary zinc and calcium levels on the performance of broiler chicks. *Indian Journal of Animal Nutrition* 13(3):

159-161.

- Mineral** Khanagwal Poonam(A), Mandal, A. B., and Ghosh, J. D. 2000. effect of mixed coccidiosis and dietary supplementation of calcium and zinc on some mineral retention in broilers. *Indian Journal of Animal Sciences* 70(3): 313-315.
- Alt** Khanagwal Poonam(A), Mandal, A. B(A), Ghosh, J. D., and Sagar Vidya(A). 1998. effect of supplemental levels of calcium and zinc on energy metabolizability and nitrogen retention in broilers exposed to mixed coccidiosis. *Indian Journal of Animal Nutrition* 15(4): 236-241.
- Nut def** Khandaker, Z. H. and Telfer, S. B. treatment of zinc deficiency in sheep by zinc containing boluses. *Asian-Australasian Journal of Animal Sciences*. 3 (1). 1990. 53-60.
- Alt** Khanna Peeyush, Wang Lifei, Perez-Polo Regino J, and Ansari Naseem H(A). 1997 . oxidative defense enzyme activity and mrna levels in lenses of diabetic rats. *Journal of Toxicology and Environmental Health* 51(6): 541-555.
- HHE** Khanum, S., Alam, A. N., Anwar, I., Ali, M. A., and Rahaman, M. M. 1988. effect of zinc supplementation on the dietary-intake and weight-gain of bangladeshi children recovering from protein-energy malnutrition. *European Journal Of Clinical Nutrition* 42(8): 709-714.
- FL** Kharitonova, O. V. and Volkov, D. T. forms of calcium and magnesium compounds in hen blood plasma in the egg laying period and under the effect of different trace element levels. *Byull. Vses. Nauchno-Issled. Inst. Fiziol. Biokhim. Pitan. S-kh. Zhivotn.* (1976): 10(2), 54-6
- Nut** Khattab, H. M., Abdelmawla, S. M., El-Kousy, H. A., and Salama, A. M. 1998. effects of including broiler litter and virginiamycin in friesiancalves rations on carcass characteristics and composition. *Annals of Agricultural Science (Cairo)* (Special Issue, Volume 1): 25-41.
- Drug** Khedun, S. M., Leary, W. P., Lockett, C. J., and Maharaj, B. changes in myocardial electrolytes and ventricular fibrillation threshold induced by alcohol feeding in laboratory rats. *Jpn. Heart J.* (1991) 32(3): 373-9
- Mix** Khil'kevich, N. 1976. herd reproduction - the scientific approach. *Molochnoe i Mayasnoe Skotovodstvo* (11): 31-33.
- FL** Khilo, KH. and Mandour, A. A. the effect of zinc enriched ration on lipid and lipoprotein patterns in chickens. *Vet. Med. J. Giza* (1994) 42(3): 117-20.
- Nut def** Khoja, S. M(A). 1999. effect of dietary zinc deficiency on serum lipid concentrations of the rat. *Clinical Chemistry* 45(6 PART 2): A149.
- No COC** Khokhar, A. R. PERVEZ A. Rizvi S. W. A. and Ismail S. 1999. rodent infestation and its control in a plantation forest at pasni, balochistan. *Pak.J.Zool.* 31(1): 65-69.
- Phys** Khoo, C., Hallquist, N. A., Samuelson, D. A., and Cousins, R. J. 1996. differential expression of cysteine-rich intestinal protein in liver and intestine in ccl4-induced inflammation. *American Journal of Physiology* 270(4 Pt 1): G613-8.
- Fate** Khristov, K. D. behavior of zinc-65 in the rat body. *LETAVET, A.A. AND E.B. KURLYANDSKAYA (EDITED BY). THE TOXICOLOGY OF RADIOACTIVE SUBSTANCES. VOL. 5. ZINC-65. VI + 187P. ILLUS. PERGAMON PRESS: ELMSFORD, N.Y., U.S.A.; OXFORD, ENGLAND. 1970 12-19*
- Org Met** Kidd, M., Anthony, N. B., Johnson, Z., and Lee, S. 1992. effect of zinc methionine

- supplementation on the performance of mature broiler breeders. *Applied Poultry Research* 1(2): 207-211.
- Nut** Kidd, M. T., Anthony, N. B., and Lee, S. R. 1992. progeny performance when dams and chicks are fed supplemental zinc. *Poult. Sci.* 71(7): 1201-6 .
- Nut** Kidd, M. T., Anthony, N. B., Newberry, L. A., and Lee, S. R. 1993. effect of supplemental zinc in either a corn-soybean or a milo and corn-soybean meal diet on the performance of young broiler breeders and their progeny. *Poult. Sci.* 72(8): 1492-9 .
- CP** Kidd, M. T., Anthony, N. B., Newberry, L. A., and Lee, S. R. effect of zinc added to the broiler breeder diet on progeny immune response and eimeria-tenella challenge. *THIRTEENTH ANNUAL MEETING OF THE SOUTHERN POULTRY SCIENCE SOCIETY, ATLANTA, GEORGIA, USA, JANUARY 20-21, 1992. POULT SCI.* 71 (Suppl. 1). 1992. 160.
- Abstract** Kidd, M. T., Ferket, P. R., and Qureshi, M. A. 1993. effect of zinc-methionine and manganese-methionine on the performance and immune response of young turkeys. *Poultry Science* 72(SUPPL. 1): 174.
- No Control** Kidd, M. T., Qureshi, M. A., Ferket, P. R., and Thomas, L. N. 1994. blood clearance of escherichia coli and evaluation of mononuclear-phagocytic system as influenced by supplemental dietary zinc methionine in young turkeys. *Poultry Science.* 73(9): 1381-1389.
- Nut** Kidd, M. T., Qureshi, M. A., Ferket, P. R., and Thomas, L. N. 1994. dietary zinc-methionine enhances mononuclear-phagocytic function in young turkeys: zinc-methionine, immunity and salmonella. *Biological Trace Element Research* 42(3): 217-229.
- FL** Kielan-Bak, Zofia, Tara, Barbara, and Strzelec, Malgorzata. effect of combined zinc and lead toxicity on the blood profile of rats. *Pr. Nauk. Uniw. Slask. Katowicach (1984)* 642(Zagadnienia Morfol., Fizjol. Ekol. Zool.): 132-40 .
- CP** KIENHOLZ, E. W., FLINCHUM, J. L., PFAFF, W. P., and MORENG, R. E. 1990. effect of zinc methionine on stressed laying hens . *79TH ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION*
- Nut def** Kienholz, E. W., Moreng, R. E., and Flinchum, J. D. 1992. zinc methionine for stressed laying hens. *Poultry Science* 71(5): 829-32.
- Unrel** Kienzle, E., Stratmann, B., and Meyer, H. 1991. body composition of cats as a basis for factorial calculation of energy and nutrient requirements for growth. *Journal of Nutrition* 121(11S): S122-S123.
- CP** Kies, C., Young, E., and Mcendree, L. 1983. zinc bioavailability from vegetarian diets - influence of dietary fiber, ascorbic-acid, and past dietary practices. *Acs Symposium Series* 210: 115-126.
- FL** Kietzmann, M. 1984. effects of organic and inorganic zinc compounds in the diet on liver protein synthesis and growth of rats. *Deutsche Tierärztliche Wochenschrift* 91(11/12): 391...396.
- FL** Kietzmann, M. 1984. effects of organic and inorganic zinc compounds on the rate of protein synthesis in catabolic metabolism. *Praktische Tierarzt* 65(11): 1012...1021.
- FL** Kietzmann, M. 1984 . oral substitution of zinc deficit with zinc aspartate and zinc carbonate in rats. *Dtsch. Tierärztl. Wochenschr.* 91(7-8): 273-6.

- Nut def** Kietzmann, M. 1984. oral substitution with zinc aspartate and zinc carbonate in zinc-deficient rats. *Deutsche Tierärztliche Wochenschrift* 91(7/8): 273-276.
- FL** Kietzmann, M. Tierärztliche Hochschule Hannover Germany F. R. Institut fuer Pharmakologie. 1984. effects of feeding organic or anorganic zinc-salts on rate of protein synthesis in liver and growth of rats. <original> auswirkungen der fuetterung organischer und anorganischer zinkverbindungen auf die lebereiweissynthese und das wachstum von ratten. *Deutsche Tierärztliche Wochenschrift*. V. 91(11/12) P. 391-396
- In Vit** Kikuchi, M., Kashii, S., Honda, Y., Ujihara, H., Sasa, M., Tamura, Y., and Akaike, A. 1995. protective action of zinc against glutamate neurotoxicity in cultured retinal neurons. *Investigative Ophthalmology & Visual Science* 36(10): 2048-53.
- FL** Kikuchi, M., Takeda, K., Miyazawa, C., and Shimizu, T. 1988. [timing of administration of cariogenic diet and elemental composition in the rat enamel]. *Tohoku Shika Daigaku Gakkai Shi* 15(2): 93-100.
- Nut def** Kikuchi, Takeo, Okamoto, Hiroh, Ohbori, Shoko, and Ishikawa, Kiyoko. 1983. effects of trace elements during total parenteral nutrition in rats . i. effects of parenteral solution containing iron, zinc, copper and iodine on growth , blood chemistry, histopathology and wound healing in trace element-deficient rats. *Nippon Eiyo Shokuryo Gakkaishi* 36(4): 273-81.
- Nut** Kikunaga, S. and Takahashi, M. 1988. effect of long-term ingestion of normal and low protein diets with different levels of calcium and phosphorus on bone loss of multiparous rats. *Nutrition Reports International* 38(4): 757-766.
- Nut def** Kikunaga, Shigeshi and Ishibashi, Genji. bioavailability of iron in brown sugar and palm sugar for iron-deficient rats. *Nippon Kasei Gakkaishi* (1997) 48(3): 215-223.
- CP** KILBURN, K. H. zinc and copper modify congenital defects due to a bis dichloroacetyl diamine (win 18,446). *FED PROC FED AM SOC EXP BIOL* 42:623,1983
- Abstract** Killinger, J., Melnick, R., Basaran, A., Hite, J., Ryan, M., Sawhney, A., and Kurtz, P. effect of dibutyl phthalate on the f344 rat with and without in utero exposure. *Toxicologist* 1991 Feb;11(1):341
- Chem Meth** Kiltenick, M. A., Frederickson, C. J., and Manton, W. I. acid vapor decomposition for determination of zinc in brain tissue by isotope dilution mass spectrometry. *Analytical Chemistry*. 55 (6). 1983. 921-923.
- FL** Kim, C. S. and Kang, Y. S. nutritional studies on the interrelation of copper with zinc. *Han'Guk Ch'Uksan Hakhoe Chi* (1971) 13(1): 68-71.
- FL** Kim, E. G. and Lee, H. O. 1989. effect of dietary cellulose on zinc metabolism in rats fed different level of zinc. *Han'Guk Yongyanghak Hoeji = Korean Journal of Nutrition* 22(6): 539-546.
- Nut def** Kim, Eul-Sang, Noh, Sang K., and Koo, Sung I. marginal zinc deficiency lowers the lymphatic absorption of .alpha.-tocopherol in rats. *J. Nutr.* (1998) 128(2): 265-270.
- Drug** Kim Hyoung-Chun(A), Bing Guoying, Jhoo Wang-Kee, Ko Kwang Ho, Kim Won-Ki, Suh Jeong-Hye, Kim Seong-Jin, Kato Kanefusa, and Hong Jau-Shyong. 2000. changes of hippocampal cu/zn-superoxide dismutase after kainate treatment in the rat. *Brain Research* 853(2): 215-226.
- Drug** Kim Hyoung-Chun(A), Jhoo Wang-Kee, Choi Dong-Young, Im Doo-Hyun, Shin Eun-Joo, Suh

Jeong-Hye, Floyd Robert A, and Bing Guoying. 1999. protection of methamphetamine nigrostriatal toxicity by dietary selenium. *Brain Research* 851(1-2): 76-86.

- IMM** Kim, Hyun-Sook and Sung, Chung-Ja. effects of zn intake on immune responses in high fat diet-induced obese rats. *Han'Guk Sikip'Um Yongyang Kwahak Hoechi* (1999) 28(2): 464-470
- No COC** KIM, J. N., RUNGE, W., WELLS, L. J., and LAZAROW, A. effects of experimental diabetes on the offspring of the rat: fetal growth, birth weight, gestation period and fetal mortality. *DIABETES* 9:396-404, 1960
- FL** Kim, K. I. and Yang, Y. H. artificial light-cycle control and improved feed formulation for pheasant production. iii. effect of zn and mn supplementation on growth, feathering and shank length of pheasant chicks. *Korean Journal of Animal Science - Han'Guk Ch'Uksan Hakhoechi* (1993) 35(5): 391-5.
- FL** Kim, M. H. and Sung, C. J. 1991. the effect of the levels of dietary zinc and alcohol consumption on lipid metabolism in the rats. *Korean Journal of Nutrition* 24(2): 87-96.
- FL** Kim, M. K. and Seo, M. S. Ewha Womans University Seoul Korea Republic Department of Foods & Nutrition. 1996. effect of dietary protein level and source on cadmium intoxicification in rats. *The Korean Journal of Nutrition*. V. 29(6) P. 578-589
- Abstract** Kim, S. and Gordon, D. T. the effect of viscosity on zinc-65 transfer from the small intestine of the rat using a double perfusion technique. *72ND ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, LAS VEGAS, NEVADA, USA, MAY 1-5, 1988. FASEB (FED AM SOC EXP BIOL) J.* 2 (5). 1988. Abstract 6520.
- Nut def** Kim, S., Wilson, J. J., Allen, K. G. D., and Clarke, S. D. 1996. suppression of renal gamma-glutamylcysteine synthetase expression in dietary copper deficiency. *Biochimica Et Biophysica Acta = International Journal Of Biochemistry And Biophysics*. 1313(2): 89-94.
- Nut def** Kim, S. H(A), Han, B., and Keen, C. L. 1997. influence of dietary carbohydrate on the expression of zinc deficiency in the rats. *FASEB Journal* 11(3): A193.
- Unrel** Kim Si-Yeol(A), Kwak Jung-Sik, Shin Jae-Pil, and Lee Sang-Hee. 1998. the protection of the retina from ischemic injury by the free radical scavenger ebg 761 and zinc in the cat retina. *Ophthalmologica* 212(4): 268-274.
- Nut def** Kim, Sun H. and Keen, Carl L. influence of dietary carbohydrate on zinc-deficiency-induced changes in oxidative defense mechanisms and tissue oxidative damage in rats. *Biol. Trace Elem. Res.* (1999) 70(1): 81-96
- Unrel** Kim, Y., Ratzliff, V., Choi, S. G., Lalazar, A., Theiss, G., Dang, Q., Kim, S. J., and Friedman, S. L. 1998. transcriptional activation of transforming growth factor beta1 and its receptors by the kruppel-like factor zf9/core promoter-binding protein and sp1. potential mechanisms for autocrine fibrogenesis in response to injury. *Journal of Biological Chemistry* 273(50): 33750-8.
- Org Met** Kim, Y. C(A), Davies, M. G., Marson, L., Hagen P-O, and Carson, C. C. Iii. 1994. lack of effect of carbon monoxide inhibitor on relaxation induced by electrical field stimulation in corpus cavernosum. *Urological Research* 22(5): 291-293.
- CP** Kimmel, P. L. and Langman, C. B. zinc depletion limits the vitamin d-3 response to low phosphate diet lpd. *MEETING OF THE AMERICAN SOCIETY OF NEPHROLOGY, WASHINGTON, D.C., USA, DECEMBER 13-16, 1987. KIDNEY INT.* 33 (1). 1988. 342.

- Nut** Kimmel, P. L., Watkins, D. W., Gubish, C. T., Slatopolsky, E., and Langman, C. B. zinc nutritional status modulates the 1,25 dihydroxyvitamin d response in uremic rats. *MINER ELECTROLYTE METAB. Mineral and Electrolyte Metabolism.* 17 (5). 1991 (1992). 307-314.
- Nut def** Kimmel, P. L., Watkins, D. W., Teller, E. B., Khanna, R., Dosa, S., and Phillips, T. M. 1988. zinc balance in combined zinc deficiency and uremia. *Kidney International* 33(6): 1091-9.
- Nut** Kimmel, Paul L., Gubish, Christopher T., Watkins, Don W., and Langman, Craig B. zinc nutritional status modulates the response of 1,25- dihydroxycholecalciferol to calcium depletion in rats. *J. Nutr.* (1992) 122(7): 1576-81.
- Nut def** Kimmel, Paul L., Watkins, Don W., Slatopolsky, Eduardo, and Langman, Craig B. 1990. 1,25- dihydroxyvitamin d response to combined zinc and phosphorus depletion in rats. *Am. J. Physiol.* 259(3, Pt. 1): E319-E326.
- Nut def** Kimmel, Paul L., Watkins, Don W., Teller, Elizabeth B., Khanna, Rajiv, Dosa, Stefan, and Phillips, Terence M. zinc balance in combined zinc deficiency and uremia. *Kidney Int.* (1988) 33(6): 1091-9
- Drug** Kimoto, I. significance of various metals in experimental gastric ulcers of rabbits. *Nihon University Journal of Medicine.* 33 (1). 1991. 63-74.
- Nut def** Kimoto, I., Mano, M., Susa, N., Tamaki, T., Takeuchi, S., Ishikawa, H., Arakawa, Y., Saito, S., and Sasaki, T. metal metabolism in ods rats . (ii)---relationship between osteogenesis and zn---. *Biomed. Res. Trace Elem.* (1993) 4(2): 135-6.
- Gene** Kimpo, R. R. and Doupe, A. J. 1997. fos is induced by singing in distinct neuronal populations in a motor network. *Neuron* 18(2): 315-25.
- Org Met** Kimura, Takahashi, M., Inokuchi, K. , Kasakawa, H., and Wakai. experimental studies on the effects on rabbits of pesticide (zinc ethylenebis-dithiocarbamate and n-trichloromethyl-tetrahydrophthalimide) spraying in vinyl greenhouses.). *Nippon Noson Igakkai Zasshi (J. Jpn. Assoc. Rural Med.)*23(4): 522-528; 1974
- Unrel** Kimura, J. T. 1982. a comparative analysis of zinc and non-zinc alloys used in retrograde endodontic surgery. part 1: apical seal and tissue reaction. *Journal of Endodontics* 8(8): 359-63.
- No COC** Kimura, M., Matumura, K., Hatsuda, N., Takeda, T., Noumi, S., and Yokoyama, Y. growth check and magnesium imbalance on young rats by over intakes of calcium . *Magnesium: Curr. Status New Dev.* [Int. Symp. Magnesium], 8th (1997): 151-168. Editor(s): Theophanides, Theophile; Anastassopoulou, Jane. Publisher: Kluwer, Dordrecht, Neth.
- Abstract** KIMURA, M., ORIKASA, S., and SAJIKI, J. 1927. calcium factor associated with injury of rat testis induced by cadmium. *3RD INTERNATIONAL CONGRESS OF ANDROLOGY*
- No COC** Kimura, Mieko, Matsumura, Kenji, Itokawa, Yoshinori, Noumi, Shigeru, and Yokoyama, Yoshindo. effects of oral magnesium supplement on minerals status in rats. *Biomed. Res. Trace Elem.* (1996) 7(3): 231-232 .
- FL** Kimura, Y., Furukawa, M., Kamide, M., Sakumoto, M., Miwa, T., and Umeda, R. 1989. [experimental study on the effect of the topical application of steroids on olfactory disturbance in mice]. *Nippon Jibiinkoka Gakkai Kaiho* 92(11): 1869-75.
- No Oral** Kimura, Y., Kamide, M., Miyazaki, T., and Umeda, R. 1987. olfactory behavior of mice in

response to cycloheximide an agricultural fungicide and rodent repellent. *Practica Otologica Kyoto*. 80(30): 469-475.

- No Oral** Kimura, Y., Miwa, T., Furukawa, M., and Umeda, R. effects of topical application of steroids on olfactory disturbance in mice. *CHEM SENSES. Chemical Senses*. 16 (4). 1991. 297-302.
- No COC** Kinal, S., Luczak, W., and Pres, J. 1994. chemical evaluation of various dolomites and limestone and their effect on utilization of Ca, P, Mg, Zn, Cu and organic components in feeding growing sheep. *Roczniki Naukowe Zootechniki* 21(1/2): 181-194.
- FL** Kinal, S., Luczak, W., Pres, J., and Fritz, Z. Akademia Rolnicza Wroclaw Poland. 1986. using of various mineral additives in maize ensilage diets for heifers. <original> zastosowanie roznych dodatkow mineralnych do kiszzonej kukurydzy w zywieniu jalowek. *Roczniki Naukowe Zootechniki. Monografie i Rozprawy*. (No. 24) P. 103-115
- FL** Kinal, S., Paleczek, B., Korniewicz, A., and Pres, J. 1997. estimation of different zinc levels in diets for ewes with regard to calcium and phosphorus requirements as specified by Polish, intra and ILL standards. *Roczniki Naukowe Zootechniki* 24(4): 187-202.
- Mineral** Kinal, S. and Pres, J. 1995. the effect of dolomite, limestone and zinc oxide as feed additives on utilization of organic matter and minerals by young fattening cattle. *Journal of Animal and Feed Sciences* 4(3): 183-194.
- Mineral** Kinal, S. and Pres, J. 1996. utilization of organic and mineral components by young fattening cattle fed diets containing magnesium oxide and magnesium sulphate. *Roczniki Naukowe Zootechniki* 23(4): 157-167.
- Nut** Kinal, S., Pres, J., <Editors> Gediga, K., and Ciesla, G. 1996. absorption of zinc and copper in dry cows. *Zeszyty Problemowe Postepow Nauk Rolniczych* 434(II): 723-727.
- Mineral** Kinal, S., Pres, J., Korniewicz, A., Chraszcz, E., and Kistowski, T. 1996. the effect of different Mg and Zn level on nutrients and mineral compounds absorption in dairy cows. *Roczniki Naukowe Zootechniki* 23(4): 127-145.
- Mineral** Kinal Stefania(A), Paleczek Barbara, Korniewicz Adolf, and Pres Jerzy. 1996. comparison of requirement for mineral substances in ewes in dry period. *Archivum Veterinarium Polonicum* 36(1-4): 89-99.
- Mineral** Kinal Stefania(A), Pres Jerzy, Korniewicz Adolf, Chraszcz Ewa, and Kistowski Tadeusz. 1996. effect of different Mg and Zn levels on assimilation of organic components and minerals in dry cows. *Archivum Veterinarium Polonicum* 36(1-4): 101-113.
- Drug** Kinalski M(A), Sledziwski, A., Telejko, B., Zarzycki, W., and Kinalska, I. 1999. antioxidant therapy and streptozotocin-induced diabetes in pregnant rats. *Acta Diabetologica*. 36(3): 113-117.
- Diss** Kincaid N.G. 1986. ultrastructural and functional effects of lead poisoning on adult canine myocardium: assessment of thiamin treatment. *DISS. ABST. INT. PT. B - SCI. & ENG* VOL. 46, NO. 11: 135 pp^.
- Mix** Kincaid, R. L. biological availability of zinc from inorganic sources with excess dietary calcium. *J. Dairy Sci.* (1979) 62(7): 1081-5 .
- Bio Acc** Kincaid, R. L. factors associated with the variation of copper and zinc in plasma of lactating cows. *Nutrition Reports International*. 23 (3). 1981. 493-498.

- No COC** Kincaid, R. L. and Cronrath, J. D. 1993. effects of added dietary fat and amino acids on performance of lactating cows. *Journal of Dairy Science* 76(6): 1601-1606.
- Nut def** Kincaid, R. L. and Cronrath, J. D. effects of dietary zinc upon tissue zinc and percent unsaturated plasma zinc binding capacity. *Journal of Dairy Science*. 62 (4). 1979. 572-576.
- Abstract** Kincaid, R. L. and Forar, F. L. variation in copper and zinc in plasma of cows and calves. 72ND ANNUAL MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE, ITHACA, N.Y., USA, JULY 27-30, 1980. *J ANIM SCI*. 51 (Suppl. 1). 1980 (Recd. 1981). 292.
- Bio Acc** Kincaid, R. L., Miller, W. J., Gentry, R. P., Neathery, M. W., and D. L. 1976. intracellular distribution of zinc and zinc-65 in calves receiving but nontoxic amounts of zinc. *Journal of Dairy Science* 59(3): 552-555.
- BioX** Kincaid, R. L., Miller, W. J., Gentry, R. P., Neathery, M. W., D. L., and Lassiter, J. W. the effect of endotoxin upon zinc retention and intracellular liverdistribution in rats. *Nutrition Reports International*| PY- 1976| VO- 13| IS- 1| PG- P.65-70
- Abstract** Kincaid, R. L., Miller, W. J., Hampton, D. L., Fowler, P. R., and Gentry, R. P. metabolic adaptations to high dietary zinc in calves and mature cows. *J DAIRY SCI. Journal of Dairy Science*. 59 (1). 1976 18
- Abstract** Kincaid, R. L., Miller, W. J., Jensen, L. S., Hampton, D. L., Gentry, R. P., and Flatt, W. P. the ability of zinc homeostatic control mechanisms in young chicks to adjust to high dietary zinc intakes. *FED PROC. Federation Proceedings*. 35 (3). 1976 659
- Drug** King, A. B. and Schwartz, R. 1987. effects of the antituberculous drug ethambutol on zinc absorption, turnover and distribution in rats fed diet marginal and adequate in zinc. *Journal of Nutrition* 117(4): 704-8.
- Drug** King, Alison B. and Schwartz, Ruth. effects of the antituberculous drug ethambutol on zinc absorption, turnover and distribution in rats fed diets marginal and adequate in zinc. *J. Nutr.* (1987) 117(4): 704-8.
- FL** KING, D. W. and CHEN, D. C. teratogenic effects of nickel acetate on chick embryogenesis. *SHENG SU K'O HSUEH(BIOL SCI)* 23:44-51,1984
- Unrel** King, J. O. 1980. effects of feeding zinc bacitracin on the fertility of rabbit does and the development of young rabbits. *British Veterinary Journal* 136(3): 240-4.
- Drug** King, J. O. 1976. the feeding of zinc bacitracin to growing rabbits. *Veterinary Record* 99(25-26): 507-8.
- Unrel** King, J. O. L. 1980. effects of feeding zinc bacitracin (antibiotic feed additive) on the fertility of rabbit does and the development of young rabbits. *The British Veterinary Journal*. 136 (3): 240-244.
- No COC** King, J. O. L. 1978. feeding dried rabbit faeces to growing rabbits. *British Veterinary Journal* 134(4): 393-397.
- Unrel** King, Janet C. does poor zinc nutriture retard skeletal growth and mineralization in adolescents? *Am. J. Clin. Nutr.* (1996) 64(3): 375-376.
- Nut def** King, L. E. and Fraker, P. J. 1991. flow cytometric analysis of the phenotypic distribution of splenic lymphocytes in zinc-deficient adult mice. *The Journal Of Nutrition*. 121(9): 1433-

1438.

- IMM** King, L. E., Osati-Ashtiani, F., and Fraker, P. J. 1995. depletion of cells of the b lineage in the bone marrow of zinc-deficient mice. *Immunology* 85(1): 69-73.
- Mix** King, L. J., Bigelow, J. E., and Collins, E. D. 1978. *Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1977*
- Acu** King, Laura M., Anderson, Mary B., Sikka, Suresh C., and George, William J. 1998. murine strain differences and the effects of zinc on cadmium concentrations in tissues after acute cadmium exposure. *Arch. Toxicol.* 72(10): 650-655 .
- Mix** Kinnamon, K. E. 1965. *Copper, Molybdenum and Zinc Interrelationships: The Influence of Inorganic Sulfate Upon Distribution and Excretion of 65zn and 99mo in Pregnant Rats* : 2p.
- Drug** Kinnamon, K. E. 1966. radiation and wound healing: influence of dietary methionine and zinc on zinc-65 distribution and excretion in the rat. *Radiation Research* 29(2): 184-93 .
- Mix** Kinnamon, K. E. 1966. *The Role of Iron in the Copper-Zinc Interrelationship in the Rat* : 8p.
- In Vit** Kinoshita, C. M. and Ganther, H. E. isolation of a novel rat testicular metalloprotein binding cadmium and zinc. *Biological Trace Element Research.* Sept/Dec 1988. v. 17 p. 189-206.
- Alt** Kinoshita Masato(A), Toyohara Haruhiko(A), Sakaguchi Morihiko(A), Kioka Noriyuki, Komano Tohru, Inoue Koji, Yamashita Shinya, Satake Mikio, Wakamatsu Yuko, and Ozato Kenjiro. 1994. zinc-induced activation of rainbow trout metallothionein-a promoter in transgenic medaka. *Fisheries Science (Tokyo)* 60(3): 307-309.
- Abstract** KINZIE, J. M. and LLEWELLYN, G. C. 1981. some aspects of dietary zinc levels and aflatoxicosis in fischer rats . *59TH ANNUAL MEETING OF THE VIRGINIA ACADEMY OF SCIENCE*
- Unrel** Kioussi, C., Crine, P., and Matsas, R. 1992. endopeptidase-24.11 is suppressed in myelin-forming but not in non-myelin-forming schwann cells during development of the rat sciatic nerve. *Neuroscience* 50(1): 69-83.
- BioX** Kioussi Chrissa, Mamalaki Avgi, Jessen Kristjan, Mirsky Rhona, Hersh Louis B, and Matsas Rebecca(A). 1995. expression of endopeptidase-24.11 (common acute lymphoblastic leukaemia antigen cd10) in the sciatic nerve of the adult rat after lesion and during regeneration. *European Journal of Neuroscience* 7(5): 951-961.
- Abstract** Kirby, J. D. and Froman, D. p. 1988. effect of dietary supplementation of zinc on the spermatozoal integrity of low-fertility delaware roosters. *Poultry Science* 67(Supplement 1): 103.
- FL** Kirchgessner, M., Gokel, E. M., and Roth, H. P. concentrations of blood glucose and serum insulin of chromium-deficient rats after oral glucose tolerance test. *J. Anim. Physiol. Anim. Nutr. (1987)* 57(3): 139-46.
- FL** Kirchgessner, M. and Hartel, J. 138. intermediary availability of zinc from 15 different zinc compounds. *Zeitschrift Fur Tierphysiologie Tierernahrung Und Futtermittelkunde*
- FL** Kirchgessner, M. and Hartel, J. metabolic zinc efficiency of 15 various zinc compounds. *Z TIERPHYSIOL TIERERNAEHR FUTTERMITTELKD. Zeitschrift Fuer Tierphysiologie Tierernaehrung Und Futtermittelkunde.* 38 (3). 1977 138-146.

- Nut def** Kirchgessner, M., Moser, C., and Roth, H. P. 1996. activity and subcellar distribution of protein kinase c (pkc) in muscle and brain of force-fed zinc-deficient rats. *Biological Trace Element Research*. 52(3): 273-280.
- Nut** Kirchgessner, M., Motz, C., and Roth, H. P. 1995. influence of dietary amiloride supplement on the zinc status of growing rats with marginal zinc supply. *Research in Experimental Medicine* 195(4): 237-42.
- FL** Kirchgessner, M. and Pallauf, J. 1972. metabolism of zinc in the animal organism. 3. zinc depletion of weaned rats. *Z. Tierphysiol. Tierernaehr. Futtermittelk.* 29(2): 65-76.
- FL** Kirchgessner, M. and Pallauf, J. 1972. metabolism of zinc in the animal organism. zinc repletion in the serum and liver of weaned rats. *Z. Tierphysiol. Tierernaehr. Futtermittelk.* 29(2): 77-85
- FL** Kirchgessner, M. and Pallauf, J. zinc depletion in serum and liver of rats part 4 on zinc metabolism in the animal organism. *Zeitschrift Fuer Tierphysiologie Tierernaehrung Und Futtermittelkunde.* 29 (2). 1972 77-85.
- CP** Kirchgessner, M. and Paulicks, B. R. 1994. self-selection of various nutrients. <. *Document Title>Proceedings 9th European Poultry Conference, Glasgow,UK, 7-12 August 1994: Volume 2.* 215-218.
- FL** Kirchgessner, M., Paulicks, B. R., and Hagemeister, H. 1994. zinc concentration in the milk of dairy cows supplemented with high levels of zinc methionine. *Journal of Animal Physiology and Animal Nutrition* 72(2-3): 165-167.
- FL** Kirchgessner, M. and Paulicks, Brigitte R. estimation of the requirement of protein, amino acids and micronutrients of poultry using diet self-selection. *Arch. Gefluegelkd. (1995)* 59(6): 305-10.
- FL** Kirchgessner, M., Plank, J., and Roth H-P. effect of alimentary zinc deficiency on vitamin a and alpha tocopherol metabolism in rats. *Zeitschrift Fuer Ernaehrungswissenschaft.* 26 (1). 1987. 1-6.
- FL** Kirchgessner, M., Plank, J., and Roth, H. P. 1987. effect of dietary deficiency of zinc on metabolism of vitamin a and alpha -tocopherol in rats. *Zeitschrift Fur Ernahrungswissenschaft* 26(1): 1-6.
- FL** Kirchgessner, M., Plank, J., and Roth, H. P. effect of dietary zinc deficiency on vitamin a and .alpha.-tocopherol metabolism in rats. *Z. Ernaehrungswiss. (1987)* 26: 1-6.
- FL** Kirchgessner, M. and Roth, F. X. olaquinox, a new growth promoter in animal nutrition. 3.in veal fattening. *Zeitschrift Fur Tierphysiologie Tiernahrung Und Futtermittelkunde* PY- Was Given at From 5 to 50 Mg/Kg Milk Replacer. Up to 10 Mg Had Little Effect. With 25 Mg or More Gain Was Increased by 8% and Efficiency by 6%. Olaquinox Was Better Than Zinc Bacitracin at 80 Mg/Kg. Carcasses Were Not Affected. Olaquinox Was Equally Effective at All Ages. (From Summary).
- FL** Kirchgessner, M. and Roth, F. X. olaquinox a new growth promotor in animal nutrition part 3 its effectiveness in fattening calves. *Zeitschrift Fuer Tierphysiologie Tierernaehrung Und Futtermittelkunde.* 38 (1). 1977 23-28.
- Nut def** Kirchgessner, M., Roth, F. X., and Roth, H. P. 1987. effects of a grain-rich diet without added trace elements and vitamin on various performance values in fattening pigs. *Journal of*

Veterinary Medicine, A (Animal Physiology, Pathology and Clinical Veterinary Medicine) 34(3): 188-203.

- Nut def** Kirchgessner, M., Roth, F. X., and Roth H-P. effects of a grain-rich diet without addition of trace elements and vitamins on several performance parameters of fattening pigs. *J VET MED SER A. Journal of Veterinary Medicine Series A.* 34 (3). 1987. 188-203.
- Nut def** Kirchgessner, M. and Roth H.-P. 1980. biochemical changes of hormones and metalloenzymes in zinc deficiency. *IN "ZINC IN THE ENVIRON., PT. 2: HEALTH EFFECTS :* pp. 71-103.
- CP** Kirchgessner, M. and Roth, H. P. 1985. dependency of serum growth hormone (gh) levels on zinc supply in rats. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th :* Meeting Date 1984, 62-5. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK.
- FL** Kirchgessner, M. and Roth, H. P. 1975. [determination of metabolic availability of zinc and estimation of zinc requirements through changes in the activity of metallo-zinc enzymes]. <original> bestimmung der verfuhrbarkeit von zink im stoffwechsel sowie ermittlung des zinkbedarfs mittels aktivitatsanderung von zink-metalloenzymen. *Archiv Fur Tierernahrung* 25(1): 83-92.
- FL** Kirchgessner, M. and Roth, H. P. determination of the metabolic availability of zinc and estimation of the zinc requirements of animals by measuring changes in the activity of metallo-zinc enzymes. *Arch. Tierernaehr. (1975)* 25(1): 83-92.
- FL** Kirchgessner, M. and Roth, H. P. 1975. estimation of the metabolic availability of zinc and assessment of the zinc requirement from changes in activity of zinc-metalloenzymes. *Archiv Fur Tierernahrung* 25(1): 83-92.
- Nut def** Kirchgessner, M. and Roth, H. P. 1985. influence of zinc depletion and zinc status on serum growth hormone levels in rats. *Biological Trace Element Research* 7(4): 263-268.
- Nut** Kirchgessner, M. and Roth, H. P. 1983. nutritional influence of zinc on the activity of enzymes and hormones. *Metal Ions In Biological Systems* 15: 363-414.
- FL** Kirchgessner, M. and Roth, H. P. 1974. relation between clinical deficiency signs and enzyme activities in zinc deficiency. *Zentralbl. Veterinaarmed. Reihe A* 22(1): 14-26
- FL** Kirchgessner, M. and Roth, H. P. 1975. relations between clinical signs of deficiency and enzyme activity in zinc deficiency. *Zentralblatt Fur Veterinarmedizin, A* 22(1): 14-26.
- FL** Kirchgessner, M. and Roth H-P. relationship between clinical deficiency signs and enzyme activities in zinc deficiency. *Zentralblatt Fur Veterinarmedizin Reihe A.* 22 (1). 1975 14-26.
- FL** Kirchgessner, M., Roth H-P, and Schwarz, W. A. effect of zinc deficiency on serum insulin level of dairy cows part 17. *Z TIERPHYSIOL TIERERNAEHR FUTTERMITTELKD. Zeitschrift Fur Tierphysiologie Tierernaehrung Und Futtermittelkunde.* 36 (4). 1976 175-179.
- FL** Kirchgessner, M., Roth, H-P., and Schwarz, W. A. 1975. effect of zinc deficiency on the serum insulin level in dairy cows. zinc metabolism in the animal body. *Zeitschrift Fur Tierphysiologie, Tierernaehrung Und Futtermittelkunde*
- FL** Kirchgessner, M., Roth-Maier, D. A., Reithmayer, F., and Spoerl, R. the influence of suboptimal maternal zinc supply during pregnancy on the zinc status of newborn piglets. *Z TIERPHYSIOL TIERERNAEHR FUTTERMITTELKD. Zeitschrift Fur Tierphysiologie Tierernaehrung Und*

Futtermittelkunde. 54 (1). 1985. 20-27.

- FL** Kirchgessner, M., Schams, D., and Roth, H.-P. 151. zinc metabolism in the animal body. 18. influence of zinc deficiency on lactating cows on the fsh and lh content of the serum. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde*
- FL** Kirchgessner, M. and Schneider, U. A. 1978. anabolism of zinc in pregnancy. *Archiv Fur Tierernahrung* 28(4): 211-220.
- FL** Kirchgessner, M. and Schneider, Ursula A. zinc anabolism during pregnancy. *Arch. Tierernaehr.* (1978) 28(4): 211-20
- FL** Kirchgessner, M., Schuelein, A., Roth, H. P., and Schliack, M. influence of alimentary zinc depletion on lipoprotein fractions and free fatty acids in the blood serum of force-fed rats. *J. Anim. Physiol. Anim. Nutr.* (1992) 67(4): 188-97.
- No Oral** Kirchgessner, M., Schulein, A., Roth, H. P., Schliack, M., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. influence of alimentary zinc depletion on the concentration of cholesterol, phospholipids and triglycerides in serum and lipoprotein fractions of force-fed rats. 176-177.
- FL** Kirchgessner, M. and Schwarz, W. A. 1975. relation of clinical signs of zinc deficiency to zinc status in lactating cows. *Zentralblatt Fur Veterinarmedizin, A.* 22(7): 572-582.
- FL** Kirchgessner, M., Schwarz, W. A., and Roth H-P. alkaline phosphatase activity in the serum and bones of zinc depleted and zinc repleted cows metabolism of zinc in animals. *Z TIERPHYSIOL TIERERNAEHR FUTTERMITTELKD. Zeitschrift Fuer Tierphysiologie Tierernaehrung Und Futtermittelkunde.* 35 (4). 1975 191-200.
- FL** Kirchgessner, M. and Schwarz, W. A. CS Inst. Tierernahrung der Freising-Weihenstephan German Federal Republic. 1976. effect of zinc deficiency and different zinc supplements on absorption and retention of zinc by dairy cows. *Archiv Fur Tierernahrung* 26(1): 3-16.
- FL** Kirchgessner, M. and Spoerl, R. 1977. nutritive and physiological effects of zinc bacitracin in feeds for broilers. *Archiv Fur Gefluigelkunde* 41(5): 191-195.
- Nut def** Kirchgessner, M., Stadler, Anna E., and Roth, H. P. carbonic anhydrase activity and erythrocyte count in the blood of zinc-deficient rats. *Bioinorg. Chem.* (1975) 5(1): 33-8
- FL** Kirchgessner, M., Steinruck, U., and Roth, F. X. selective zinc intake of broilers in zinc deficiency. *J. Anim. Physiol. Anim. Nutr.* (1990) 64(5): 250-60
- CP** Kirchgessner, M., Steinruck, U., and Roth, F. X. selective zinc intake of poultry. *Trace Elem. Man Anim. 7: Monogr. Proc., Round Tables Discuss. Int. Symp., 7th* (1991): Meeting Date 1990, 32-3-32/6. Editor(s): Momcilovic, Berislav. Publisher: Inst. Med. Res. Occup. Health Univ. Zagreb, Zagreb, Yugoslavia..
- Rev** Kirchgessner, M. and Weigand, E. 1983. zinc-absorption and excretion in relation to nutrition. *Metal Ions In Biological Systems* 15: 319-361.
- FL** Kirchgessner, M. Technische Univ. Muenchen Freising Germany Inst. fuer Ernahrungsphysiologie and Heindl, U. 1993. investigations about the determination of the zinc requirement of calves. <original> untersuchungen zur ableitung des zinkbedarfs von aufzuchtkaelbern. *Journal of Animal Physiology and Animal Nutrition.* V. 70(1) P. 38-52
- Nut def** Kirchgessner, Manfred and Roth, Hans Peter. influence of zinc depletion and zinc status on serum

growth hormone levels in rats. *Biol. Trace Elem. Res.* (1985) 7(4): 263-8 .

- No COC** Kirchheim, U., Berge, G., Schone, F., <Editors> Flachowsky, G., and Schubert, R. 1993. evaluation of zinc bacitracin and salinomycin in pig fattening trials. 323-326.
- Nut** Kirk, D. J., Greene, L. W., Schelling, G. T., and Byers, F. M. 1985. effects of monensin on mg, ca, p and zn metabolism and tissue concentrations in lambs. *Journal of Animal Science* 60(6): 1485-1490.
- Unrel** Kirk, E. E. and Meyer, M. J. 1992. morphology of the mineralizing front and observations of reparative dentine following induction and inhibition of dentinogenesis in the rat incisor. *Endodontics & Dental Traumatology* 8(5): 195-201.
- Nut def** Kirkova, M., Kasabova, T., and Rusanov, E. in vivo effects of indomethacin. ii. antioxidant enzymes in metal-deficient rats. *Gen. Pharmacol.* (1992) 23(2): 151-4
- Rev** Kirkpatrick, C. E. 1986. feline giardiasis: a review. *Journal of Small Animal Practice* 27(2): 69-80.
- In Vit** Kirkpatrick, C. J., Mohr, W., and Haferkamp, O. influence of zinc and copper on lapine articular chondrocytes in monolayer culture--morphology, proliferation and proteoglycan synthesis (rabbits). *Experimental Cell Biology*. Mar/Apr 1982. v. 50 (2) p. 108-114. ill.
- Nut def** Kiron, Viswanath, Gunji, Akihiro, Okamoto, Nobuaki, Satoh, Shuichi, Ikeda, Yayoi, and Watanabe, Takeshi. dietary nutrient dependent variations on natural-killer activity of the leukocytes of rainbow trout. *Gyobyo Kenkyu* (1993) 28(2): 71-6
- Nut** Kirori, S. and Kwatra, B. L. effect of dietary phytate and zinc on vitamin a metabolism in rats. *Journal of Research Punjab Agricultural University*. 24 (4). 1987. 721-726.
- In Vit** Kirsch, T., Nah, H. D., Demuth, D. R., Harrison, G., Golub, E. E., Adams, S. L., and Pacifici, M. 1997. annexin v-mediated calcium flux across membranes is dependent on the lipid composition: implications for cartilage mineralization. *Biochemistry* 36(11): 3359-67.
- In Vit** Kirsch Thorsten(A), Harrison Gerald, Worch Kai P, and Golub Ellis E. 2000. regulatory roles of zinc in matrix vesicle-mediated mineralization of growth plate cartilage. *Journal of Bone and Mineral Research*. 15(2): 261-270.
- Fate** Kishi, R., Ikeda, T., Miyake, H., Uchino, E., Tsuzuki, T., and Inoue, K. 1982. regional distribution of lead, zinc, iron and copper in suckling and adult rat brains. *Brain Research* 251(1): 180-2.
- No Dose** Kishi, Reiko, Ikeda, Toshiko, Miyake, Hirotsugu, Uchino, Eiji, Tsuzuki, Toshihumi, and Inoue, Katsuhiro. regional distribution of lead, zinc, iron and copper in suckling and adult rat brains. *Brain Res.* (1982) 251(1): 180-2 .
- Nut def** Kishore, V., Latman, N., Roberts, D. W., Barnett, J. B., and Sorenson, J. R. 1984. effect of nutritional copper deficiency on adjuvant arthritis and immunocompetence in the rat. *Agents and Actions* 14(2): 274-82.
- Nut def** Kishore, V., Latman, N., Roberts, D. W., Barnett, J. B., and Sorenson, J. R. J. effect of nutritional copper deficiency on adjuvant arthritis and immunocompetence in the rat. *Agents Actions* (1984) 14(2): 274-82
- No COC** Kiss, Z. 1994. the zinc chelator 1,10-phenanthroline enhances the stimulatory effects of protein

kinase c activators and staurosporine, but not sphingosine and h₂o₂, on phospholipase d activity in nih 3t3 fibroblasts. *Biochemical Journal* 298(Pt 1): 93-8.

- Org Met** Kita, Kazumi, Hohmura, Isao, and Okumura, Junichi. influence of dietary zinc methionine supplementation on eggshell quality in laying hens under hot climate environment. *Nippon Kakin Gakkaishi* (1997) 34(1): 21-26.
- No COC** KITAGAWA, H., SAITO, H., UENO, K., NAMINOHIRA, S., IGARASHI, T., SATOH, T., and SAKAI, T. acetylsalicylic acid induced fetaltotoxicity and drug metabolism. *J PHARMACOBIO-DYN* 5(3):S-39,1982
- No COC** Kitai, K. and Arkakawa, A. effect of antibiotics and caprylohydroxamic-acid on ammonia gas from chicken excreta. *BR POULT SCI. British Poultry Science.* 20 (1). 1979. 55-60.
- FL** Kiyozumi Morio(A), Sakaguchi Yoko(A), Shiozuka Emiko(A), Matsuda Yoshiko(A), Yamamoto Etsuko, and Kojima Shoji. 1993. a rapid determination of metallothionein in animal tissues by cd-chelex method. *Japanese Journal of Toxicology and Environmental Health* 39(4): 345-349.
- Rev** Klaassen, C. D., Liu, J., and Choudhuri, S. 1999. metallothionein: an intracellular protein to protect against cadmium toxicity. *Annual Review of Pharmacology and Toxicology* 39: 267-94.
- Unrel** Klaassen, Curtis D. and Lehman-McKeeman, Lois D. regulation of the isoforms of metallothionein. *Biol. Trace Elem. Res.* (1989) : Volume Date 1988, 21, 119-29.
- Drug** Klaassen, Curtis D. and Liu, Jie. metallothionein transgenic and knock-out mouse models in the study of cadmium toxicity. *J. Toxicol. Sci.* (1998) 23(Suppl. 2): 97-102.
- IMM** Klasing, K. C., Laurin, D. E., Peng, R. K., and Fry, D. M. 1987. immunologically mediated growth depression in chicks: influence of feed intake, corticosterone and interleukin-1. *Journal of Nutrition* 117(9): 1629-37.
- CP** Klasing, K. C., Maynard, P. M., and Laurin, D. E. hypersensitivity to dietary soy protein. *77TH ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC. POULT SCI.* 67 (Suppl. 1). 1988. 104.
- CP** KLASING, K. C., RICHARDS, M. P., DARCEY, S. E., and LAURIN, D. E. presence of acute phase changes in zinc iron and copper metabolism in turkey embryos. *PROC SOC EXP BIOL MED*; 184 (1). 1987. 7-13.
- IMM** Klasing, Kirk C. and Barnes, David M. decreased amino acid requirements of growing chicks due to immunologic stress. *J. Nutr.* (1988) 118(9): 1158-64.
- Diss** Klauder, David S. IV. 1975. the effects of dietary copper, iron, and zinc on the toxicity of lead in male rats. Avail.: Xerox Univ. Microfilms. Ann Arbor, Mich., Order No. 76-2555 From: Diss. Abstr. Int. B 1976, 36. 8. 3876. 251 pp.
- Mix** Kleczkowski, M. 1989. effect of molybdenum on copper contents in cattle at various levels of dietary zinc and sulphur. 354-361.
- FL** Kleczkowski, M. 1989. effect of molybdenum, zinc and sulphur on liveweight gain of bulls on diets with different copper content. *Medycyna Weterynaryjna* 45(5): 270-274.
- CP** Kleczkowski, M., Barej, W., Klucinski, W., Sikora, J., Dembele, K., and <Editors> Trenti, F. 1994. effect of different concentrations of copper, molybdenum, zinc and sulphur diet, on content

of selenium in the liver of bulls. <document title>proceedings 18th world buiatrics congress: 26th congress of the italian association of buiatrics, bologna, italy, august 29-september 2, 1994. volume 1. 653-655.

- FL** Kleczkowski, M. Agricultural Univ. Warsaw Poland Dept. of Internal Medicine. Fac. of Veterinary Medicine, Klucinski, W., Sikora, J., Dembele, K., Stralinski, M., Rodak, H., Dziekan, P., Anke, M., Meissner, D., Bergmann, H., Bitsch, R., Dorn, W., Flachowsky, G., Groppel, B., Guertler, H., Lombeck, I., Luckas, B., Merbach, W., and Schneider, H. J. 1994. effect of molybdenum, zinc and sulphur on xanthine oxidase activity in bulls at various levels of dietary copper. (deficits and surpluses on macro and trace elements in the nutrition). <original> defizite und ueberschuesse an mengen- und spurenelementen in der ernaehrung. P. 241-250
- FL** Kleiner, U. and Trenner, P. 1988. technical problems in the bacteriological laboratory evaluation of surface disinfectants for veterinary use. *Zentralblatt Fur Bakteriologie, Mikrobiologie Und Hygiene, B* 186(2): 138-152.
- Meth** Kleszczewska, E., Puzanowska-Tarasiewicz, H., Moniuszko-Jakoniuk, J., and Wurm-Muszynska, R. 1997. influence of cadmium and zinc on l-ascorbic acid concentration in rats, determined with fia method. *Polish Journal of Environmental Studies* 6(1): 33-36.
- Abstract** Klevay, L. M. aspirin is cholesterotropic and cuprotropic. 69TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ANAHEIM, CALIF., USA, APR. 21-26, 1985. *FED PROC.* 44 (5). 1985. 1498.
- Mix** Klevay, L. M. 1987. citation classic - hypercholesterolemia in rats produced by an increase in the ratio of zinc to copper ingested. *Current Contents/Clinical Medicine* (28): 20.
- Nut def** Klevay, L. M. 1983. clofibrate hypocholesterolemia associated with increased hepatic copper. *Drug-Nutrient Interactions* 2(2): 131-7.
- Mix** Klevay, L. M. 1973. hypercholesterolemia in rats produced by an increase in the ratio of zinc to copper ingested. *American Journal Of Clinical Nutrition.* 26(10): 1060-1068.
- Nut def** Klevay, L. M. 1987. hypertension in rats due to copper deficiency. *Nutrition Reports International* 35(5): 999-1005.
- Nut def** Klevay, L. M. 1980. hyperuricemia in rats due to copper deficiency. *Nutrition Reports International* 22(4): 617-621.
- CP** Klevay, L. M. interactions among dietary copper zinc and the metabolism of cholesterol and phospho lipids. HOEKSTRA, W. G. ET AL. (ED.). TRACE ELEMENT METABOLISM IN ANIMALS, NO. 2. PROCEEDINGS OF THE SECOND INTERNATIONAL SYMPOSIUM. MADISON, WIS., U.S.A., JUNE 18-22, 1973. XXVI+775P. ILLUS. UNIVERSITY PARK PRESS: BALTIMORE, MD., U.S.A.; LONDON, ENGLAND. ISBN 0-8391-0696-3. 1974 553-556
- CP** Klevay, L. M. 1996. iron overload induces hypercholesterolemia when dietary copper is marginal. *FASEB Journal* 10(3): A294.
- Unrel** Klevay, L. M. ischemic heart disease: toward a unified theory. *Reprints - U.s. Department Of Agriculture, Agricultural Research Service.* 1990. [401] 34 p.
- HHE** Klevay, L. M. 1974. the ratio of zinc to copper in milk and mortality due to coronary heartdisease: an association. 9-14.
- Abstract** Klevay, L. M., Evans, G. W., and Sandstead, H. H. zinc copper hyper cholesterolemia the effect

of sodium phytate. *AM J CLIN NUTR. American Journal of Clinical Nutrition.* 28 (4). 1975
426

- Prim** Klevay L M, Mendelsohn D, Vanderwatt J J, Davidson L M, and Kritchevsky D. 1981. aortic sudanophilia and zinc-copper ratios in the liver of vervet monkeys fed different types of dietary fibre. *SOUTH AFRICAN MEDICAL JOURNAL* 59. 120(17): 605-606, illustr.
- Prim** Klevay, L. M., Mendelsohn, D., Vanderwatt, J. J., Davidson, L. M., and Kritchevsky, D. aortic sudanophilia and zinc copper ratios in the liver of vervet monkeys *cercopithecus-aethiops-pygerythrus* fed different types of dietary fiber. *S AFR MED J. South African Medical Journal.* 59 (17). 1981. 605-606.
- Nut def** Klevay, L. M. and Moore, R. J. 1990. beer mitigates some effects of copper deficiency in rats. *American Journal of Clinical Nutrition* 51(5): 869-72.
- CP** Klevay, L. M. and Pond, W. G. decreased hdl cholesterol and apo a-1 in plasma of young pigs fed a diet high in zinc and adequate in copper. *MEETING OF THE AMERICAN SOCIETY FOR CLINICAL NUTRITION, INC. CLINICAL DIVISION OF THE AMERICAN INSTITUTE OF NUTRITION, WASHINGTON, D.C., USA, MAY 3-5, 1990. CLIN RES.* 38 (3). 1990. 751a.
- Nut def** Klevay, L. M., Pond, W. G., and Medeiros, D. M. 1994. decreased high density lipoprotein cholesterol and apoprotein a-i in plasma and ultrastructural pathology in cardiac muscle of young pigs fed a diet high in zinc. *Nutrition Research* 14(8): 1227-1239.
- CP** Klevay, L. M. and Saari, J. T. 1993. comparative responses of rats to different copper intakes and modes of supplementation. *Proceedings Of The Society For Experimental Biology And Medicine.* 203(2): 214-220.
- Nut def** Klevay, Leslie M. 1986. aspirin hypocholesterolemia associated with increased microsomal copper in liver. *Nutr. Res. (N. Y.)* 6(11): 1281-92 .
- No COC** Klevay, Leslie M. dietary cholesterol lowers liver copper in rabbits. *Biol. Trace Elem. Res.* (1988) 16(1): 51-7 .
- Nut def** Klevay, Leslie M. hypercholesterolemia in rats produced by an increase in the ratio of zinc to copper ingested. *Amer. J. Clin. Nutr.* (1973) 26(10): 1060-8 .
- No COC** Klevay, Leslie M. 1977. hypocholesterolemia due to sodium phytate. *Nutr. Rep. Int.* 15(5): 587-95 .
- CP** Klevay, Leslie M. 1974. interactions among dietary copper, zinc, and the metabolism of cholesterol and phospholipids. *Trace Elem. Metab. Anim. Proc. Int. Symp., 2nd* : Meeting Date 1973, 553-6. Editor(s): Hoekstra, W. G. Publisher: Univ. Park Press, Baltimore, Md.
- No COC** Klevay, Leslie M. metabolic interactions among cholesterol, cholic acid and copper. *Nutr. Rep. Int.* (1982) 26(3): 405-14 .
- HHE** Klevay, Leslie M. the ratio of zinc to copper in milk and mortality due to coronary heart disease: an association. *Trace Subst. Environ. Health* (1974) : 8, 9-14.
- HHE** Klevay, Leslie M., Vo-Khactu, Kim P., and Jacob, Robert A. the ratio of zinc to copper of cholesterol-lowering diets. *Trace Subst. Environ. Health* (1975) : 9, 131-8.
- HHE** Kligman, A. M. 1968. pathogenesis of acne vulgaris. ii. histopathology of comedones induced in the rabbit ear by human sebum. *Archives of Dermatology* 98(1): 58-66.

- No COC** Klopfenstein, C. F., Varriano-Marston, E., and Hosene, R. C. 1981. effects of ascorbic acid in casein vs. sorghum grain diets in guineapigs. *Nutrition Reports International* 24(5): 1017-1028.
- No COC** Klopfenstein, Carol F., Varriano-Marston, Elizabeth, and Hosene, R. Carl. effects of ascorbic acid in casein vs. sorghum grain diets in guinea pigs. *Nutr. Rep. Int. (1981)* 24(5): 1017-28 .
- FL** Kment, Alfred, Niedermueller, Hans, and Hofecker, Gerhard. gerontological studies on the calcium, magnesium, iron, copper, and zinc concentrations in the hearts and frontal cerebral lobes of rats. *Wien. Tieraerztl. Monatsschr. (1975)* 62(6-8): 224-31.
- Carcin** Knight, Elaine, Adkins, James, Knight, Enid, and Criss, Wayne E. 1983. the effect of dietary zinc and vitamin a on the growth of morris hepatoma 7800. *J. Nutr. Growth Cancer* 1(1): 57-65 .
- No Oral** Knight, T. W., Death, A. F., and Wyeth, T. K. 1996. effect of dietary zinc oxide on the plasma carotenoid concentration of steers. *New Zealand Journal of Agricultural Research* 39(2): 293-296.
- CP** Knochel, W., Poting, A., Koster, M., Elbaradi, T., Nietfeld, W., Bouwmeester, T., and Pieler, T. 1989. evolutionary conserved modules associated with zinc fingers in xenopus-laevis. *Proceedings Of The National Academy Of Sciences Of The United States Of America* 86(16): 6097-6100.
- Gene** Ko, L. J. and Engel, J. D. 1993. dna-binding specificities of the gata transcription factor family. *Molecular and Cellular Biology* 13(7): 4011-22.
- FL** Kobayashi, H., Abe, H., Awaya, A., Inano, H., and Shikita, M. 1990. serum thymic factor as a radioprotective agent promoting survival after x-irradiation. *Experientia* 46(5): 484-6.
- CP** Kobayashi, K., Watanabe, T., Tominaga, K., Fukuda, T., Higuchi, K., and Arakawa, T. 1993. effects of zinc-deficient diet on healing of gastric ulcers and cell proliferation in rats. *Gastroenterology* 104(4 SUPPL.): A120.
- Carcin** Kobayashi, Shizuko and Sayato-Suzuki, Junko. isolation of mouse isometallothioneins. a comparison of isometallothioneins in growing cells and post-mitotic cells. *Biochem. J. (1988)* 251(3): 649-55 .
- No COC** Kobayashi, T., Shiki, Y., Meyrick, B., Burr, I. M., and Newman, J. H. simultaneous exposure of sheep to endotoxin and 100 percent oxygen . *AM REV RESPIR DIS. American Review of Respiratory Disease.* 144 (3 Part 1). 1991. 600-605.
- Nut def** Kobayashi, T. and Tomita, H. 1986. electron microscopic observation of vallate taste buds of zinc-deficient rats with taste disturbance. *Auris, Nasus, Larynx* 13 Suppl 1: S25-31.
- Dead** KOBAYASHI, Y., SHIMADA, A., UMEMURA, T., and NAGAI, T. an outbreak of copper poisoning in mute swans (cygnus olor). *J VET MED SCI; 54 (2).* 1992. 229-233.
- Meth** Kobayashi, Yoshinori. development of an x-ray fluorescence element mapping spectrometer and its application to biological samples. *Kagaku Gijutsu Kenkyusho Hokoku (1989)* 84(12): 643-54
- Phys** Koch, M. and Ehret, G. 1991. parental behavior in the mouse: effects of lesions in the entorhinal/piriform cortex. *Behavioural Brain Research* 42(1): 99-105.

- Diss** Koch, R. 1988. mineralization of various bones in growing dogs. 130pp.
- FL** KOCIOVA, E., PETER, V., MIKULAJ, L., and HUSTAVOVA, H. H. antistress influence of high doses of chlortetracycline and zinc-bacitrin in the chicken. *POL'NOHOSPODARSTVO*; 15 (9). 1969 804-814
- Drug** Koefoed-Johnsen, H. H. and Brumerstedt, E. production of semen in a bull with lethal trait a-46 during peroral supplementation with zinc oxide. *Kongelige Veterinaer- Og Landbohøjskole Institut for Sterilitetsforskning Arsberetning*. 1984 (0). 1984. 119-123.
- Org Met** Koehler, Ann E., Tobin, Mark E., Goodall, Margaret J., and Sugihara, Robert T. weatherability and acceptance of selected commercial zinc phosphide rodent baits. *Int. Biodeterior. Biodegrad.* (1995) 36(1/2): 35-50
- CP** Koh, E. T. 1990. comparison of copper status in rats when dietary fructose is replaced by either cornstarch or glucose. *Proceedings of the Society for Experimental Biology and Medicine*; 194
- CP** Koh, E. T. and Carter, L. J. 1996. effects of sex hormones on zinc concentrations of hard and soft tissues of rats fed magnesium-deficient fructose diets. *FASEB Journal* 10(3): A531.
- CP** Koh, E. T. and Clarke, S. L. 1997. effects of fluoride and aluminum exposure to dams prior to and during gestation on mineral compositions of bone and selected soft tissues of female mice dams and pups. *FASEB Journal* 11(3): A406.
- In Vit** Koh, Gou Young, Kim, Seong-Jin, Klug, Michael G., Park, Keunchil, Soonpaa, Mark H., and Field, Loren J. targeted expression of transforming growth factor-beta.1 in intracardiac grafts promotes vascular endothelial cell dna synthesis. *J. Clin. Invest.* (1995) 95(1): 114-21
- No COC** Koh, Jin Bog, Jeung, Bok Mi, Kim, Jae Young, Choi, Do Jeom, and Yang, Cha Bum. effects of drinking water supplemented with copper on tissue concentrations of copper, iron and zinc in rats. *Han'Guk Yongyang Siklyong Hakhoechi* (1987) 16(2): 63-8 .
- Nut def** Koh, T. S., Peng, R. K., and Klasing, K. C. 1996. dietary copper level affects copper metabolism during lipopolysaccharide-induced immunological stress in chicks. *Poultry Science* 75(7): 867-872.
- FL** Kohler-Samouilidis, G., Schmidt-Adamopoulou, B., Samouilidis, S., Papaioannou, N., and Kotsaki-Kovatsi, V. P. 1997. [effects of captopril on the male reproductive organs and various semen parameters of rabbits]. <original> uber den einfluss von captopril auf die mannlichen geschlechtsorgane und verschiedene samenparameter von kaninchen. *Berliner Und Munchener Tierarztliche Wochenschrift* 110(6): 201-5.
- No COC** Kohler-Samouilidis, Gunda, Schmidt-Adamopoulou, B., Samouilidis, S., Papaioannou, N., and Kotsaki-Kovatsi, P. the effect of captopril on the male reproductive organs and various semen parameters of rabbits. *Berl. Muench. Tieraerztl. Wochenschr.* (1997) 110(6): 201-205.
- Nut def** KOHN, D. W. and KREITZMAN, S. N. birth defects:phytate induced zinc deficiency in rats. *J DENT RES* 55(SPEC ISS B):B176,1976
- Mix** Kohno, Tasuku, Qin, Man, Maki, Kenshi, Dai, Wenyu, and Nishioka, Takahiro. the effect of zinc and 1-alpha-hydroxyvitamin d3 on the mandible of growing rats. *Kyushu Shika Gakkai Zasshi* (1999) 53(4): 431-454.
- No COC** Kohout, M., Braun, T., and Novakova, A. 1966. changes in the fatty acid composition of adipose tissue in hyperphagic rats with a hypothalamic lesion and in rats after insulin administration.

- Prim** Koizumi, Naoko, Hatayama, Fumikazu, Akabori, Fumiaki, and Masaoka, Toshio. gel filtration pattern of cadmium, zinc, and copper in liver and renal cortex supernatants of cadmium-treated monkeys. *Kobe J. Med. Sci.* (1981) 27(6): 239-49.
- HHE** Kojima, Y. and Hamashima, Y. immuno histological studies of metallo thionein 2. its detection in the human fetal kidney. *Acta Histochemica Et Cytochemica.* 13 (3). 1980. 277-286.
- Unrel** Kokorev, V. A., Gur'yanov, A. M., and Tikhomirov, I. A. 1991. biological basis for zinc requirement of growing pigs at different ages. *Sel'Skokhozyaistvennaya Biologiya* (No.4): 80-87.
- FL** Kolb, E., Engmann, S., Klemm, R., and Nestler, K. 1995. content of trace elements and minerals (na, k, ca, mg, inorganic-p) and fe, cu and zn in ten different tissues of geese. *Tierarztliche Umschau* 50(1): 52-54, 57-60.
- FL** Kolb, E. and Kuba, M. 1994. biochemical analyses on beagle dogs . part 2. contents of sodium, potassium, calcium, magnesium, total phosphorus, iron, copper, and zinc in fetal tissue and in tissues of dogs of different ages. *Dtsch. Tieraerztl. Wochenschr.* 101(5): 117-82.
- FL** Kolb, E., Rehbein, S., Ribbeck, R., Alawad, A., Leo, M., and Siebert, P. 1993. the behaviour of haematological values (haemoglobin, haematocrit, leukocyte count) and of clinico-chemical values in the plasma (glucose, total protein, alpha-amino-n, urea, pepsinogen, ascorbic acid, fe, cu and zn) as well as that of ascorbic acid in the liver, spleen and adrenal glands in healthy lambs and in lambs infected with *haemonchus contortus* and *trichostrongylus colubriformis*. *Berliner Und Munchener Tierarztliche Wochenschrift* 106(12): 411-418.
- Abstract** Kolb, K. and Elsenhans, B. changes in the longitudinal distribution of trace metals and metallothionein in rat small intestine effects of dietary cadmium level feeding period and iron status. *30TH SPRING MEETING OF THE DEUTSCHE GESELLSCHAFT FUER PHARMAKOLOGIE UND TOXIKOLOGIE (GERMAN SOCIETY FOR PHARMACOLOGY AND TOXICOLOGY), MAINZ, WEST GERMANY, MARCH 14-17, 1989. NAUNYN-SCHMIEDEBERG'S ARCH PHARMACOL.* 339 (Suppl.). 1989. R19.
- CP** Kollmer, W. E. and Berg, D. the influence of a zinc calcium or iron deficient diet on the resorption and kinetics of cadmium in the rat. *SOUTHGATE, D. A. T., I. T. JOHNSON AND G. R. FENWICK (ED.). ROYAL SOCIETY OF CHEMISTRY AND SPECIAL PUBLICATIONS, NO. 72. NUTRIENT AVAILABILITY: CHEMICAL AND BIOLOGICAL ASPECTS; CONFERENCE, NORWICH, ENGLAND, UK, AUGUST 21-24, 1988. XIX+404P. ROYAL SOCIETY OF CHEMISTRY: CAMBRIDGE, ENGLAND, UK. ILLUS. ISBN 0-85186-856-8. 0 (0). 1989. 287-289.*
- CP** Kollmer, W. E. and Berg, D. 1986. the influence of zinc deficiency on the absorption, kinetics, and amount of zinc in hair of the rat. *Spurenelem.-Symp. 5th : Issue Trace Elements*, 502-8. Editor(s): Anke, Manfred. Publisher: Friedrich-Schiller-Univ. Jena, Jena, Ger. Dem. Rep..
- CP** Kollmer, W. E. and Berg, D. 1985. the influence of zinc deficiency on the intestinal resorption and transfer to hair of an ingested dose of zinc-65. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th : Meeting Date 1984, 404-6.* Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK..
- Nut def** Kollmer, W. E. and Berg, D. Inst fur Strahlenbiologie FRG. the influence of a zinc- calcium- or iron- deficient diet on the. *Nutrient Availability: Chem & Biol Aspects (Royal Soc Chem Bioavailability 88, Norwich, UK).* P287(3)

- Unrel** Kolokouris, I., Economides, N., Beltes, P., and Vlemmas, I. 1998. in vivo comparison of the biocompatibility of two root canal sealers implanted into the subcutaneous connective tissue of rats. *Journal of Endodontics* 24(2): 82-5.
- FL** Kolomaznik, J., Kalova, J., and Fic, V. Vysoka Skola Zemedelska Brno Czech Republic. 1993. calcium and magnesium contents in mink kidneys. <original> obsah vapniku a horciku v ledvinach norku v prubehu ontogeneze. *Veterinarstvi*. V. 43(2) P. 73-75
- FL** Koltun, E. M. 1985. amide concentrate supplements and premix in diets for cattle. *Zhivotnovodstvo* (4): 53-55.
- Unrel** Kolunie, J. M. and Stern, J. M. 1995. maternal aggression in rats: effects of olfactory bulbectomy, znso4-induced anosmia, and vomeronasal organ removal. *Hormones and Behavior* 29(4): 492-518.
- Phys** Komada, M. and Kitamura, N. 1995. growth factor-induced tyrosine phosphorylation of hrs, a novel 115-kilodalton protein with a structurally conserved putative zinc finger domain. *Mol. Cell. Biol.* Vol. 15, No. 11, Pp. 6213-6221
- Nut def** Komada, M. and Soriano, P. 1999. hrs, a fyve finger protein localized to early endosomes, is implicated in vesicular traffic and required for ventral folding morphogenesis. *Genes & Development* 13(11): 1475-85.
- FL** Komatsu, J., Takayama, S., Sasaki, T., Holland Junior, C., and Russo, M. [influence of zinc phosphate cement manipulation on pulpal response. histological study in dogs' teeth]. <original> influencia da manipulacao do cimento de fosfato de zinco na resposta pulpar. estudo histologico em dentes de caes. *Revista Da Faculdade De Odontologia De Aracatuba* 5(1-2): 127-34| CP- and Histology --AH; *Zinc Phosphate Cement --Adverse Effects --AE; Dental Pulp --Drug Effects --DE; Dogs; Histocytochemistry.
- CP** Komiskey, H. L., Chen, X. F., and Sarpong, D. 1997. memory in male rats impaired by subchronic zinc oxide. *Society for Neuroscience Abstracts* 23(1-2): 2120.
- Bio Acc** Komstaszumska, E. and Miller, D. R. 1984. interactions of calcium, copper, iron, and zinc with methylmercury and selenium in guinea-pig tissues. *Biological Trace Element Research* 6(6): 507-517.
- Mix** Komulainen, H. 1983. enhancement of 5-hydroxytryptamine uptake in rabbit hypothalamic synaptosomes but not in blood platelets by zinc and lead ex vivo. *Acta Pharmacologica Et Toxicologica* 53(2): 166-74.
- No Control** Kondo, H. and Osada, A. 1996. influence of dietary fiber on the bioavailability of zinc in rats. *Biomedical and Environmental Sciences* 9(2-3): 204-8.
- Nut def** Kondo, I., Ozono, S., Sato, K., and Ito, Y. 1989. histology of the submandibular gland in experimentally induced zinc-deficient mice. *Bulletin of the Kanagawa Dental College* 17(2): 159-63.
- Nut def** Kondo, I., Watanabe, Y., Ito, Y., and Hisada, T. 1987. a histochemical study of apud ability in the taste buds of experimentally induced zinc-deficient mice. *Journal of Oral Pathology* 16(1): 13-7.
- Nut def** Kondo, Isao, Watanabe, Y., Ito, Y., and Hisada, T. a histochemical study of apud ability in the taste buds of experimentally induced zinc-deficient mice. *J. Oral Pathol.* (1987) 16(1): 13-17.

- Unrel** Kondo Takeo, Reaume Andrew G, Huang Ting-Ting, Carlson Elaine, Murakami Kensuke, Chen Sylvia F, Hoffman Eric K, Scott Richard W, Epstein Charles J, and Chan Pak H(A). 1997. reduction of cuzn-superoxide dismutase activity exacerbates neuronal cell injury and edema formation after transient focal cerebral ischemia. *Journal of Neuroscience* 17(11): 4180-4189.
- Unrel** Kondo Yasuhiko(A), Tomihara Kazuya, and Sakuma Yasuo. 1999. sensory requirements for noncontact penile erection in the rat. *Behavioral Neuroscience* 113(5): 1062-1070.
- FL** Kondratenko, Z. h. E., Kostava, V. T., Bakuleva, N. P., Tereshchenkova, I. A., and Antipas, D. B. 1998. [physical-mechanical and functional characteristics of xenograft during various methods of stabilization and treatment]. <original> fiziko-mekhanicheskie i funktsional'nye kharakteristiki ksenotkani pri razlichnykh vidakh stabilizatsii i obrabotki. *Meditinskaya Tekhnika* (4): 20-3.
- FL** Kong, Qinghu, Chen, Yunjing, Wu, Jianmin, Jin, Feng, and He, Ling. effects of zinc on teratogenic effect of cadmium. *Zhonghua Yufangyixue Zazhi* (1986) 20(4): 236-7.
- FL** Kong, Xiangying, Cao, Kaigui, Bai, Jiasi, and He, Zehua. effects of dietary zinc on contents of monamine transmitters, zinc, copper and iron in brain in young rats. *Zhongguo Gonggong Weisheng Xuebao* (1998) 17(5): 345-346 .
- FL** Kong, Xiangying, Liu, Lijian, Sheng, Xilian, Ren, Rongna, and Bai, Jiasi. effects of excessive zinc in fodder on brain development and abilities of learning and memory and their mechanisms in young rats. *Zhonghua Yufang Yixue Zazhi* (1998) 32(4): 225-228.
- FL** Kong, Xiangying, Ren, Rongna, Liu, Lijian, Sheng, Xilian, and Bai, Jiasi. effects of zinc deficiency in fodder on brain development learning and memory in rats. *Zhonghua Yufang Yixue Zazhi* (1997) 31(5): 295-298.
- FL** Kong, Xiangying, Ren, Rongna, Luo, Dongming, Bai, Jiashi, and Wang, Yijian. the influence of dietary zinc levels on the hippocampal development and learning memory in young rats. *Yingyang Xuebao* (1996) 18(4): 434-440.
- Phys** Kong Xue-Jun(A), Lee Sheu-Ling, Lanzillo Joseph J, and Fanburg Barry L. 1993. copper, zinc superoxide dismutase in vascular cells: changes during cell cycling and exposure to hyperoxia. *American Journal of Physiology* 264(4 PART 1): L365-L375.
- In Vit** Kong, Zwe-Ling and Yeh, Fu-Lung . 1997. cell death of serum-free mouse embryo (sfme) in culture supplied with bovine serum. *Anim. Cell Technol.: Basic Appl. Aspects Proc. Annu. Meet. Jpn. Assoc. Anim. Cell Technol., 8th* : Meeting Date 1995, 409-413. Editor(s): Funatsu, Kazumori; Shirai, Yoshihito; Matsushita, Taku. Publisher: Kluwer, Dordrecht, Neth.
- Nut** Koniaris, Soula G., Fisher, Stanley E., Rubin, Clinton T., and Chawla, Anupama. experimental colitis impairs linear bone growth independent of nutritional factors. *J. Pediatr. Gastroenterol. Nutr.* (1997) 25(2): 137-141.
- Nut** Koniaris Soula G, Fisher Stanley E, Rubin Clinton T, and Chawla Anupama(A). 1997. correction of previews 99688215. experimental colitis impairs linear bone growth independent of nutritional factors. correction of journal title from journal of pediatric gastroenterology and nutrition. *JPGN* 25(2): 137-141.
- Unrel** Konrat, R., Krautler, B., Weiskirchen, R., and Bister, K. 1998. structure of cysteine- and glycine-rich protein crp2. backbone dynamics reveal motional freedom and independent spatial orientation of the lim domains. *Journal of Biological Chemistry* 273(36): 23233-40.
- No Org** Konrat, R., Weiskirchen, R., Bister, K., and Kraeutler, B. 1998. bispheric coordinative

structuring in a zinc finger protein: nmr analysis of a point mutant of the carboxy-terminal lim domain of quail cysteine- and glycine-rich protein crp2. *Vol. 120, No. 28, Pp. 7127-7128*
Journal Of The American Chemical Society

- Unrel** Konrat, Robert, Weiskirchen, Ralf, Krautler, Bernhard, and Bister, Klaus. solution structure of the carboxyl-terminal lim domain from quail cysteine-rich protein crp2. *J. Biol. Chem. (1997)* 272(18): 12001-12007.
- Unrel** Kontaxis, G., Konrat, R., Krautler, B., Weiskirchen, R., and Bister, K. 1998. structure and intramodular dynamics of the amino-terminal lim domain from quail cysteine- and glycine-rich protein crp2. *Biochemistry* 37(20): 7127-34.
- FL** Kontsevenko, V. V. 1987. experimental parakeratosis in young pigs. *Veterinariya, Moscow* (6): 50-52.
- FL** Kontsevenko, V. V. and Kogan, E. S. 1985. resistance to infection in piglets on inadequate mineral nutrition. *Veterinariya, Moscow, USSR* (5): 59-60.
- FL** Kontsevenko, V. V. Agricultural Academy Belgorod Russia, Marusich, A. G., and Sit'ko, V. A. eds. 1998. [actual problems of mineral nutrition of pigs in conditions of industrial technology]. <original> aktual'nye problemy mineral'nogo pitaniya svinej v usloviyakh promyshlennoj tekhnologii. [current problems of intensive development of animal husbandry]. <original> aktual'nye problemy intensivnogo razvitiya zhivotnovodstva. 248 P. P. 41-44
- No Oral** Koo, P. H. and Stach, R. W. 1989. interaction of nerve growth factor with murine alpha-macroglobulin. *Journal of Neuroscience Research* 22(3): 247-61.
- Nut** Koo, S. I., Dodds, S. J., and Mercer, L. P. 1986. optimization of the dietary level of histidine in relation to the serum concentrations of zinc and copper in the weanling rat. *Nutrition Research* 6(8): 967-979.
- Drug** Koo, S. I., Fullmer, C. S., and Wasserman, R. H. 1980. effect to cholecalciferol and 1,25-dihydroxycholecalciferol on the intestinal absorption of zinc in the chick. *Journal of Nutrition* 110(9): 1813-8.
- Nut def** Koo, S. I., Norvell, J. E., Algilani, K., and Chow, J. effect of marginal zinc deficiency on the lymphatic absorption of carbon-14 cholesterol. *J NUTR. Journal of Nutrition. 116 (12). 1986 (Recd. 1987). 2363-2371.*
- Nut def** Koo, S. I. and Turk, D. E. 1977. effect of zinc deficiency on intestinal transport triglyceride in the rat. *Journal of Nutrition* 107(5): 909-19.
- Nut def** Koo, S. I. and Turk, D. E. 1977. effect of zinc deficiency on the ultrastructure of the pancreatic acinar cell and intestinal epithelium in the rat. *Journal of Nutrition* 107(5): 896-908.
- Nut** Koo, S. I. and Williams, D. A. 1981. relationship between the nutritional status of zinc and cholesterol concentration of serum lipoproteins in adult male rats (copper nutriture). *American Journal Of Clinical Nutrition. 34 (11): 2376-2381.*
- Mix** Koo, Sung I., Dodds, S. J., and Mercer, L. P. optimization of the dietary level of histidine in relation to the serum concentrations of zinc and copper in the weanling rat. *Nutr. Res. (N. Y.) (1986) 6(8): 967-79.*
- Mix** Koo, Sung I., Fullmer, Curtis S., and Wasserman, Robert H. effect of cholecalciferol and 1,25-dihydroxycholecalciferol on the intestinal absorption of zinc in the chick. *J. Nutr. (1980)*

110(9): 1813-18.

- Nut def** Koo, Sung I., Henderson, D. A., Algilani, K., and Norvell, J. E. effect of marginal zinc deficiency on the morphological characteristics of intestinal nascent chylomicrons and distribution of soluble apoproteins of lymph chylomicrons. *Am. J. Clin. Nutr.* (1985) 42(4): 671-80.
- Nut def** Koo, Sung I. and Lee, Christine C. cholesterol and apolipoprotein distribution in plasma high-density- lipoprotein subclasses from zinc-deficient rats. *Am. J. Clin. Nutr.* (1989) 50(1): 73-9.
- Nut def** Koo, Sung I. and Lee, Christine C. compositional changes in plasma high-density lipoprotein particles in marginally zinc-deficient male rats. *Am. J. Clin. Nutr.* (1988) 47(1): 120-7
- Nut def** Koo, Sung I. and Lee, Christine C. effect of marginal zinc deficiency on lipoprotein lipase activities in postheparin plasma, skeletal muscle and adipose tissues in the rat. *Lipids* (1989) 24(2): 132-6.
- Nut def** Koo, Sung I., Lee, Christine C., and Norvell, John E. effect of marginal zinc deficiency on the apolipoprotein-b content and size of mesenteric lymph chylomicrons in adult rats. *Lipids* (1987) 22(12): 1035-40.
- Nut def** Koo, Sung I., Norvell, John E., Algilani, K., and Chow, Jasmine. effect of marginal zinc deficiency on the lymphatic absorption [¹⁴C]cholesterol. *J. Nutr.* (1986) 116(12): 2363-71.
- Nut** Koo, Sung I. and Ramlet, James S. 1984. effect of dietary linoleic acid on the tissue levels of zinc and copper, and serum high density lipoprotein cholesterol. *Atherosclerosis (Shannon Irel.)* 50(2): 123-32 .
- Nut def** Koo, Sung I. and Turk, D. E. effect of zinc deficiency on intestinal transport of triglyceride in the rat. *J. Nutr.* (1977) 107(5): 909-19.
- Nut def** Koo, Sung I. and Turk, D. E. effect of zinc deficiency on the ultrastructure of the pancreatic acinar cell and intestinal epithelium in the rat. *J. Nutr.* (1977) 107(5): 896-908.
- Nut def** Koo, Sung I. and Williams, Dale A. relationship between the nutritional status of zinc and cholesterol concentration of serum lipoproteins in adult male rats. *Am. J. Clin. Nutr.* (1981) 34(11): 2376-81.
- FL** KOOIKER, G. recommendations for analytical methods of heavy metals in bird eggs and feathers with atomic-absorption spectrophotometry. *J ORNITHOL*; 127 (1). 1986. 9-24.
- Gene** Kopchick, J. J. 1990. bovine growth hormone gene expression in cultured avian cells. *Napjaink Biotechnologia* (25): 130-139.
- No Oral** Koppel, J., Kuchar, S., Mozes, S., and Bod'a, K. nucleic acids and protein content of some fetal and neonatal rat organs after insulin treatment. *Endokrinologie* (1981) 77(1): 95-100 .
- No COC** Koppelman, M. C. S. 1988. a potential role for prolactin in zinc homeostasis. *Medical Hypotheses* 25(2): 65-68.
- FL** Korablec, M. V. and Evets, M. A. 1977. [antidiuretic activity of dithiocarbamic acid derivatives]. <original> antidiuretičeskaia aktivnost' proizvodnykh ditiokarbaminovoi kisloty. *Farmakologija i Toksikologija* 40(5): 603-6.
- FL** Korablev, M. V. and Evets, M. A. anti diuretic action of di thio carbamic-acid derivatives. *Farmakologija i Toksikologiya (Moscow)*. 40 (5). 1977 (Recd 1978) 603-606.

- IMM** Koranyi, L., Peterfy, F., Paksy, A., and Vargha, P. production of glucagon antibodies by thyroglobulin zinc glucagon conjugate. *Hormone and Metabolic Research*. 9 (5). 1977 434-435.
- Nut def** Koreleski, J. 1972. some physiological consequences in rats of feeds with different amounts of copper and antagonistic elements. *Acta Agraria Et Silvestria, Zootechnica* 12(2): 17-31.
- FL** Koreleski, Jerzy. 1970. effect of some trace elements contained in feed rations on the nutritive value indexes of protein. *Sitzungsber. Deut. Akad. Landwirtschaftswiss. Berlin (1972)* 19(3): 73-80
- No Tox** Korge, P., Masso, R., and Roosson, S. 1974. the effect of physical conditioning on cardiac response to acute exertion. *Canadian Journal of Physiology and Pharmacology* 52(3): 745-52.
- No Oral** Korhonen, A., Hemminki, K., and Vainio, H. embryo toxicity of industrial chemicals on the chicken embryo di thio carbamates. *Teratogenesis Carcinogenesis and Mutagenesis*. 3 (2). 1983. 163-176.
- No COC** KORHONEN, A., HEMMINKI, K., and VAINIO, H. embryotoxicity of benzothiazoles, benzenesulfohydrazide, and dithiodimorpholine to the chicken embryo. *ARCH ENVIRON CONTAM TOXICOL* 11:753-759,1982
- No COC** KORHONEN, A., HEMMINKI, K., and VAINIO, H. toxicity of rubber chemicals towards three-day chicken embryos. *SCAND J WORK ENVIRON HEALTH* 9:115-119,1983
- FL** Kormushkin, A. 1989. feed antibiotics. *Ptitsevodstvo* (6): 27-29.
- Abstract** Kornegay, E. T., Cheng, J., and Schell, T. C. 1996. apparent zinc absorption and dry matter digestibility in the stomach, intestine and lower colon of weanling pigs fed an inorganic or organic zinc source added to adequate and deficient lysine diets. *Journal of Animal Science* 74(SUPPL. 1): 182.
- Abstract** Kornegay, E. T., Hedges, J. D., and Martens, D. C. soil corn plant and grain mineral levels following 3 years of applying feces from pigs fed high and low dietary copper levels. *VA J SCI. Virginia Journal of Science*. 26 (2). 1975 43
- Soil** Kornegay, E. T., Hedges, J. D., Martens, D. C., and Kramer, C. Y. 1976. effect on soil and plant mineral levels following application of manures of different copper contents. *Plant and Soil*. 45(1): 151-162.
- Nut** Kornegay, E. T., Holland, M. R., Webb, K. E. Jr, Bovard, K. P., and Hedges, J. D. nutrient characterization of swine fecal waste and utilization of these nutrients by swine. *Journal of Animal Science*. 44 (4). 1977 608-619.
- Nut def** Kornegay, E. T., Swinkels, J. W. G. M., Webb, K. E. Jr., Lindemann, M. D., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. absorption of zinc from zinc amino acid chelate and zinc sulfate during repletion of zinc depleted pigs. 398-399.
- No COC** Kornegay, E. T. and Thomas, H. R. 1975. effect of rotating or withdrawing dietary antibiotics on subsequent feedlot performance of swine. *Feedstuffs, USA* 47(11): 21-22.
- No COC** Kornegay, E. T., Thomas, H. R., and Kramer, C. Y. 1975. effect on subsequent feedlot performance of rotating or withdrawing dietary antibiotics from swine growing and finishing rations. *Journal of Animal Science*. 41(6): 1555-1562.
- Org Met** Korniewicz, A., Kirschke, A., Klawe, W., and Harenza, T. 1982. effect of biostimulants on

rearing piglets and weaners. *Biuletyn Informacyjny Przemysłu Paszowego* 21(1/2): 1-14.

- Abstract** Koroly, M. J., Saboori, A., and Young, M. control of auto catalytic self activation of nerve growth factor by zinc ion. *71ST ANNUAL MEETING OF THE AM. SOC. BIOL. CHEM. HELD WITH THE BIOPHYS. SOC., NEW ORLEANS, LA., USA, JUNE 1-6, 1980. FED PROC.* 39 (6). 1980. Abstract 1368.
- Alt** Koropatnick, J. and Cherian, M. G. 1994. metallothionein protein and mrna in the toxic milk mouse. *Vol. 304, No. 1, Pp. 318-319 Biochem. J.*
- FL** Korovina, E. K. and Morozov, A. Z. effect of dietary correction of zinc insufficiency on sheep fertility. *Doklady Vsesoyuznoi Ordena Lenina Akademii Sel'Skokkhozaistvennykh Nauk Imeni V I Lenina.* 1. 1976 35-36
- FL** Korovina, E. K. and Morozov, A. Z. 1976. effect of zinc supplements in deficiency on fertility of sheep. *Doklady Vsesoyuznoi Ordena Lenina Akademii Sel'Skokkhozaistvennykh* (1): 35-36.
- FL** Korovina, E. K. and Morozov, A. Z. 1976. influence of zinc supplementation on the fertility of rams and ewesdeficient in this element. *Doklady Vsesoyuznoi Akademii Sel'Skokkhozaistvennykh Nauk* (1): 35-36, 47.
- Mineral** Kortelainen, Sinikka. effect of fluoride in drinking water on the mineral composition of various areas of rat molar dentin. *Fluoride (1995)* Volume Date 1995, 28(3): 135-45
- Aquatic** Korver, R. M. and Sprague, J. B. 1989. zinc avoidance by fathead minnows (pimephales-promelas) - computerized tracking and greater ecological relevance. *Canadian Journal Of Fisheries And Aquatic Sciences* 46(3): 494-502.
- Unrel** Koshy, Kalavelil M., Wang, Jianyao, and Boggs, Joan M. divalent cation-mediated interaction between cerebroside sulfate and cerebroside: an investigation of the effect of structural variations of lipids by electrospray ionization mass spectrometry. *Biophys. J. (1999)* 77(1): 306-318.
- Bio Acc** Kosowska Barbara. 1992. changes in copper and zinc ion concentrations and serum insulin level in rats affected by inbreeding and stress. *Journal of Animal Breeding and Genetics* 109(5): 394-400.
- FL** Kossakowski, Stefan, Zuk, Maria, Grosicki, Andrzej, and Dziura, Adolf. studies on the effect of chemical pollution of the environment on distribution of trace elements in animals. *Med. Weter. (1985)* 41(2): 103-6.
- No Dose** Kossila, V., Tanhuanpaa, E., Virtanen, E., and Luoma, E. 1972. hb value, blood glucose, cholesterol, minerals and trace elements insaddle horses. 1. differences due to age and maintenance. *Journal of the Scientific Agricultural Society of Finland* 44(4): 249-257.
- FL** Kostadinov, K., Drumev, D., and Pashov, D. 1985. [ergotrophic action of flavophospholipol during the fattening of geese]. <original> ergotropnoto deistvie na flavofosfolipola pri ugoiavane na guski. *Veterinarno-Meditsinski Nauki* 22(2): 74-80.
- Alt** Kostic, V., Jackson Lewis, V., de Bilbao, F., Dubois Dauphin, M., and Przedborski, S. 1997. bcl-2: prolonging life in a transgenic mouse model of familial amyotrophic lateral sclerosis. *Vol. 277, No. 5325, Pp. 559-562 Science (Wash.)*
- FL** Kostina, T. E. and Khasibullin, R. Kh. 1987. concentrations of iron, copper, cobalt and zinc in blood of sheep inrelation to age. <document title>morfo-funktsional'nie izmeneniya v organizmezhivotnykh pri vozdeistvii vneshnikh faktorov. 76-78.

- FL** KOTAKE, K. effects of polyoxin-zinc salt on the following generations in rats. *NICHIDAI IGAKU ZASSHI* 38:847-857,1979
- Rev** Koterba, A. M., Brewer, B. D., and Tarplee, F. A. 1984. clinical and clinicopathological characteristics of the septicemic neonatal foal: review of 38 cases. *Equine Veterinary Journal* 16(4): 376-383.
- No COC** KOTEROV, A. N. content of metallothioneins in the liver, bone marrow and lymphocytes of ethanol-treated rats. *VOPROSY MEDITSINSKOI KHIMII*; 40 (5). 1994. 15-17.
- FL** Koterov, A. N., Sazykin, A. I. u., and Filippovich, I. V. 1993. [lowering the acute toxicity of ethanol with a zinc-metallothionein compound]. <original> snizhenie ostroi toksichnosti etanola preparatom tsink-metallotioneina. *Biulleten' Eksperimental'noi Biologii i Meditsiny* 115(1): 39-40.
- Unrel** Koterov, A. N., Trebenok, Z. A., and Filippovich, I. V. 1994. protection of mice from ionizing radiation by exogenous zinc-thionein. *Byulleten' Eksperimental'noi Biologii i Meditsiny* 118(8): 139-141.
- No COC** Kotsaki-Kovatsi, V. P., Kovatsi, L., Koehler-Samouilidou, G., and Bacoyanni, E. 1998. effect of inositolhexaphosphoric acid (phytic acid) on the distribution of calcium and zinc in rat tissues. *Met. Ions Biol. Med. Proc. Int. Symp., 5th* : 233-237. Editor(s): Collery, Phillipe. Publisher: Libbey Eurotext, Montrouge, Fr..
- No COC** Kott, J. N., Kenney, N. J., Bhatia, A. J., and Bhatia, A. M. 1989. response to chronic insulin administration: effect of area postrema ablation. *Physiology & Behavior* 46(6): 971-6.
- No Oral** Kotti, T., Riekkinen, P. J. Sr, and Miettinen, R. 1997. characterization of target cells for aberrant mossy fiber collaterals in the dentate gyrus of epileptic rat. *Experimental Neurology* 146(2): 323-30.
- Nut** Kotula, K. T., Nikazy, J. H., McGinnis, N., and Briggs, G. M. development of a rat model to test the nutritional equivalency of traditional vs. fabricated foods cheddar cheese vs. fabricated cheddar cheese. *Journal of Food Science*. 48 (6). 1983. 1674-1677, 1704.
- Fate** Kovar, J., Brzobohaty, B., and Studnickova, M. polarographic study of zinc binding to glutamate dehydrogenase ec-1.4.1.2. *Bioelectrochemistry and Bioenergetics*. 9 (3). 1982. 345-356.
- Unrel** Kovar, J., Brzobohaty, B., and Studnickova, M. polarographic study of zinc bound to alcohol dehydrogenase ec-1.1.1.1. *Bioelectrochemistry and Bioenergetics*. 9 (3). 1982. 333-344.
- Unrel** Kovar, J., Klukanova, H., Studnickova, M., Zeppezauer, M., and Maret, W. polarographic study of horse liver alcohol dehydrogenase lacking zinc ions at the active sites. *Bioelectrochemistry and Bioenergetics*. 13 (4-6). 1985. 407-416.
- FL** Kovtuniak, N. A. and Tsapok, P. I. 1971. [effect of thyroidectomy on microelement levels in the pancreas, its morphology and function]. <original> vlianie tireoidektomii na sodержanie microelementov v podzheludochnoi zheleze, ee morfologiiu i funktsiiu. *Problemy Endokrinologii* 17(3): 101-4.
- CP** Kowalczyk Krystyna, Stryjecka-Zimmer Maria, and Sanecka-Obacz Maria. 1995. antioxidant enzyme activities in different brain areas of the neurological mutant: pt rabbit. *Acta Neurobiologiae Experimentalis (Warsaw)* 55(SUPPL.): 50.
- Drug** Koyuncuoglu, H., Hatipoglu, I., and Sarica, O. 1994. morphine physical dependence

intensification by hypoglycemia: nmda receptor involvement. *Pharmacology, Biochemistry, and Behavior* 48(3): 571-4.

- FL** KOZIK, M. B. light microscopic and ultrastructural morphology of the brain in zinc chloride intoxication. *NEUROPATOL POL*; 18 (3). 1980. 431-445.
- No Oral** Kozik, Miroslaw B. light microscopic and ultrastructural morphology of the brain in zinc chloride poisoning. *Neuropatol. Pol.* (1980) 18(3): 431-45.
- FL** Kozikov, E. V. 1985. growth and development of black pied heifers 6 to 18 months old fed on diets supplemented with minerals and vitamins. *Byulleten' Vsesoyuznogo Nauchno-Issledovatel'skogo Instituta Razvedeniya i Genetiki Sel'skokhozyaistvennykh Zhivotnykh* (79): 17-20.
- Mix** Kozłowska, K., Brzozowska, A., Sulkowska, J., Roszkowski, W., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. the effect of cadmium supplied orally on iron, zinc and copper in rat tissue. 581-582.
- CP** Kozłowska, K., Konarzewska, M., and Brzozowska, A. 1994. apparent absorption of Fe, Zn, and Cu in rats as affected by diet supplementation with these minerals. *Defizite Ueberschuesse Mengen- Spurenelemente. Ernähr. Jahrestag. Ges. Mineralstoffe Spurenelemente.*, 10th : 216-23. Editor(s): Anke, Manfred; Meissner, Dieter. Publisher: Verlag Harald Schubert, Leipzig, Germany..
- Nut def** Kozma, M. and Szerdahelyi, P. zinc deficiency induced trace element concentration and localization changes in the central nervous system of albino rat during postnatal development 1. optical microscopic histochemical examinations. *Acta Histochemica.* 70 (1). 1982. 54-61.
- In Vit** Kozma, Maria and Ferke, Andras. trace element localization and changes in zinc and copper concentrations during postnatal development of the rat CNS. *Acta Histochem.* (1979) 65(2): 219-27 .
- Nut def** Kozma, Marta and Szerdahelyi, Peter. zinc deficiency-induced trace element concentration and localization changes in the central nervous system of albino rat during postnatal development . i. optical microscopic histochemical examinations. *Acta Histochem.* (1982) 70(1): 54-61.
- In Vit** KOZUKA, H. interactive exhibition of heavy metal toxicity in bone metabolism. from the viewpoint of deductive toxicology. *YAKUGAKU ZASSHI*; 115 (3). 1995. 157-169.
- Nut def** Kraft, S. P., Parker, J. A., Matuk, Y., and Rao, A. V. 1987. the rat electroretinogram in combined zinc and vitamin A deficiency. *Investigative Ophthalmology & Visual Science* 28(6): 975-84.
- Nut def** Kraft, Stephen P., Parker, John A., Matuk, Yousef, and Rao, A. Venker. 1987. the rat electroretinogram in combined zinc and vitamin A deficiency. *Invest. Ophthalmol. Visual Sci.* 28(6): 975-84 .
- Nut def** Kralik, A., Eder, K., and Kirchgessner, M. influence of zinc and selenium deficiency on parameters relating to thyroid hormone metabolism. *Horm. Metab. Res.* (1996) 28(5): 223-226.
- Nut** Kramer, K., Markwitan, A., Menne, A., and Pallauf, J. zinc metabolism in fasted rats. *J. Trace Elem. Electrolytes Health Dis.* (1993) 7(3): 141-6.
- In Vit** Kramer, K., Markwitan, A., and Pallauf, J. 1993. studies on the metabolism of metallothionein and alkaline phosphatase of adult rat primary hepatocyte cultures: role of fetal calf serum and

agonists of the phosphoinositide cascade. *Zeitschrift Fur Ernährungswissenschaft* 32(3): 176-86.

- Nut def** Kramer, T. R. 1984. reevaluation of zinc deficiency on concanavalin-a-induced rat spleen lymphocyte proliferation. *The Journal Of Nutrition*. 114 (5): 953-963.
- Nut def** Kramer, T. R., Briske-Anderson, M., Johnson, S. B., and Holman, R. T. influence of reduced food intake on poly unsaturated fatty-acid metabolism in zinc deficient rats. *Journal of Nutrition*. 114 (7). 1984. 1224-1230.
- Nut def** Kramer, T. R., Briske-Anderson, M., Johnson, S. B., and Holman, R. T. influence of reduced food intake on polyunsaturated fatty acid metabolism in zinc-deficient rats (protein-energy deficiency). *The Journal Of Nutrition*. July 1984. v. 114 (7) p. 1224-1230. ill.
- Abstract** Kramer, T. R., Briske-Anderson, M., Johnson, S. B., and Holman, R. T. influence of zinc on phospho lipids of nonlymphoid and lymphoid tissues and proliferation of splenic lymphocytes. 68TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 1-6, 1984 FED PROC. 43 (3). 1984. Abstract 2254.
- Nut def** Kramer, T. R., Briske-Anderson, M., Johnson, S. B., and Holman, R. T. 1986. polyunsaturated fatty acid patterns in lymphoid and nonlymphoid tissues of zinc deficient and pair-fed rats. *Nutrition Research*. 6(9): 1063-1074.
- Nut def** Kramer, Tim R. reevaluation of zinc deficiency on concanavalin-a-induced rat spleen lymphocyte proliferation. *J. Nutr.* (1984) 114(5): 953-63.
- Nut def** Kramer, Tim R., Briske-Anderson, Mary, Johnson, Susan B., and Holman, Ralph T. influence of reduced food intake on polyunsaturated fatty acid metabolism in zinc-deficient rats. *J. Nutr.* (1984) 114(7): 1224-30.
- Nut def** Kramer, Tim R., Briske-Anderson, Mary, Johnson, Susan B., and Holman, Ralph T. polyunsaturated fatty acid patterns in lymphoid and nonlymphoid tissues of zinc deficient and pair-fed rats. *Nutr. Res. (N. Y.)* (1986) 6(9): 1063-74.
- CP** Kramer, Tim R. and Highison, Barbara W. 1982. dietary zinc requirement for concanavalin a-responsive rat spleen lymphocytes. *Annu. Symp. Fundam. Cancer Res. [Proc.]* 34th(1982): (Mol. Interrelat. Nutr. Cancer), 91-103 .
- FL** Krammer, E. B. and Zenker, W. 1975. effect of zinc ions on structure and distribution of neurotubules (author's transl)]. <original> effekt von zinkionen auf struktur und verteilung der neurotubuli. *Acta Neuropathologica* 31(1): 59-69.
- Bio Acc** Krantz, W. C., Mulhern, B. M., Bagley, G. E., Sprunt, A., Ligas, F. J., and Robertson, W. B. Jr. 1970. organochlorine and heavy metal residues in bald eagle eggs. *Pestic Monit J.* 4(3): 136-40.
- Nut** Krasicka Barbara(A), Gralak Mikolaj A, Sieranska Bogumila, and Kulasek Gustaw. 1999. the influence of dietary sulphur loading on metabolism and health in young sheep fed low fibre and high starch diet. *Reproduction Nutrition Development* 39(5-6): 625-636.
- FL** KRASOVSKII, G. N. and AIRAPETOVA, L. N. toxicological and hygienic regulation of zinc 1-hydroxyethylidenediphosphonate in water with regard to its gonado- and embryotropic effects. *GIG SANIT (2)*:88-89,1983

- FL** Krasovskii, G. N., Zhurkov, V. S., Dergacheva, T. S., Alekseeva, T. V., Antonova, M. G., Spasskii, A. S., and Salamatova, O. G. 1993. [hygienic standardization of realon and zinc complex iomc-1 in water reservoirs]. <original> gigenicheskoe normirovanie realona i tsinkovogo kompleksa ioms-1 v vode vodoemov. *Gigiena i Sanitariia* (11): 15-6.
- No COC** Krasowska, A. and Wlostowski T. 1996. photoperiodic evaluation of testicular zinc protects seminiferous tubules against fluoride toxicity in the bank vole (*Clethrionomys glareolus*). *Comp.Biochem.Physiol.C.* 113(1): 81-84.
- No COC** Krasowska, Alicja and Wlostowski, Tadeusz. 1996. photoperiodic elevation of testicular zinc protects seminiferous tubules against fluoride toxicity in the bank vole (*Clethrionomys glareolus*). *Comp. Biochem. Physiol. C: Pharmacol., Toxicol. Endocrinol.* 113C(1): 81-4 .
- Phys** Krasowski, Matthew D., Rick, Caroline E., Harrison, Neil L., Firestone, Leonard L., and Homanics, Gregg E. a deficit of functional gabaa receptors in neurons of .beta.3 subunit knockout mice. *Neurosci. Lett.* (1998) 240(2): 81-84.
- FL** Krasucki, W. and Grela, E. 1994. effect of feeding sows on a complete mixture containing rapeseed "00"oilmeal on blood picture and blood mineral content. *Annales Universitatis Mariae Curie-Sklodowska. Sectio EE Zootechnica* 12: 229-236.
- FL** Kratky, F. and Kukula, F. 1975. contents of zinc, copper, iron and cobalt in organs of piglets in relation to age. *Zivocisna Vyroba* 19(10): 785-793.
- Nut def** Kraus, A., Roth, H. P., and Kirchgessner, M. influence of antioxidants (vitamin c, vitamin e, and .beta.-carotene) on osmotic fragility and components of the primary antioxidant system of erythrocytes in zinc-deficient rats. *Trace Elem. Electrolytes* (1997) 14(1): 30-37.
- Nut def** Kraus, A., Roth, H. P., and Kirchgessner, M. 1997. influence of vitamin c, vitamin e and beta - carotene on the osmotic fragility and the primary antioxidant system of erythrocytes in zinc-deficient rats. *Archives of Animal Nutrition* 50(3): 257-269.
- Nut** Kraus, Anton, Roth, Hans-Peter, and Kirchgessner, Manfred. supplementation with vitamin c, vitamin e or .beta.-carotene influences osmotic fragility and oxidative damage of erythrocytes of zinc-deficient rats. *J. Nutr.* (1997) 127(7): 1290-1296.
- Bact** Krawiec, D. R., Osborne, C. A., Leininger, J. R., and Griffith, D. P. 1984. effect of acetohydroxamic acid on prevention of canine struvite uroliths. *American Journal of Veterinary Research.* 45(7): 1276-1282 .
- No Oral** Krawiec, D. R., Osborne, C. A., Leininger, J. R., and Griffith, D. P. 1984. (i) effect of acetohydroxamic acid on dissolution of canine struvite uroliths. (ii) effect of acetohydroxamic acid on prevention of canine struvite uroliths. *American Journal of Veterinary Research* 45(7): 1266-1282.
- In Vit** Kream, R. M., Davis, B. J., Kawano, T., Margolis, F. L., and Macrides, F. substance p and catecholaminergic expression in neurons of the hamster main olfactory bulb. *Journal of Comparative Neurology.* 222 (1). 1984. 140-154.
- Nut def** Kreavich, M. E., Meyer, J., and Waterhouse, J. P. 1981. increased numbers of mast cells in the hyperplastic buccal mucosa of the zinc-deficient rat. *Journal of Oral Pathology* 10(1): 22-31.
- In Vit** Kremerskothen, J. and Barnekow, A. 1993. determination of phosphotyrosine phosphatase (ptpase) activity in normal and transformed cells. *Molecular and Cellular Biochemistry* 125(1): 1-9.

Unrel	KRESHOVER, S. J., CLOUGH, O. W., and BEAR, D. M. prenatal influences on tooth development.1.alloxan diabetes in rats. <i>J DENT RES</i> 32:246-261,1953
No Oral	Kretzschmar, P., Brewer, G. J., and Walker, S. E. depot-zinc therapy of systemic lupus erythematosus in b/w mice. <i>Proc. Soc. Exp. Biol. Med. (1981)</i> 168(3): 301-5
Carcin	Kreutzfeld, K. L., Lei, K. Y., Bregman, M. D., and Meyskens, F. L. Jr. 1985. dexamethasone and zinc in combination inhibit the anchorage-independent growth of s-91 cloudman murine melanoma. <i>Life Sciences</i> 36(9): 823-7 .
FL	Kreuzer, M. and Kirchgessner, M. effect of oral and intravenous iron on tissue retention and excretion of copper and zinc in growing rats. <i>J. Anim. Physiol. Anim. Nutr. (1994)</i> 72(4/5): 242-51.
Plant	Krewer, G., Ruter, J. M., NeSmith, D. S., Thomas, D., Sumner, P., Harrison, K., Westberry, G., Mullinix, B., Knox, D., <Editors> Yarborough, D. E., and Smagula, J. M. 1997. preliminary report on the effect of tire chips as a mulch and substratecomponent for blueberries. <i>Acta Horticulturae</i> (446): 309-318.
Nut def	Krieger, I., Alpern, B. E., and Cunnane, S. C. 1986. transient neonatal zinc-deficiency. <i>American Journal Of Clinical Nutrition</i> 43(6): 955-958.
Nut def	Krieger, I. and Statter, M. 1987. tryptophan deficiency and picolinic acid: effect on zinc metabolism and clinical manifestations of pellagra. <i>American Journal of Clinical Nutrition</i> 46(3): 511-7.
Nut def	Krieger, Ingeborg and Statter, Marian. 1987. tryptophan deficiency and picolinic acid: effect on zinc metabolism and clinical manifestations of pellagra. <i>Am. J. Clin. Nutr.</i> 46(3): 511-17 .
Bact	Krieger, J. N. and Rein, M. F. 1982. canine prostatic secretions kill trichomonas vaginalis. <i>Infection and Immunity</i> 37(1): 77-81.
Org Met	Krishnakumari, M. K., Bai, K. M., and Majumder, S. K. 1980. toxicity and rodenticidal potency of zinc phosphide. <i>Bulletin of Environmental Contamination and Toxicology</i> 25(1): 153-9.
Org Met	Krishnakumari, M. K., Bai, K. Muktha, and Majumder, S. K. evaluation of acute oral toxicity of zinc phosphide in rattus norvegicus (albino). <i>Pesticides (1979)</i> 13(11): 33-5
Org Met	Krishnakumari, M. K., Bai, Muktha K., and Majumder, S. K. toxicity and rodenticidal potency of zinc phosphide. <i>Bull. Environ. Contam. Toxicol. (1980)</i> 25(1): 153-9.
Org Met	Krishnakumari, M. K., Muktha Bai, K., and Majumder, S. K. 1979. evaluation of acute oral toxicity of zinc phosphide in rattus norvegicus (albino). <i>PESTICIDES</i> 13(11): 33-35.
No COC	Krishnakumari, M. K. Bai K. M. and Majumder S. K. 1980. toxicity and rodenticidal potency of zinc phosphide. <i>Bull.Environ.Contam.Toxicol.</i> 25: 153-159.
Phys	Kristal Bruce S(A), Koopmans Sietse J, Jackson Chris T, Ikeno Yuji, Park Bum-Jun, and Yu Byung P. 1997. oxidant-mediated repression of mitochondrial transcription in diabetic rats. <i>Free Radical Biology & Medicine</i> 22(5): 813-822.
FL	Kristiansen, P. H. 1973. (zinc metabolism in swine. v. the influence of zinc deficiency onprotein synthesis). <. <i>Document Title>Aarsberetning.</i> 75-80.
FL	Kristiansen, P. H. and Pedersen, I. H. 1972. (zinc metabolism in pigs. ii. changes in blood zinc

content in earlypost-natal life). <Document Title>Aarsberetning. 9-26.

- FL** Kristiansen, P. H., Pedersen, I. H., and Wegger, I. 1971. (zinc metabolism in pigs. i. assessment of zinc status in pigs by analysis of blood, hair and liver.). <Document Title>Aarsberetning. 111-126.
- FL** Krivtsov, I. L. and Kvitkin, Yu. P. 1978. effect of vitamins, amilo- and protosubtilina, zinc-bacitracin and aspirin on the physiological condition and productivity of broilers under high temperatures. *Sbornik Nauchnykh Trudov Vsesoyuznogo Nauchno-Issledovatel'Skogo i Tekhnologicheskogo Instituta Ptitsevodstva* (46): 66-71.
- FL** Krol, M. Yu. effect of intoxication with mercury on redistribution of copper, zinc and iron in animal organisms. *Veterinariya (Moscow)* (1998) (1): 51-55 .
- FL** Kroneman, J., Mey, G. J. W. v. d., and Helder, A. 1975. hereditary zinc deficiency in dutch friesland cattle. *Zentralblatt Fur Veterinarmedizin, A* 22(3): 201-208.
- FL** Krstic, R. 1972. [the influence of cold on zinc iodide-osmium tetroxide reactive synaptic vesicles in the pineal nerve endings of the rat]. <original> die einwirkung von kalte auf mit zinkjodid-osmium tetroxyd reagierende synaptische blaschen in den nervenendigungen im corpus pineale der ratte. *Zeitschrift Fur Anatomie Und Entwicklungsgeschichte* 135(3): 301-6.
- FL** Krstic, R. 1971. [ultrastructure of the rat kidney after fixation in osmium tetroxide]. <original> zur ultrastruktur der ratteniere nach fixation in osmium tetroxide. *Verhandlungen Der Anatomischen Gesellschaft* 65: 549-54.
- CP** Krueger, W. F., Benibo, B. S., and Bradley, J. W. the effect of bacitracin zinc and bacitracin md on the performance of commercial broilers. *73RD ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC. POULT SCI.* 63 (Suppl. 1). 1984. 131-132.
- FL** Krupinski, J. 1985. [the condition of the pulp and periapical periosteum after intravital amputation in dog molars and premolars]. <original> stan miazgi i ozebnej okolowierzcholkowej po amputacji przy.ang.zyciowej w zebach przedtrzonowych i trazonowych psow. *Czasopismo Stomatologiczne* 38(1): 13-22.
- Unrel** Kruse-Jarres, J. D. 1980. secretion in the b-cells of islets of langerhans as demonstrated by zinc staining. *Acta Diabetologica Latina* 17(2): 123-33.
- Unrel** Kruse-Jarres, J. D. secretion in the beta cells of langerhans as demonstrated by zinc staining. *Acta Diabetologica Latina*. 17 (2). 1980. 123-134.
- Phys** Kruse, M. N. and Poppele, R. E. components of the dynamic response of mammalian muscle spindles that originate in the sensory terminals. *Experimental Brain Research*. 86 (2). 1991. 359-366.
- Abstract** Krusemark, L. L. and Harmon, B. G. 1973. effect of dietary zinc on reproductive functions in boars. *Journal of Animal Science* 37(No.1): 284-285.
- FL** Krustev, E. and Konstantinov, P. 1971. (age and seasonal difference in the zn, cu and i content in pig's bloodserum and liver during embryonal and postnatal development.). *Veterinarnomeditsinski Nauki (Sofia)* 8(No.2): 65-71.
- FL** Krustev, F. 1974. (biochemical studies on pigs with parakeratosis). *Veterinarnomeditsinski Nauki, Bulgaria* 11(No.3): 16-21.

- Abstract** Ku, P. K., Bergen, W. G., Miller, E. R., and Ullrey, D. E. zinc deficiency and protein synthesis in the pig. *Journal of Animal Science*. 31 (1). 1970 206-207
- Abstract** Ku, P. K., Hill, G. M., Bebiak, D. M., Ullrey, D. E., and Miller, E. R. 1980. high dietary zn and dietary se utilization. *Journal of Animal Science* 51(Suppl. 1): 82.
- No COC** Kubena, K. S., Carpenter, Z. L., and Landmann, W. A. 1983. parturition and pregnancy outcome in rats as influenced by marginal intake of magnesium. *Nutrition Research* 3(4): 477-485.
- Nut def** Kubena, K. S., Landmann, W. A., Young, C. R., and Carpenter, Z. L. 1985. influence of magnesium deficiency and soy protein on magnesium and zinc status in rats. *Nutrition Research*. 5(3): 317-328.
- Nut def** Kubena, Karen S., Landmann, Wendell A., Young, Charles R., and Carpenter, Zerle L. influence of magnesium deficiency and soy protein on magnesium and zinc status in rats. *Nutr. Res. (N. Y.)* (1985) 5(3): 317-27.
- In Vit** Kubo, T., Ishii, Y., Yoshihara, K., Hirotsu, T., Hosokawa, J., and Suzuki, H. 1998. preparation of zinc-containing cell wall polysaccharide using rhizopus oryzae and its zinc utilization on growing rats. *Kichin Kitosan Kenkyu* 4(2): 162-163 .
- In Vit** Kubo, Takamasa, Kubokawa, Naohide, Yoshihara, Kazutoshi, Hosokawa, Jun, Hirotsu, Takahiro, and Suzuki, Hiroo. repression of zinc absorption inhibition of phytic acid in rats by chitinous polysaccharide from rhizopus acetoinus cell wall. *Nippon Nogei Kagaku Kaishi* (1998) 72(7): 825-833.
- No COC** Kubo, Takamasa, Yoshihara, Kazutoshi, Hosokawa, Jun, Suzuki, Hiroo, and Kubokawa, Naohide. 1996. preparation of chitosan containing cell wall from rhizopus acetorinus and its feeding effect on growing rats. *Kichin Kitosan Kenkyu* 2(2): 106-107.
- FL** Kubow, S., Bray, T. M., and Bettger, W. J. effects of dietary zinc and cooper on free radical production in rat lung and liver. *Canadian Journal of Physiology and Pharmacology*. 64 (10). 1986. 1281-1285.
- In Vit** Kubow, S. J. and Bettger, W. J. 1988. the mobility and reactivity of maleimide-binding proteins in the rat erythrocyte-membrane - effects of dietary zinc-deficiency and incubation with zinc invitro. *Canadian Journal Of Physiology And Pharmacology* 66(1): 66-71.
- FL** Kubow, Stan, Bray, Tammy M., and Bettger, William J. effects of dietary zinc and copper on free radical production in rat lung and liver. *Can. J. Physiol. Pharmacol.* (1986) 64(10): 1281-5.
- HHE** Kucera, J., Senft, V., Huzl, F., and Soukal, L. 1988. cadmium and zinc determination by neutron-activation analysis and biochemical tests in tissues of workers professionally exposed to cadmium. *Journal Of Radioanalytical And Nuclear Chemistry-Articles* 122(2): 361-372.
- FL** Kuchar, S., Koppel, J., Mozes, S., and Noskovic, P. 1987. regulation of milk intake in the young of ruminant animals. *Veterinarni Medicina* 32(4): 219-226.
- FL** Kuchin, A. S. 1985. the effect of the combined use of fenbendazole, trace elements and vitamins on parasitic infections in sheep. *Veterinarnaya Nauka - Proizvodstvu* 23: 96-100.
- Nut** Kuchtik, J., Chladek, G., Koutnik, V., and Hosek, M. 1999. effect of selenium and zinc supplementation on some parameters of meatperformance at semi-intensive fattening of lambs. *Czech Journal of Animal Science* 44(9): 415-421.

- Nut def** Kudo, Hideaki, Doi, Yoshiaki, Nishino, Tomoko, Nara, Soichiro, Hamasaki, Kunshige, and Fujimoto, Sunao. dietary zinc deficiency decreases glutathione s-transferase expression in the rat olfactory epithelium. *J. Nutr.* (2000) 130(1): 38-44.
- Nut def** Kudo, Naomi, Nakagawa, Yasuhito, and Waku, Keizo. the effect of cadmium on the composition and metabolism of hepatic fatty acids in zinc-adequate and zinc-deficient rats. *Toxicol. Lett.* (1990) 50(2-3): 203-12.
- Nut def** Kudo, Naomi, Nakagawa, Yasuhito, and Waku, Keizo. effects of zinc deficiency on the fatty acid composition and metabolism in rats fed a fat-free diet. *Biol. Trace Elem. Res.* (1990) 24(1): 49-60.
- Mix** Kudo, Naomi, Nakagawa, Yasuhito, Waku, Keizo, Kawashima, Yoichi, and Kozuka, Hiroshi. prevention by zinc of cadmium inhibition of stearoyl-coa desaturase in rat liver. *Toxicology* (1991) 68(2): 133-42.
- Gene** Kudo, T. and Sutou, S. 1997. molecular cloning of chicken ftz-f1-related orphan receptors. *Gene* 197(1-2): 261-8.
- FL** Kukral, H. W., Kirchessner, M., and Roth, H. P. 1986. <translated> activity of alpha-d-mannosidase in tissues of zinc-deficient rats. zur aktivitat der alpha-d-mannosidase in verschiedenen geweiben von ratten bei zinkmangel. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde = Journal Of Animal Physiology And Animal Nutrition.* 55(4/5): 272-278.
- FL** Kukral, H. W., Kirchgessner, M., and Roth, H. P. activity of .alpha.-d-mannosidase in various tissues of zinc-deficient rats. *J. Anim. Physiol. Anim. Nutr.* (1986) 55(4-5): 272-8.
- FL** Kukral, H. W., Kirchgessner, M., and Roth, H. P. 1988. [effect of marginal zinc deficiency on humoral immunity in rats]. <original> zum einfluss von marginalem zinkmangel auf die humorale immunitat der ratte. *Zeitschrift Fur Ernahrungswissenschaft* 27(2): 126-36.
- FL** Kukral, H. W., Kirchgessner, M., and Roth, H. P. effect of zinc deficiency in rats on lymphoid tissue, leukocytes, and other blood parameters (erythrocytes, hemoglobin, hematocrit, and mcv). *J. Anim. Physiol. Anim. Nutr.* (1989) 61(2/3): 85-92.
- FL** Kukral, H. W., Kirchgessner, M., and Roth, H. P. the effects of marginal zinc deficiency on humoral immunity in the rat. *Z. Ernaehrungswiss.* (1988) 27(2): 126-36.
- FL** Kukral, H. W., Kirchgessner, M., and Roth, H. P. 1989. humoral immunity in zinc-deficient rats. *Journal of Animal Physiology and Animal Nutrition* 61(2-3): 75-84.
- Nut def** Kul'kova, J., Bremner, I., McGaw, B. A., Reid, M., Beattie, J. H., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. mercury-zinc interactions in marginal zinc deficiency. 634-637.
- FL** Kulczycki, Antoni. 1985. toxicity of zinc phosphide and chlorphacinone to birds of economic importance, feeding on crops. *Acta Agrar. Silvestria Ser. Zootech.* 24: 69-82.
- Gene** Kulesa, H., Frampton, J., and Graf, T. 1995. gata-1 reprograms avian myelomonocytic cell lines into eosinophils, thromboblats, and erythroblats. *Genes & Development* 9(10): 1250-62.
- FL** Kulikov, N. E. and Morozova, K. N. calcium and phosphorus utilization from rations with varying zinc levels by growing rabbits. *Nauch. Tr. NII Pushn. Zverovod. i Krolikovod.* (1981) (25): 59-62 From: Ref. Zh., Zhivotnovod. Vet. 1982, Abstr. No. 1058569.

- Mix** Kulikowska, E., Moniuszko-Jakoniuk, J., and Miniuk, K. 1989. the effect of zinc on the toxic action of lead after administration of ethanol to rats. *Polish Journal of Pharmacology and Pharmacy* 41(3): 281-9.
- No COC** Kulikowska, Elzbieta, Moniuszko-Jakoniuk, Janina, and Miniuk, Kira. the effect of zinc on the toxic action of lead after administration of ethanol to rats. *Pol. J. Pharmacol. Pharm. (1989)* 41(3): 281-9.
- FL** Kulikowska-Karpinska, E., Wurm-Muszynska, R., Moniuszko-Jakoniuk, J., and Jurczuk, M. the effect of zinc on cadmium accumulation in selected tissues of experimental rats exposed to cadmium sulfate. *Bromatol. Chem. Toksykol. (1996)* 29(3): 237-241.
- Mineral** Kumagai, H., Ishida, N., and Kawashima, R. 1990. a study on the mineral status of breeding beef cows in western japan. *Nippon Sochi Gakkaishi = Journal of Japanese Society of Grassland Science* 36(2): 138-147.
- Mineral** Kumagai, H. Kyoto Univ. Japan Coll. of Agriculture, Ishida, N., Kawashima, R., Otsuki, K., Kawano, M., Hosoyamada, F., Inoue, R., and Kishida, Y. 1991. a study on the mineral status of prepartum and postpartum breeding beef cows and newborn calves, 2: copper and zinc. *Journal of Japanese Society of Grassland Science. V. 36(4) P. 444-451*
- Prim** Kumamaru, Takahiro, Riordan, James F., and Vallee, Bert L. determination of picogram quantities of zinc in zinc metalloproteins by atomic absorption spectrometry using a graphite furnace atomizer. *Anal. Biochem. (1982)* 126(1): 214-21.
- CP** Kumamoto Eiichi(A) and Murata Yuzo. 1993. n-methyl-d-aspartate-induced currents in rat cultured septal neurones. *Neuroscience Research Supplement* 0(18): S43.
- Drug** Kumar, A., Rao, M., and Kulkarni, D. R. zinc incorporation reverses suppressant effect of ibuprofen on wound healing. *Indian Journal of Experimental Biology.* 26 (6). 1988. 483-485.
- No COC** Kumar, P. Pasahan S. C. Sabhlok V. P. and Singal R. K. 1997. efficacy and economics of rodenticides for rodent management in watermelon (*citrullus lanatus*) fields. *Indian J.Agric.Sci.* 67(11): 528-530.
- CP** Kumar Rajiv, Haugen James D, Torres Vicente, Chini Eduardo N, and Dousa Thomas P. 1994. cysteine-rich intestinal peptide, a "zinc-finger" protein is expressed in the kidney of normal (+/+) and cystic (cy/cy) han: sprd rats. *Journal of the American Society of Nephrology* 5(3): 628.
- No Oral** Kumar, S., Singh, S., Mehta, D., Garg, R. R., Garg, M. L., Singh, N., Mangal, P. C., and Trehan, P. N. effect of automobile exhaust on the distribution of trace elements and its modulation following iron, copper and zinc supplementation. *Biol. Trace Elem. Res. (1991)* 31(1): 51-62.
- Nut** Kumar, V. and Kaur, H. 1987. zinc requirement of growing male kids. *International Journal of Animal Sciences* 2(2): 141-145.
- Nut def** Kumaresan, A., Durand, M., Dumay, C., and Beaumatin, P. National Center for Animal Production Research France. 1981. effects of feeding purified diet containing urea and zinc to sheep on rumen fermentation. *Journal of Animal Production Research. V. 1(1) P. 35-53*
- CP** Kumaresan, P. and Turner, C. W. 1967. effect of various hormones on mammary gland growth of ovariectomized rats. *Proceedings of the Society for Experimental Biology and Medicine*; 125
- Unrel** KUMARI, S. and PRAKASH, I. relative efficacy of male and female conspecific urine in masking shyness behavior in indian gerbil *tatera-indica*. *PROC INDIAN ACAD SCI ANIM SCI*;

93 (5). 1984 (RECD. 1985). 431-436.

- Unrel** Kumari, S. and Prakash, I. role of conspecific urine in enhancing food consumption and masking of shyness behavior in the desert gerbil *Meriones-hurrianae*. *Indian Journal of Experimental Biology*. 18 (7). 1980. 730-732.
- Bio Acc** Kume, S., Mukai, A., and Shibata, M. 1984. effect of zinc level in rations on zinc concentration in liver and kidney of holstein cattle. *Japanese Journal of Zootechnical Science* 55(3): 183-190.
- OAC** Kume, S A, Toharmat, T., and Kobayashi, N. 1998. effect of restricted feed intake of dams and heat stress on mineral status of newborn calves. *Journal of Dairy Science* 81(6): 1581-1590.
- Meth** Kundu, Tapas Kumar and Rao, Manchanahalli R Satyanarayana A. 1994. characterization of the zinc-metalloprotein nature of rat spermatidal protein tp2. *FEBS Letters* 351(1): 6-10.
- Gene** Kundu Tapas Kumar and Rao Manchanahalli R Satyanarayana(A). 1995. dna condensation by the rat spermatidal protein tp2 shows gc-rich sequence preference and is zinc dependent. *Biochemistry* 34(15): 5143-5150.
- FL** Kundzinia, R. S., Komnova, Z. D., and Volozhin, A. I. 1993. [the periodontal reaction to root canal obturation with different filling materials]. <original> reaktsiia periodonta na zapolnenie kornevogo kanala raznymi plombirovochnymi materialami. *Stomatologiia* 72(1): 4-7.
- Meth** Kunugiyama Iwao(A), Ito Nobuhiko(A), Kato Sumie(A), Furukawa Yoshinori= (A), Mitani Noriko, Futatsugawa Syoji, and Sera Kouichiro. 1994. determination of selenium and zinc in hair and serum of companion animals by pixe method. *Radioisotopes* 43(11): 665-672.
- No COC** Kuo, C. T., Veselits, M. L., Barton, K. P., Lu, M. M., Clendenin, C., and Leiden, J. M. 1997. the Ik1f transcription factor is required for normal tunica media formation and blood vessel stabilization during murine embryogenesis. *Genes & Development* 11(22): 2996-3006.
- IMM** Kuo Chay Tl(A), Leiden Jeffrey M(A), and <Book> Paul W E: Ed. 1999. transcriptional regulation of t lymphocyte development and function. <book> annual review of immunology. *Annual Review of Immunology* 17: 149-187.
- Fate** Kurasaki, Masaaki, Okabe, Masashi, Saito, Shigeru, and Suzuki-Kurasaki, Mika. copper metabolism in the kidney of rats administered copper and copper-metallothionein. *Am. J. Physiol.* (1998) 274(4, Pt. 2): F783-F790.
- FL** Kurashvili B E, Fidler Z N, Karachentzeva Y M, Nikolaishvili K G, Lomidze T V, Melashvili N O, and Medvedeva J J. 1989. study of possibility of vole organism (*Microtus socialis pallas*, 1773) to reiterated effects of zinc phosphide. *EKOLOGIYA* 126(MOSCOW): 88-91, illustr.
- Unrel** Kurashvili, B. E., Fidler, Zh. N., and Karachentseva, Yu. M. effect of a day-long exposure on the effectiveness of grain bait containing zinc phosphide and activated with pheromones. *Soobshch. Akad. Nauk Gruz. SSR* (1989) 133(1): 173-5.
- FL** Kurashvili B E and Lomidze T V. 1989. the study of zinc phosphide effect on the activity of brain acetylcholinesterase of *Microtus socialis*. *SOOBSHCHENIYA AKADEMII NAUK GRUZINSKOI SSR* 134. 126(1): 189-192, illustr.
- Drug** Kurimoto, T., Matsumura, T., Furuichi, H., Hiraga, Y., Nakata, N., Izumi, J., Nishi, N., Mori, T., Kamatsuka, Y., and Tagashira, E. general pharmacology of catena-s-mu-n-a-3-aminopropionylhistidinato-2-n-1 n-2 o n-tau-zinc z-103 1. central nervous system.

Pharmacometrics. 42 (1). 1991. 61-68.

- FL** Kurtogu, S., Patiroglu, T. E., and Karakas, S. E. effect of growth hormone on epiphyseal growth plates in zinc deficiency. *Tokai Journal of Experimental and Clinical Medicine.* 12 (5-6). 1987. 325-330.
- FL** Kutlik, I. E. 1972. [possibilities for the demonstration of urobilinoids in tissues]. <original> uber die moglichkeiten eines nachweises von urobilinoiden in den gewebe. *Acta Histochemica* 42(2): 302-15.
- Abstract** KUWAYAMA, H., EASTWOOD, G., TANAKA, N., TASHIRO, Y., and MATUO, Y. 1988. effect of z-103 n-13 aminopropionyl-l-histidine zinc against ethanol injury and on epithelial proliferation in rat stomach. *89TH ANNUAL MEETING OF THE AMERICAN GASTROENTEROLOGICAL ASSOCIATION*
- Alt** Kuz'menko, E. A. growth of accessory organs and sexual members of castrated and semicastrated rats administered zinc sulfate during immature growth. *Endokrinologiya* (1982) : 12, 42-5 .
- Mix** Kuznetsov, S. G., Kharitonova, O. V., and Kal'nitskii, B. D. effect of copper and zinc additives in rations of milk cows on productivity and reproductive function. *Sel'Skokhozyaistvennaya Biologiya.* 17 (5). 1982. 692-696.
- Fate** Kuznetsova, T. V. and Burykina, L. N. 1972. passage of 65zn to the progeny in a long-term experiment. *Gigiena Truda i Professional'Nye Zabolevaniya* 16(1): 36-39.
- FL** Kuznetsova, T. V. and Burykina, L. N. zinc-65 passage to the progeny in a chronic experiment. *Gig. Tr. Prof. Zabol. (1972)* 16(1): 36-9.
- Nut** Kvitkin, Yu. P., Egorov, I. A., Kureneva, V. P., and Makshantseva, G. A. 1983. effectiveness of using unpurified compounds of trace elements in premixes and mixed feeds for broilers. *Nov. Sel. Korml. Profil. Zabol. S-Kh. Ptitsy* : 47-55. Editor(s): Fisinin, V. I. Publisher: Vses. Nauchno-Issled. Tekhnol. Inst. Ptitsevod., Zagorsk, USSR..
- FL** Kwapinska, H. 1991. [macroscopic and microscopic observations of zinc distribution in hard tissues of the mouth in white rats]. <original> makroskopowa i mikroskopowa ocena rozmieszczenia cynku w twardych tkankach narzadu .ang.zucia szczura bialego. *Folia Medica Cracoviensia* 32(3-4): 299-308.
- FL** Kwast, M. 1980. effect of amount of protein in the feed on values for metallothioneinin the liver of rats. *Roczniki Panstwowego Zakladu Higieny* 31(6): 561-566.
- FL** Kwast, M. 1980. [effect of protein level in the feed on metallothionein content in rat liver]. <original> wplyw poziomu bialka w paszy na zawartosc metalotioneiny w watrobie szczurow. *Roczniki Panstwowego Zakladu Higieny* 31(6): 561-6.
- CP** Kwiatek, W. M., Long, G. J., Pounds, J. G., Reuhl, K. R., and Hanson, A. L. 1989 .*Trace Element Distribution in the Rat Cerebellum.* BNL-43097; CONF-8908165-2
- CP** Kwik-Urbe, C. L., German, J. B., and Keen, C. L. 1999. marginal zinc deficiency and neonatal brain fatty acid composition. *FASEB Journal* 13(4 PART 1): A579.
- Diss** Kwun, In-Sook. 1995. effect of phytate added to a casein-based diet on endogenous zinc and study of pancreatic/biliary fluid fractions in rats. *Avail.: Univ. Microfilms Int. Order No.: DA9529797 From: Diss. Abstr. Int., B 1995, 56. 5. 211 pp.*

- Food** Kwun, In-Sook and Oberleas, Donald. estimation of the endogenous pancreatic/biliary zinc pool and the effect of phytate and calcium on zinc homeostasis. *J. Food Sci. Nutr.* (1997) 2(1): 35-41.
- No Oral** Kwun, In-Sook and Oberleas, Donald. identification and molecular size of zinc-binding ligands in pancreatic/biliary fluid of rats. *J. Food Sci. Nutr.* (1997) 2(1): 42-48.
- No Oral** Kwun, In-Sook and Oberleas, Donald. molecular size and distribution of zinc-binding ligands in rat pancreatic tissue. *J. Food Sci. Nutr.* (1997) 2(3): 219-224
- Rev** Kynast, G. and Saling, E. 1980. the relevance of zinc in pregnancy. *Journal of Perinatal Medicine* 8(4): 171-82.
- No COC** Kyriakis, S. C., Tsinas, A., Lekkas, S., Sarris, K., and Bourtzi-Hatzopoulou, E. 1996. clinical evaluation of in-feed zinc bacitracin for the control of porcine intestinal adenomatosis in growing/fattening pigs. *Veterinary Record* 138(20): 489-492.
- Mix** L'Abbe, M. R. and Fischer, P. W. F. 1984. the effects of dietary zinc on the activity of copper-requiring metalloenzymes in the rat (ceruloplasmin, superoxide dismutase, cytochrome c oxidase). *The Journal Of Nutrition.* 114 (5): 823-828.
- Nut def** L'Abbe, M. R. and Fischer, P. W. F. 1984. the effects of high dietary zinc and copper deficiency on the activity of copper-requiring metalloenzymes in the growing rat (ceruloplasmin, superoxide dismutase, cytochrome c oxidase). *The Journal Of Nutrition.* 114 (5): 813-822.
- CP** Laakso, J. and Michelsson, J. E. effects of immobilization on muscle element homeostasis. *THIRD INTERNATIONAL CONFERENCE OF THE INTERNATIONAL SOCIETY OF TRACE ELEMENT RESEARCH IN HUMANS (ISTERH), STOCKHOLM, SWEDEN, MAY 25-29, 1992. J TRACE ELEM EXP MED.* 5 (2). 1992. 121.
- Unrel** Labatut-Cazabat Isabelle(A), Vekris Antoine, and Petry Klaus G. 1999. a protein with the characters of a zinc-finger is implicated in the differentiation of schwann cells. *Neuroreport* 10(14): 3037-3043.
- Rev** Labbe, R. F. and Rettmer, R. L. 1989. zinc protoporphyrin - a product of iron-deficient erythropoiesis. *Seminars In Hematology* 26(1): 40-46.
- Nut** Lachowski, A., Kuczynska, I., Gehrke, M., <Editors> Gediga, K., and Ciesla, G. 1996. concentration of some major and trace elements in blood serum of cows fed on whole barley silage. *Zeszyty Problemowe Postepow Nauk Rolniczych* 434(II): 741-745.
- Unrel** Lacord-Bonneau, M., Picard, J., and Dubernard, L. 1975. influence of vitamin a on the distribution of glycosaminoglycans in the tissues of the rat. *Nutrition and Metabolism* 18(5/6): 225-239.
- FL** Laczay, P., Simon, F. Allatorvostudományi Egyetem Budapest Hungary Gyógyszertani Tanszék, and Voros, G. Allattenyesztési és Takarmányozási Kutatóközpont Godollo Hungary. 1987. dose-dependent growth promoting effect of zinc-bacitracin in broilers. <original> a cinkbacitracin hozamfokozó hatása a dózis függvényében broilercsikre. *Magyar Allatorvosok Lapja.* V. 42(3) P. 181-184
- Chem Meth** Ladanyi, Erna. polarographic determination of copper, zinc, and lead in water. *Igiena* (1968) 17(12):
- HHE** Ladefoged, K. and Jarnum, S. 1983. zinc-deficiency syndrome during parenteral-nutrition in

humans. *Metal Ions In Biological Systems* 15: 415-438.

- Nut** Ladeji, O., Okoye, Zebulon S. C., and Waidu, Zakaria. effect of supplementation of laboratory chow with leaves of rumex acetosa (sorrel) on body weight and serum levels of amino acids and minerals in rats. *Food Chem.* (1997) 59(1): 15-17.
- FL** Ladetto, G., Gallo, M. L., and Ariotti Marchisio, P. 1973. [hydroxyproline content of pectoral muscles in chickens fed on a diet integrated with some antibiotics/chlorotetracycline, zinc-bacitracine, flavomycin/]. <original> il contenuto di idrossiprolina nei muscoli pettorali di polli sottoposti a dieta integrata con alcuni antibiotici (clorotetraciclina, zinco-bacitracina, flavomicina). *Annali Della Facolta Di Medicina Veterinaria. Turin.* V. 20 P. 263-275
- FL** Ladetto, G. Turin Univ. Italy Istituto di Scienze degli Allevamenti e Controllo dei Prodotti di Origine Animale, Berta, F., and Cava, P. L. 1983. the use of zinc-bacitracin as a growth promoter in growing rabbits diets. <original> l'impiego della zincobacitracina in qualita' di auxinico nelle diete dei conigli in accrescimento. *Annali Della Facolta Di Medicina Veterinaria Di Torino.* V. 29 P. 80-89
- No COC** Laerdal, A. A. Apothekernes Laboratorium Norway Services Techniques. 1980. [laying hens rearing: the use of zinc-bacitracin in poultry feeds. technico-economical interest [france, eec; antibiotics, feed additives]]. <original> l'elevage de la poule pondeuse: l'utilisation de la bacitracine-zinc pour les pondeuses. interet technique et economique [france, cee; antibiotiques, additifs alimentaires]. *Courrier Avicole.* V. 36(776) P. 23-24
- Invert** Lafleur, G., Hill, S. B., and Vincent, C. fall migration hibernation site selection and associated winter mortality of plum curculio coleoptera curculionidae in a quebec apple orchard. *Journal of Economic Entomology.* 80 (6). 1987. 1152-1172.
- No Dose** LAGUNOWICH, L. A., STEIN, A. P., and REUHL, K. R. 1994. n-cadherin in normal and abnormal brain development. *NEUROTOXICOLOGY (LITTLE ROCK);* 15 (1): 123-132.
- No Dose** Lai, James C. K., Minski, Margaret J. , Chan, Alex W. K., Leung, Thomas K. C., and Lim, Louis. manganese mineral interactions in brain. *Neurotoxicology* (1999) 20(2-3): 433-444.
- Gene** Lai Wi S, Thompson Michael J, and Blackshear Perry J(A). 1998. characteristics of the intron involvement in the mitogen-induced expression of zfp-36. *Journal of Biological Chemistry* 273(1): 506-517.
- FL** Lai, Yuyong, Wu, Wei, Chen, Hong, Wang, Zhangjin, Liao, Luxin, and Huang, Xiaoyong. the influences on rat liver and kidney functions with combined se and cd treatment. *Weisheng Dulixue Zazhi* (1998) 12(1): 28-30.
- HHE** Laitinen, R., Vuori, E., Dahlstrom, S., and Akerblom, H. K. 1989. zinc, copper, and growth status in children and adolescents. *Pediatric Research* 25(4): 323-326.
- Fate** Laitnerova, N. 1981. the effect of dietary zinc content on intestinal absorption and distribution of 65zn in organs of rats. *Acta Universitatis Agriculturae Brno, Facultas Agronomica* 29(1/2): 313-317.
- FL** Laitnerova, N. 1978. effect of different amounts of zinc in the diet on concentration of zinc in the organs of rats. *Acta Universitatis Agriculturae Brno, Facultas Agronomica* 26(4): 161-167.
- FL** Laitnerova, N. <translated> effect of different zinc levels in the diet upon its concentration in rat organs. vliv ruzne hladiny zinku v krmne davce na koncentraci zinku v organech krys. *Sbornik. ; Rada A. ; Spisy Fakulty Agronomicke.Brno. ; Vysoka Skola Zemedelska.* 1979. v. 26 (4) p. 161-

167. ill.

- FL** Laitnerova, N. Vysoka Skola Zemedelska Brno Czechoslovakia Anatomie Fyziologie Hospodarskych Zvirat a Biochemie. the effect of different zinc levels in the diet on its concentration rat organs. <original> vliv ruzne hladiny zinku v krmne davce na koncentraci zinku v organech krys. *Acta Universitatis Agriculturae. Ser.A. Facultas Agronomica. Brno* PY-
- Nut def** Laitnerova, Nadezda. 1978. effect of different zinc levels in the diet on its concentration in rat organs. *Acta Univ. Agric. Fac. Agron. Brno* 26(4): 161-7.
- Unrel** Lalazar, A., Wong, L., Yamasaki, G., and Friedman, S. L. 19970800. early genes induced in hepatic stellate cells during wound healing. *Vol. 195, No. 2, Pp. 235-243* Gene
- Nut** Lall D(A), Arora U(A), and Chauhan, T. R(A). 1999. mineral status in buffalo calves fed on deoiled rice bran based ration. *Indian Journal of Animal Nutrition* 16(3): 215-219.
- No COC** Lam, Y. M. 1990. evaluation of four rodenticidal dust for the control of rattus argentiventer in rice fields. *MARDI (Malays.Agric.Res.Dev.Inst.)Res.J.* 18(2): 185-189.
- Nut def** Lamand, C. Institut National de la Recherche Agronomique Ceyrat France Centre de Theix Laboratoire des Maladies Nutritionnelles, Lab, C., Mignon, M., and Tressol, J. C. 1984. development of a zinc-deficient diet for ruminants. diagnosis and treatment of the deficiency. <original> mise au point d'un regime carence en zinc pour les ruminants. diagnostic et traitement de la carence. *Annales De Biologie Clinique. V. 42(2) P. 155*
- Nut def** Lamand, C. Institut National de la Recherche Agronomique Ceyrat France Centre de Theix Laboratoire des Maladies Nutritionnelles, Lab, C., Mignon, M., and Tressol, J. C. 1984. influence of protein level on zinc deficiency in the lamb. <original> influence du niveau proteique sur la carence en zinc chez l'agneau. *Annales De Biologie Clinique. V. 42(2) P. 159*
- Nut def** Lamand, M. influence of protein intake on oral zinc deficiency treatment in sheep. *ANN RECH VET. Annales De Recherches Veterinaires. 16 (3). 1985. 285-288.*
- Nut def** Lamand, M. 1985. influence of protein intake on per os zinc deficiency treatment insheep. *Annales De Recherches Veterinaires* 16(3): 285-287.
- Nut def** Lamand, M. 1986. utilization by sheep of zinc in forage-based diets low in protein. *Bulletin Technique, Centre De Recherches Zootechniques Et Veterinaires De Theix* (64): 5-8.
- Nut def** Lamand, M., Lab, C., Mignon, M., and Tressol, J. C. 1988. interference of sulphur and molybdenum with the metabolism of copperand zinc in lambs. *Reproduction, Nutrition, Developpement* 28(1): 201-202.
- Nut def** Lamand, M., Lab, C., Mignon, M., and Tressol, J. C. 1983. a zinc-deficient diet for ruminants: diagnosis and treatment of deficiency. *Annales De Recherches Veterinaires* 14(3): 211-215.
- FL** Lamand, M. Institut National de la Recherche Agronomique Ceyrat France Centre de Clermont Ferrand Theix Laboratoire des Maladies Nutritionnelles et Immunologie des Ruminants, Lab, C., Mignon, M., and Tressol, J. C. 1990. the influence of sulfur supplementation (methionine and sulfate) on the zinc availability of a poor diet in sheep. <original> influence de la supplementation en soufre (methionine et sulfate) sur la digestibilite du zinc d'une ration pauvre chez le mouton. *Annales De Recherches Veterinaires. V. 21(3) P. 229-230*
- HHE** Lamar-Hildebrand, N., Saldanha, L., and Endres, J. 1989. dietary and exercise practices of college-aged female bodybuilders. *Journal of the American Dietetic Association* 89(9): 1308-

1310.

- Gene** Lambert, P. D., Ely, T. D., Gross, R. E., and Kilts, C. D. 1996. neurotensin induces fos and zif268 expression in limbic nuclei of the rat brain. *Neuroscience* 75(4): 1141-51.
- No COC** Lambio, A. L., Arboleda, C. R., and Bravo, M. V. A. 1975. evaluation of three antibiotic feed additives on broiler performance. *Philippine Agriculturist* 59(3/4): 51-59.
- Prim** Lamers, A. C., Simon, M., and van Mullem, P. J. 1980. microleakage of cavit temporary filling material in endodontic access cavities in monkey teeth. *Oral Surgery, Oral Medicine, and Oral Pathology* 49(6): 541-3.
- No COC** Lamproglou, I., Magdelenat, H., Boissierie, G., Baillet, F., Mayo, W., Fessi, H., Puisieux, F., Perderau, B., Colas Linhart, N., and Delattre, J. Y. 1998. an experimental model of acute encephalopathy after total body irradiation in the rat: effect of liposome-entrapped cu/zn superoxide dismutase. *Vol. 42, No. 1, Pp. 179-184 International Journal Of Radiation Oncology, Biology, & Physics*
- In Vit** Land, P. W A and Akhtar, N. D. 1999. experience-dependent alteration of synaptic zinc in rat somatosensory barrel cortex. *Somatosensory & Motor Research* 16(2): 139-150.
- No Oral** LANDAUER, W. rumplessness of chicken embryos produced by the injection of insulin and other chemicals. *J EXP ZOOL* 98:65-77,1945
- No COC** Landes, D. R. influence of dietary carbohydrate on copper, iron, and zinc status of the rat. *Proc. Soc. Exp. Biol. Med. (1975)* 150(3): 686-9 .
- No COC** Landick, R. and Roberts, J. W. 1996. the shrewd grasp of rna polymerase. *Vol. 273, No. 5272, Pp. 202-203 Science (Wash.)*
- No Oral** Langard, S. and Nordhagen A. L. 1980. small animal inhalation chambers and the significance of dust ingestion from the contaminated coat when exposing rats to zinc chromate. *Acta Pharmacol.Toxicol.* 46: 43-46.
- Anat** Lange, R. H., Bloedorn, J., Magdowski, G., and Trampisch, H. J. crystalline preparations of rhombohedral porcine insulin as studied by electron diffraction. *Journal of Ultrastructure Research.* 68 (1). 1979. 81-91.
- Drug** Langer, R. 1996. controlled release of a therapeutic protein. *Vol. 2, No. 7, Pp. 742-743 Nat. Med.*
- Phys** Langford Paul R, Loynds Barbara M, and Kroll, J. Simon(A). 1996. cloning and molecular characterization of cu,zn superoxide dismutase from actinobacillus pleuropneumoniae. *Infection and Immunity* 64(12): 5035-5041.
- Nut** Langley, Simon C., Seakins, Marian, Grimble, Robert F., and Jackson, Alan A. the acute phase response of adult rats is altered by in utero exposure to maternal low protein diets. *J. Nutr.* (1994) 124(9): 1588-96 .
- Food** Lansdown, A. B. G. interspecies variations in response to topical application of selected zinc compounds. *Food Chem. Toxicol. (1991)* 29(1): 57-64.
- Unrel** LANSDOWN, A. BG and TAYLOR, A. zinc and titanium oxides: promising uv-absorbers but what influence do they have on the intact skin? *INTERNATIONAL JOURNAL OF COSMETIC SCIENCE; 19 (4). 1997. 167-172.*

- Drug** Lantz, B. and Persson, P. A. 1967. periodontal tissue reactions after root perforations in dog's teeth. a histologic study. *Odontologisk Tidskrift* 75(3): 209-37.
- Drug** Lantz, B. and Persson, P. A. 1970. periodontal tissue reactions after surgical treatment of root perforations in dogs' teeth. a histologic study. *Odontologisk Revy* 21(1): 51-62.
- FL** Lantzs, H.-J. 1973. (dietary zinc and its toxicity). *Ubersichten Zur Tierernahrung* 1(Heft 1): 57-88.
- FL** Lantzs, H. J. and Berschauer, F. 1983. influence of zinc status on postprandial plasma zinc changes in pigs. *Annals of Nutrition and Metabolism* 27(3): 228-232.
- FL** Lantzs, H. J. and Berschauer, F. 1982. postprandial plasma zinc changes in pigs. *Annals of Nutrition and Metabolism* 26(3): 178-185.
- FL** Lantzs, H. J. and Menke, K. H. 1973. assessment of the zinc status with the aid of chelating agents. 1. effect of parenteral doses of ca-na₂-edta on some criteria of zinc metabolism. *Zeitschrift Fur Tierphysiologie Tierernahrung Und Futtermittelkunde* 32(3): 129-143.
- FL** Lantzs, H. J. and Menke, K. H. 1973. characterization of the zinc nutrition status using chelating agents. i. effect of parenteral doses of the calcium-disodium salt of edta on some criteria of zinc metabolism. *Z. Tierphysiol. Tierernaehr. Futtermittelk.* 32(3): 129-43.
- FL** Lantzs, H. J. and Menke, K. H. 1974. [determination of intestinal secretion and absorption of zinc in the growing rat]. <original> zur bestimmung der intestinalen sekretion und absorption von zink bei der wachsenden ratte. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde*;
- FL** Lantzs, H. J. and Menke, K. H. 1974. effect of flavomycin (r) in fattening broilers. *Archiv Fur Geflugelkunde* 38(3): 82-85.
- CP** Lantzs, H. J. and Menke, K. H. 1974. effect of parenterally administered edta on endogenous secretion and metabolism of zinc in the rat. *Trace Elem. Metab. Anim. Proc. Int. Symp., 2nd* : Meeting Date 1973, 530-3. Editor(s): Hoekstra, W. G. Publisher: Univ. Park Press, Baltimore, Md.
- FL** Lantzs, H. J. and Menke, K. H. 1974. estimation of intestinal secretion and absorption of zinc in the growing rat. *Zeitschrift Fur Tierphysiologie Tierernahrung Und Futtermittelkunde* 34(1): 43-49.
- FL** Lantzs H-J and Menke, K. H. the use of chelating agents for characterization of the zinc nutrition state part 1 the effect of parenteral calcium di sodium edta applications on several criteria of zinc metabolism. *Zeitschrift Fuer Tierphysiologie Tierernaehrung Und Futtermittelkunde.* 32 (3). 1973 (Recd 1974) 129-143.
- FL** Lantzs, H. J., Schenkel, H., and Menke, K. H. 1977. studies on the characteristics of zinc maintenance status by chelate constituents. 2. relation between zinc supply, zinc retention, and zinc urinary excretion after an intraperitoneal injection of edta in the rat. *Z. Tierphysiol. Tierernaehr. Futtermittelkd.* 38(2): 106-18.
- FL** Lantzs, H. J., Schenkel, H., and Nickerl, Ingrid. studies on the determination of zinc availability. *Uebers. Tierernaehr.* (1979) 7(2): 185-8.
- FL** Lantzs, H. J. and Scheuermann, S. E. 1984. effect of body zinc content on the reaction of various parameters of zinc metabolism. 2. apparent absorption, urinary excretion and body

retention of zinc . *Z. Tierphysiol. Tierernaehr. Futtermittelkd.* 51(1-2): 98-106.

- FL** Lantzs H-J and Scheuermann, S. E. influence of body zinc content on the reaction of various parameters of zinc metabolism 2. apparent absorption urinary excretion and body retention of zinc. *Zeitschrift Fuer Tierphysiologie Tierernaehrung Und Futtermittelkunde.* 51 (1-2). 1984 (Recd. 1985). 98-106.
- FL** Lantzs H. J. and Scheuermann, S. E. 1984. relation of different indices of zinc metabolism to initial zn status.2. apparent absorption, urinary excretion and retention of zn. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde* 51(1-2): 98-106.
- FL** Lantzs H. J., Scheuermann, S. E., and Menke, K. H. 1988. gastrointestinal hydrolysis of phytate from wheat, barley and maize in young pigs. *Journal of Animal Physiology and Animal Nutrition* 59(5): 273-284.
- FL** Lantzs H. J., Scheuermann, S. E., and Menke, K. H. 1988. influence of various phytate sources on the p, ca and zn metabolism of young pigs at different dietary zn levels. *Journal of Animal Physiology and Animal Nutrition* 60(3): 146-157.
- Plant** Lapa, V. V., Limantova, E. M., and Bosak, V. N. 1993. quality of winter wheat following combined use of nitrogen fertilizer, trace elements, and growth regulators. *Vestsi Akad. Agrar. Navuk Belarusi* (2): 30-34 .
- Phys** Lapin, V. I., Korchin, V. I., Meiramov, G. G., Pal'mina, T. V., and Satosin, V. F. 1973. effect of alloxan on the level of insulin and zinc in the pancreatic islets of hamsters , rats , mice , and guinea pigs. *Patol. Fiziol. Eksp. Ter.* (4): 36-40 .
- FL** Lapinska, K. and Lapinski, H. a case of parakeratosis in piglets. *Medycyna Weterynaryjna.* 28 (11). 1972 (Recd 1973) 694.
- Mix** Laredo, M. A., Gonzalez, F., Carrillo, J. A., and McDowell, L. R. mineral supplementation of beef cattle in an andean region of colombia. *Nutrition Reports International.* 39 (5). 1989. 1069-1080.
- CP** Larsen, T. and Eggum, B. O. 1991. the influence of calcium, copper and zinc content of a rapeseed diet on growth and organ deposition in rats. *Trace Elem. Man Anim. 7: Monogr. Proc., Round Tables Discuss. Int. Symp., 7th* : Meeting Date 1990, 25-7-25/8. Editor(s): Momcilovic, Berislav. Publisher: Inst. Med. Res. Occup. Health Univ. Zagreb, Zagreb, Yugoslavia..
- Mineral** Larsen, Torben and Sandstrom, Brittmarie. effect of calcium, copper, and zinc levels in a rapeseed meal diet on mineral and trace element utilization in the rat. *Biol. Trace Elem. Res.* (1992) 35(2): 167-84.
- Mineral** Larsen, Torben and Sandstrom, Brittmarie. tissues and organs as indicators of intestinal absorption of minerals and trace elements, evaluated in rats. *Biol. Trace Elem. Res.* (1992) 35(2): 185-99.
- No Oral** Larson, Alice A. and Kitto, Kelley F. chelation of zinc in the extracellular area of the spinal cord, using ethylenediaminetetraacetic acid disodium-calcium salt or dipicolinic acid, inhibits the antinociceptive effect of capsaicin in adult mice. *J. Pharmacol. Exp. Ther.* (1999) 288(2): 759-765.
- No COC** LARSSON, K. S., ARNANDER, C., CEKANOVA, E., and KJELLBERG, M. studies of teratogenic effects of the dithiocarbamates maneb, mancozeb and propineb. *TERATOLOGY*

- FL** Larue, C. 1975. [comparison of the effects of anosmia induced by either peripheral lesion or bulbectomy upon the feeding pattern of the rat (author's transl)]. <original> comparaison des effets de l'anosmie peripherique et de la bulbectomie sur la sequence alimentaire du rat. *Journal De Physiologie* 70(3): 299-306.
- Aquatic** Lasenby, D. C. and Van Duyn, J. zinc and cadmium accumulation by the opossum shrimp *mysis relicta*. *Arch. Environ. Contam. Toxicol.* (1992) 23(2): 179-83 .
- No Control** Lastra, M. A. Dolores, Pastelin, Rodolfo, Herrera, Monica A., Orihuela, Victor D., and Aguilar, Ana E. increment of immune responses in mice perinatal stages after zinc supplementation. *Arch. Med. Res.* (1997) 28(1): 67-72 .
- CP** Lastra, M. D., Pastelin, R., Camacho, A., Saldivar, L., Aguilar, A. E., and <Book> 9th International Congress Of Immunology. 1995. zn mitogenic action of lymphocyte proliferation of mice in perinatal stages. <book> the 9th international congress of immunology. 588.
- Mix** Lata, S. and Mehta, U. 1989. lipid content in rat organs: the effect of different dietary zinc copper ratios. *Indian Journal of Nutrition and Dietetics* 26(6): 161-170.
- No COC** Latour, B. and Barnum, D. A. use of ducks as a model to study the effect of antibiotics in feed on the fecal shedding of salmonella. *American Journal of Veterinary Research.* 42 (12). 1981 (Recd. 1982). 2105-2108.
- IMM** Latshaw, J. D. 1991. nutrition--mechanisms of immunosuppression. *Veterinary Immunology and Immunopathology* 30(1): 111-20.
- Phys** Latunde-Dada, G. O. 1991. the effects of sugar-beet fibre and wheat bran on iron and zinc absorption in rats [letter; comment]. *British Journal of Nutrition* 65(3): 505-6.
- FL** Latyshev, V. I., Ogarenko, N. B., Rudenko, G. Ya., and Strugovshchikov, V. R. 1988. effect of a complex of metals on some indicators of protein and energymetabolism in chickens. <Document Title>3 Vsesoyuznoe Soveshchenie Po Khimii i Primeneniyukompleksonov i Kompleksonatov Metodov. Tezisy Dokladov. 256-257.
- Alt** Lau, A. L. JONUA and Failla, M. L. 1984. urinary excretion of zinc, copper and iron in the streptozotocin-diabetic rat . *The Journal Of Nutrition.* 114 (1): 224-233.
- Nut def** Lau, B. W. C. and Klevay, L. M. 1981. plasma lecithin:cholesterol acyltransferase in copper-deficient rats. *Journal of Nutrition* 111(10): 1698-1703.
- Alt** Lau, John C. and Cherian, M. George. developmental changes in hepatic metallothionein, zinc, and copper levels in genetically altered mice. *Biochem. Cell Biol.* (1998) 76(4): 615-623.
- Abstract** Lau, John C. University of Western Ontario London Ontario Canada, Joseph, Mariamma G., and Cherian, M. George. role of placental metallothionein in maternal to fetal transfer of. *Toxicol.* V127, N1-3, P167(12)
- BioX** Laubach, H. E. 1990. effect of dietary zinc on larval burdens, tissue eosinophil numbers, and lysophospholipase activity of ascaris suum infected mice. *Acta Tropica* 47(4): 205-11.
- HHE** Laube Bodo, Kuhse Jochen, Rundstrom Nils, Kirsch Joachim, Schmieden Volker, and Betz Heinrich(A). 1995. modulation by zinc ions of native rat and recombinant human inhibitory glycine receptors. *Journal of Physiology (Cambridge)* 483(3): 613-619.

- No COC** Laurant, P., Droz-Bartholet, C., and Berthelot, A. effect of a long-term high magnesium intake on metabolism of zinc in sprague dawley male rats. *Trace Elem. Med.* (1991) 8(2): 70-3 .
- CP** Laurant, Pascal and Berthelot, Alain. influence of magnesium diets on blood pressure and zinc metabolism in mineralocorticoid-salt hypertensive rats. *Health Dis. [Proc. Int. Symp. Magnesium Trace Elem.]* (1993) : Meeting Date 1991, 63-9. Editor(s): Nath, R.; Gill, K. D. Publisher: Ashish Publ. House, New Delhi, India.
- No Oral** Laurincik, J., Hyttel, P., Rath, D., and Pivko, J. 1994. ovulation, fertilization and pronucleus development in superovulated gilts. *Theriogenology* 41(2): 447-452.
- Surv** Laurinolli, M. and Bendell-Young, L. I. 1996. copper, zinc, and cadmium concentrations in peromyscus maniculatus sampled near an abandoned copper mine. *Arch Environ Contamin Toxicol.* 30(4): 481-486.
- Unrel** Lauweryns, J. M. and Peuskens, J. 1969. electron microscopical evaluation of the osmic acid-zinc iodide nerve staining technique (method of champy-maillet) on pulmonary tissue. *Acta Anatomica* 74(1): 125-37.
- Bio Acc** Lavin Gonzalez, S., Monreal Bosch, L., Abad Gavin, M., and Fernandez Celadilla, L. 1988. influence of reproductive status on the levels of zinc in the blood of cattle. *Medicina Veterinaria* 5(11): 601-602, 604-605.
- FL** Lavin Gonzalez, S., Monreal Bosch, L. Universidad Autonoma de Barcelona Spain Facultad de Veterinaria, Abad Gavin, M., and Fernandez Celadilla, L. 1988. zinc concentrate in cattle plasma. <original> influencia del estado reproductivo sobre los niveles de cinc en la sangre del ganado vacuno. *Medicina Veterinaria.* V. 5(11) P. 601-605
- Nut def** Lavin, S. 1986. study of subclinical deficiency of copper and zinc in mountain cattle. *Anales De Veterinaria De Murcia* 2: 73-86.
- Unrel** Lavin, T. N., Baxter, J. D., and Horita, S. 1988. the thyroid hormone receptor binds to multiple domains of the rat growth hormone 5'-flanking sequence. *Journal of Biological Chemistry* 263(19): 9418-26.
- Alt** Lavy, U. I. 1972. the effect of oral supplementation of zinc sulphate on primary wound healing in rats. *British Journal of Surgery* 59(3): 194-196.
- Nut def** Law, J. S., McBride, S. A., Graham, S., Nelson, N. R., Slotnick, B. M., and Henkin, R. I. in vivo effects of zinc deficiency on calmodulin concentrations in selected rat tissue. *Life Sci.* (1987) 41(24): 2597-606.
- Nut def** Law, J. S., McBride, S. A., Graham, S., Nelson, N. R., Slotnick, B. M., and Henkin, R. I. 1987. in vivo effects of zinc deficiency on calmodulin concentrations in selected rat tissues. *Life Sciences* 41(24): 2597-606.
- Nut def** Law, J. S., McBride, S. A., Graham, S., Nelson, N. R., Slotnick, B. M., and Henkin, R. I. zinc deficiency decreases the activity of calmodulin regulated cyclic nucleotide phosphodiesterases in vivo in selected rat tissues. *Biol. Trace Elem. Res.* (1988) 16(3): 221-6.
- Fate** Law, J. S., Nelson, N., and Henkin, R. I. 1983. zinc localization in taste bud membranes. *Biological Trace Element Research* 5(3): 219-224.
- CP** Law, J. S., Werman, M. J., Castro, J. S., and Bhatena, S. J. effects of dietary carbohydrates and zinc on hormonal profile in copper adequate and copper-deficient rats. *1992 MEETING OF THE*

FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY (FASEB), PART I, ANAHEIM, CALIFORNIA, USA, APRIL 5-9, 1992. FASEB (FED AM SOC EXP BIOL) J. 6 (4). 1992. A1098.

- CP** Lawler, G. S. and Oberleas, D. 1978. importance of adequate dietary zinc in protein evaluation. *Federation Proceedings* 37(3): 584.
- Abstract** Lawrence, B. V(A), Anderson, D. B., Cline, T. R(A), and Adeola O(A). 1998. influence of pharmacological zinc supplementation and diet particle size on growth, and nutrient availability in young pigs. *Journal of Dairy Science* 81(SUPPL. 1): 158.
- Abstract** Lawrence, B. V(A), Anderson, D. B., Cline, T. R(A), and Adeola O(A). 1998. influence of zinc and diet particle size on growth, and stomach morphology in young pigs. *Journal of Dairy Science* 81(SUPPL. 1): 158.
- Nut def** Lawson, M. J., Butler, R. N., Goland, G. J., Jarrett, I. G., Roberts-Thomson, I. C., Partick, E. J., and Dreosti, I. E. 1988. zinc deficiency is associated with suppression of colonocyte proliferation in the distal large bowel of rats. *Biological Trace Element Research* 18: 115-21 .
- Nut def** Lawson, Michael J., Butler, Ross N., Goland, Gary J., Jarrett, Ivan G., Roberts-Thomson, Ian C., Partick, Eric J., and Dreosti, Ivor E. zinc deficiency is associated with suppression of colonocyte proliferation in the distal large bowel of rats. *Biol. Trace Elem. Res. (1988)* : 18, 115-21.
- FL** Lazaris, I. a. A., Bavel'skii, Z. E., and Boguslavskia, D. M. 1975. [alterations in the histostucture of the pancreas in experimental diabetes caused by quinoline derivatives]. <original> izmeneniia gistostrukury podzheludochnoi zhelezy pri eksperimental'nom diabete, vyzvannom proizvodnymi khinolina. *Problemy Endokrinologii* 21(2): 91-5.
- No COC** Lazaris, J. A. and Babel'skyi, F. J. 1979. preventive effect of diethyldithiocarbamate on experimental diabetes produced by dithisone and 8-oxychinoline. *Endocrinologia Experimentalis* 13(1): 39-51.
- No Oral** Lazaris, J. A. and Bavel'sky, Z. E. 1984. dithisone diabetes in rabbits and its prevention by sulfhydryl and imidazole containing compounds. *Endocrinologia Experimentalis* 18(3): 157-67.
- FL** Lazaris, Y. A., Bavel'skii, Z. E., and Korchin, V. I. possible role of zinc blocking in the development of dithisone diabetes. *Byulleten' Eksperimental'Noi Biologii i Meditsiny.* 71 (2). 1971 30-33.
- FL** Lazaris Ya A and Bavel'skii, Z. E. anti diabetogenic action of maninil. *Problemy Endokrinologii.* 25 (1). 1979. 31-36.
- Phys** Lazaris, Ya. A., Bavel'skii, Z. E., and Korchin, V. I. possible role of zinc blocking in the development of dithizone-diabetes. *Byull. Eksp. Biol. Med. (1971)* 71(2): 30-3 .
- FL** Lazaris, Ya. A. and Meiramov, G. G. role of zinc blockade in the pathogenesis of dithizone diabetes. *Probl. Endokrinol. (1974)* 20(5): 90-4.
- FL** Lazarov, E., Tatarov, B., Kunchev, L., and Kostov, G. 1972. effect of zinc on the embryonic development of hens. *Nauchni Tr. Vissh Selskostop. Inst. Sofia, Zootekh. Fak.* 22: 341-9.
- In Vit** Lazo John S(A), Kondo Yukihiro, Dellapiazza Dana, Michalska Anna E, Choo, K. H. Andy, and Pitt Bruce R. 1995. enhanced sensitivity to oxidative stress in cultured embryonic cells from transgenic mice deficient in metallothionein i and ii genes. *Journal of Biological Chemistry*

270(10): 5506-5510.

- CP** Lazovski, H., Trostler, N., and Thaler, M. 1986. growth in rats fed cottonseed meal (csm) supplemented with lysine (l) and zinc (zn). *Federation Proceedings* 45: 594.
- Abstract** Lazovski, H., Trostler, N., and Thaler, M. growth in rats fed cottonseed meal supplemented with lysine and zinc. *70TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 13-18, 1986. FED PROC.* 45 (3). 1986. 594.
- HHE** Le Bourdelles B, Wafford, K. A., Kemp, J. A., Marshall, G., Bain, C., Wilcox, A. S., Sikela, J. M., and Whiting, P. J(A). 1994. cloning, functional coexpression, and pharmacological characterisation of human cdnas encoding nmda receptor nr1 and nr2a subunits. *Journal of Neurochemistry* 62(6): 2091-2098.
- Abstract** Le Mieux F M, Ellison, L. V., Ward, T. L., Southern, L. L., and Bidner, T. D. 1995. excess dietary zinc for pigs weaned at 28 days. *Journal of Animal Science* 73(SUPPL. 1): 72.
- CP** Lear, P. M. and Prohaska, J. R. 1997. atria and ventricles of copper-deficient rats exhibit similar hypertrophy and similar altered biochemical characteristics. *Proceedings Of The Society For Experimental Biology And Medicine.* 215(4): 377-385.
- Rev** Leary, W. P., Olhaberry, J. V., Reyes, A. J., and Lockett, C. J. 1983. zinc-metabolism under physiological conditions. *South African Medical Journal* 64(8): 283-284.
- Abstract** Lease, J. G. effect of dietary histidine on tibia alkaline phosphatase and leg deformities of chicks given a low zinc sesame-d meal diet. *FED PROC. Federation Proceedings.* 30 (2). 1971 643
- Mix** Lease, J. G. 1968. effect of graded levels of cadmium on tissue uptake of 65zn by the chick over time. *Journal of Nutrition* 96(3): 294-302.
- Nut def** Lease, J. G. effect of histidine on tibia alkaline phosphatase of chicks fed zinc-deficient sesame meal diets. *J. Nutr. (1972)* 102(10): 1323-30.
- Nut def** Lease, J. G. effect of variations in dietary protein and amino acids on the alkaline phosphatase of the zinc-deficient chick. *J. Nutr. (1975)* 105(4): 385-92.
- Abstract** Lease, J. G. variation in mortality of chicks fed low zinc diets based on raw and on cooked egg white. *Federation Proceedings.* 33 (3 Part 1). 1974 703
- Abstract** Lease, J. G. variation in tissue alkaline phosphatase in chicks fed casein or isolated soy low zinc diets. *Federation Proceedings.* 32 (3 Part 1). 1973 895
- CP** Leat, W. M. F. 1983. nutritional deficiencies and fatty acid metabolism. *Proceedings of the Nutrition Society* 42(2): 333-342.
- Mix** Leaver, A. G. effect of vitamin d upon the uptake and release of zinc by bone. *Arch. Oral Biol. (1967)* 12(6): 773-5 .
- In Vit** Leazer, T. M., Keen, C. L., Daston, G. P., and Rogers, J. M. lipopolysaccharide (lps) embryotoxicity: maternally-mediated mechanism vs. direct effects in whole embryo culture. *Teratology* 1995 Mar;51(3):158-9
- No Oral** Leazer, T. M., Keen, C. L., Daston, G. P., and Rogers, J. M. pretreatment with zn or low doses of lipopolysaccharide (lps) protects against lps developmental toxicity. *Toxicologist* 1995

- No Oral** Leazer, T. M., Keen, C. L., Daston, G. P., and Rogers, J. M. zn pretreatment, but not co-administration, protects against the developmental toxicity of lps in the mouse. *Teratology* 1994 May;49(5):369-70
- No Oral** Leber, A. P. and Miya, T. S. 1976. a mechanism for cadmium- and zinc-induced tolerance to cadmium toxicity: involvement of metallothionein. *Toxicology and Applied Pharmacology* 37(3): 403-14.
- No COC** Lebzien, P., Rohr, K., and Engling, F. P. 1993. effects of protected and unprotected methionine on the digestive processes and on the methionine content of blood plasma in dairy cows. *Landbauforschung Volkenrode* 43(4): 224-235.
- FL** Lechowski Roman and Lenarcik Maciej. 1994. feeding and skin diseases in dogs and cats: a review. *Medycyna Weterynaryjna* 50(10): 477-479.
- FL** Ledec, Miroslav, Koci, Stefan, and Skrobanek, Peter. extension of the productive life of laying hens with the administration of chemical agents. *Agrochemia* (1979) 19(12): 380-3 .
- Abstract** Lee, A. O., Jacobs, R. M., Fox, M. R. S., Fry, B. E. Jr, and Huisinigh, D. the biological availability of zinc-65 from soybeans in japanese quail. *Federation Proceedings*. 34 (3). 1975 907
- Unrel** Lee, C. H., Chang, L., and Wei, L. N. 1996. molecular cloning and characterization of a mouse nuclear orphan receptor expressed in embryos and testes. *Vol. 44, No. 3, Pp. 305-314* Mol. Reprod. Dev.
- In Vit** Lee, C. Y., Green, M. L., Simmen, R. C. M., and Simmen, F. A. 1998. proteolysis of insulin-like growth factor-binding proteins (igfbps) within the pig uterine lumen associated with peri-implantation conceptus development. *Journal of Reproduction and Fertility* 112(2): 369-377.
- Nut def** Lee, Clarence M., Humphrey, Patricia A., and Aboko-Cole, Georgiana F. interaction of nutrition and infection: effect of zinc deficiency on immunoglobulin levels in trypanosoma musculi infection. *J. Natl. Med. Assoc.* (1983) 75(7): 677-82.
- Nut def** Lee, Clarence M., Humphrey, Patricia A., and Aboko-Cole, Georgiana F. interaction of nutrition and infection: effect of zinc deficiency on resistance to trypanosoma musculi. *Int. J. Biochem.* (1983) 15(6): 841-7.
- Surv** Lee, D. P., Honda, K., Tatsukawa, R., and Won, P. O. 1989. distribution and residue level of mercury, cadmium and lead in korean birds. *Bull. Environ. Contam. Toxicol.* 43(4): 550-555.
- No Oral** Lee, D. Y., Brewer, G. J., and Wang, Y. X. 1989. treatment of wilson's disease with zinc. vii. protection of the liver from copper toxicity by zinc-induced metallothionein in a rat model. *Journal of Laboratory and Clinical Medicine* 114(6): 639-45.
- Abstract** Lee, D. Y., Hamilton, C. R., Libal, G. W., and Peters, D. N. 1996. effect of diet composition on the response of newly weaned pigs to zinc oxide or apramycin sulfate. *Journal of Animal Science* 74(SUPPL. 1): 57.
- Nut def** Lee, D. Y., Schroeder, J. 3d, and Gordon, D. T. 1988. enhancement of cu bioavailability in the rat by phytic acid. *Journal of Nutrition* 118(6): 712-7.
- Abstract** Lee D-Y, Schroeder, J. Iii, and Gordon, D. T. the effect of phytic acid on copper bio availability. 68TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR

EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 1-6, 1984 FED PROC. 43 (3). 1984. Abstract 1934.

- CP** Lee Doh-Yeel and Bao Bin. 1993. abnormal zinc metabolism in lactating lethal milk mice. *FASEB Journal* 7(3-4): A733.
- Nut def** Lee Doh-Yeel(A), Prasad Ananda S, and Brewer George J. 1993. neonatal zinc deficiency in pups nursing on lethal milk dams. *Journal of Trace Elements in Experimental Medicine* 6(2): 45-52.
- Nut def** Lee, H. B. and Kim, Y. H. 1981. dietary control of parakeratosis in swine (zinc deficiency). *Korean Journal of Veterinary Research* 21(1): 51-58.
- Nut def** Lee, H. B., Park, C. K., Lee, H. S., and Lee, C. S. 1979. occurrence of parakeratosis in swine. *Korean Journal of Veterinary Research* 19(2): 153-157.
- CP** Lee, J., Grace, N. D., and Rounce, J. R. 1994. cadmium accumulation in liver and kidney of sheep grazing ryegrass/white clover pastures. *Proceedings of the New Zealand Society of Animal Production* 54: 31-34.
- Rev** Lee, J., Masters, D. G., White, C. L., Grace, N. D., and Judson, G. J. 1999. current issues in trace element nutrition of grazing livestock in australia and new zealand. *Australian Journal of Agricultural Research* 50(8): 1341-1364.
- FL** Lee, J. H. and Cerklewski, F. L. 1990. influence of alcohol and low dietary copper on copper utilization of maternal and offspring liver. *Korean Journal of Nutrition* 23(6): 443-450.
- Nut def** Lee, J. S. and Fong, L. Y. 1986. decreased glutathione transferase activities in zinc-deficient rats. *Carcinogenesis* 7(7): 1111-3.
- Gene** Lee, J. Y., Kambe, M., Hayashi, M., and Takenaga, K. 1998. cloning and characterization of a novel zinc finger protein that associates with nuclear matrix. *DNA and Cell Biology* 17(10): 849-58.
- No COC** Lee Jeffrey, Platt Kenneth A, Censullo Patricia, and Ruiz, I. Altaba Ariel(A). 1997. gli1 is a target of sonic hedgehog that induces ventral neural tube development. *Development (Cambridge)* 124(13): 2537-2552.
- Nut** Lee, Jeong Sook and Cho, Soo Yeul. effects of dietary protein and calcium levels on calcium, iron, copper, zinc and magnesium level of the tissues of lead-administered rats. *Han'Guk Yongyang Siklyong Hakhoechi* (1993) 22(2): 109-15 .
- In Vit** Lee Jones, A. O., Spivey Fox, M. R., and Fry, B. E. Jr. 1985. in vitro assessment of zinc binding to protein foods as a potential index of zinc bioavailability. comparison of in vitro and in vivo data. *Journal Of Agricultural And Food Chemistry*. 33(6): 1123-1128.
- Fate** Lee, K. and Garcialopez, J. S. 1985. iron, zinc, copper and magnesium binding by cooked pinto bean (*phaseolus-vulgaris*) neutral and acid detergent fiber. *Journal Of Food Science* 50(3): 651&.
- Diss** Lee, K. W. and Lee, H. B. 1987. the effects of dietary cadmium, zinc, iron and copper on concentrations in tissues and hair of rats. *Korean Journal of Veterinary Research* 27(2): 361-383.
- Nut def** Lee, Kyeung Soon, Cho, Soo Yeul, and Seo, Jung Sook. effects of dietary levels of vitamin a

on lipid composition and zn contents in zn-deficient rats. *Han'Guk Yongyang Siklyong Hakhoechi* (1994) 23(1): 1-6.

- Unrel** Lee, M., Hartsfield, J. K. Jr, and Hilbelink, D. R. smoking risk factors and clefting: interaction of cadmium and zinc. *J Dent Res* 1990;69(Spec Issue Mar):111
- OAC** Lee, M. H., Cowling, R. A., Sander, E. G., and Pettigrew, D. W. bovine liver dihydropyrimidine amidohydrolase ph dependencies of inactivation by chelators and steady-state kinetic properties. *Archives of Biochemistry and Biophysics*. 248 (1). 1986. 368-378.
- Mix** Lee, Mi-Kyung, Cho, Soo-Yeul, Park, Eun-Mi, and Kim, Myung-Joo. the effect of dietary zinc on lipid metabolism in cadmium treated rats. *Han'Guk Yongyang Siklyong Hakhoechi* (1994) 23(5): 718-24 .
- Drug** Lee, P. W. and Green, M. A. 1972. zinc and wound healing. *Lancet* 2(7786): 1089.
- Drug** Lee, P. W. R., Green, M. A., Long, W. B. Iii, and Gill, W. zinc and wound healing. *SURG GYNECOL OBST.* 143 (4). 1976 549-554.
- Nut def** Lee, Rita G., Rains, Tia M., Tovar-Palacio, Claudia, Beverly, J. Lee, and Shay, Neil F. zinc deficiency increases hypothalamic neuropeptide y and neuropeptide y mrna levels and does not block neuropeptide y-induced feeding in rats. *J. Nutr.* (1998) 128(7): 1218-1223.
- Unrel** Lee, S. G. and Hahn, T. S. an experimental study on the effects of calcium hydroxide and formo cresol to the amputated pulp tissue. *Korea University Medical Journal.* 18 (1). 1981. 281-298.
- No Oral** Lee, S. H., Choi, Y. J., Jeong, Y. N., Kim, H. S., Lee, S. H., Kim, I. C., Oh, Y. S., and Lee, Y. H. 1998. high-performance liquid chromatographic determination of a new oral thrombin inhibitor in the blood of rats and dogs. *Journal of Chromatography* 714(2): 379-83.
- No COC** Lee, S. J., Kim, S. S., Suh, O. S., Na, J. C., Lee, S. H., and Chung, S. B. 1993. effect of dietary antibiotics and probiotics on the performance of broiler. *RDA Journal of Agricultural Science, Livestock* 35(2): 539-548.
- Gene** Lee Te-Chung, Zhang Yue, and Schwartz Robert J(A). 1994. bifunctional transcriptional properties of yy1 in regulating muscle actin and c-myc gene expression during myogenesis. *Oncogene* 9(4): 1047-1052.
- Abstract** Lee, Y. A. K., Faraji, B., and Swendseid, M. E. 1983. effects of a histidine-free diet on the zinc-metabolism of rats. *Aktuelle Ernährungsmedizin* 8: 99.
- No COC** Lee, Y. C., Simamora, P., and Yalkowsky, S. H. 1997. systemic delivery of insulin via an enhancer-free ocular device. *Journal of Pharmaceutical Sciences* 86(12): 1361-4.
- Gene** Lee, Y. J., Chen, Y. P., Wang, S. H., Chow, W. Y., and Lin, L. Y. 1996. structure and expression of metallothionein gene in ducks. *Gene.* 176(1/2): 85-92.
- CP** Lee Yungchi(A), Simamora Pahala, and Yalkowsky Samuel H(A). 1997. controlled systemic delivery of insulin via ocular route. *Pharmaceutical Research (New York)* 14(11 SUPPL.): S325.
- Surv** Leech, A. F. and Thornton, I. trace elements in soils and pasture herbage on farms with bovine hypocupremia. *Journal of Agricultural Science.* 108 (3). 1987. 591-598.
- Prim** Leek, J. C., Keen, C. L., Vogler, J. B., Golub, M. S., Hurley, L. S., Hendrickx, A. G., and

- Gershwin, M. E. 1988. long-term marginal zinc deprivation in rhesus monkeys. iv. effects on skeletal growth and mineralization. *American Journal of Clinical Nutrition* 47(5): 889-95.
- Prim** Leek, James C., Vogler, James B., Gershwin, M. Eric, Golub, Mari S., Hurley, Lucille S., and Hendrickx, Andrew G. studies of marginal zinc deprivation in rhesus monkeys . v. fetal and infant skeletal effects. *Am. J. Clin. Nutr.* (1984) 40(6): 1203-12
- No Oral** Leenders, Jeannette, van Driel, Chris, and Busker, Ruud. comparison of hexachloroethane smoke with three alternative smokes. toxicity and performance measurements. *Proc. Int. Pyrotech. Semin.* (1996) : 22nd, 263-274.
- No COC** Leengoed, L. A. M. G. van and Kamp, E. M. 1989. endobronchial inoculation of various doses of haemophilus(actinobacillus) pleuropneumoniae in pigs. *American Journal of Veterinary Research* 50(12): 2054-2059.
- No Oral** LEES, G. J., LEHMANN, A., SANDBERG, M., and HAMBERGER, A. the neurotoxicity of zinc in the rat hippocampus. *NEUROSCI LETT*; 120 (2). 1990. 155-158.
- No COC** Leeson, S. 1984. growth and carcass characteristics of chicken and turkey broilers fed diets containing flavomycin. *Canadian Journal of Animal Science* 64(4): 971-976.
- Mix** Leeson, S. and Summers, J. D. 1983. effect of composition and storage conditions of mineral premixes on early chick growth. *Nutrition Reports International* 28(4): 873-879.
- Nut def** Lefebvre, Donatienne, Boney, Charlotte M., Ketelslegers, Jean-Marie, and Thissen, Jean-Paul. inhibition of insulin-like growth factor- α mitogenic action by zinc chelation is associated with a decreased mitogen-activated protein kinase activation in rat α -1 fibroblasts. *FEBS Lett.* (1999) 449(2,3): 284-288.
- Nut def** Lefevre, Michael, Keen, Carl L., Loenneker, Bo, Hurley, Lucille S., and Schneeman, Barbara O. different effects of zinc and copper deficiency on composition of plasma high density lipoproteins in rats. *J. Nutr.* (1985) 115(3): 359-68.
- No Oral** Lehman, L. D. and Klaassen, C. D. 1986. separation and quantitation of metallothioneins by high-performance liquid chromatography coupled with atomic absorption spectrophotometry. *Analytical Biochemistry* 153(2): 305-14.
- No Dose** Lehman-McKeeman, L. D., Andrews, G. K., and Klaassen, C. D. ontogeny and induction of hepatic isometallothioneins in immature rats. *Toxicology and Applied Pharmacology*. 92 (1). 1988. 10-17.
- Abstract** Lei, K. Y. dietary copper deficiency effects on cholesterol metabolism in the rat. *FED PROC. Federation Proceedings*. 36 (3). 1977 1151
- Abstract** Lei, K. Y., Prasad, A. S., Bowersox, E., and Oberleas, D. oral contraceptives norethindrone and mestranol effect on zinc and copper metabolism. *Federation Proceedings*. 34 (3). 1975 922
- Nut def** Lei, K. Y., Prasad, A. S., Bowersox, E., and Oberleas, D. oral contraceptives, norethindrone and mestranol: effects on tissue levels of minerals. *Am. J. Physiol.* (1976) 231(1): 98-103.
- CP** Lei, X. G., Ku, P. K., Miller, E. R., Ullrey, D. E., and Yokoyama, M. T. supplemental dietary microbial phytase improves bioavailability of zinc as well as phytate phosphorus in a corn-soybean meal diet for weanling pigs. *MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE AND INTERNATIONAL SOCIETY OF APPLIED ETHOLOGY, PITTSBURGH, PENNSYLVANIA, USA, AUGUST 8-11, 1992. J ANIM SCI.* 70 (Suppl. 1). 1992. 229.

- Abstract** Lemarie, S. L., Hembry, F. G., Southern, L. L., and Miller, J. E. effect of dietary lasalocid and/or copper on lamb performance and tissue concentrations of copper and zinc. *ANNUAL MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE, LOGAN, UTAH, USA, JULY 28-31, 1987. J ANIM SCI.* 65 (Suppl. 1). 1987. 454-455.
- Rev** Lemasters, G. K. 1981. zinc insufficiency during pregnancy. a review. *JOGN Nursing* 10(2): 124-5.
- Abstract** Lemieux, F. M., Southern, L. L., and Bidner, T. D. 1996. interactive effects of chromium tripicolinate, zinc oxide, and/or betaine on growth performance of weanling pigs. *Journal of Animal Science* 74(SUPPL. 1): 184.
- Abstract** Lemieux, F. M., Southern, L. L., Ward, T. L., and Bidner, T. D. 1995. growth performance of weanling pigs fed excess dietary zinc. *Journal of Animal Science* 73(SUPPL. 1): 172.
- FL** Lemke, H., Oettel, M., and Chemnitz, K.-H. 1974. (pharmacological and endocrinological findings in animal experiments with the metallocene preparations, turisynchron and suisynchron. 2. toxicological findings). *Archiv Fur Veterinarmedizin* 28(Heft 5): 651-670.
- Abstract** Lemmo, E. A. and Evans, J. L. serum hydroxy proline as an index for calcium nutrition and its interaction on tissue zinc and copper in growing pregnant and lactating rats. *13TH ANNUAL CONFERENCE, COLUMBIA, MO., USA, JUNE 4-7, 1979. PROC UNIV MO ANNU CONF TRACE SUBST ENVIRON HEALTH.* 13 (0). 1979 (Recd. 1980). 461-468.
- In Vit** Lenartova, V., Holovska, K., and Havassy, I. 1981. origin of glutamate dehydrogenase from the mucosa of the sheep rumen. *Physiologia Bohemoslovaca.* 30(1): 47-54.
- Abstract** Lender, M., Rubenstein, M., and Menczel, J. intestinal absorption and tissue uptakes of zinc-65 during different single oral doses of calcium. *14TH ANNUAL CONFERENCE ON TRACE SUBSTANCES IN ENVIRONMENTAL HEALTH, COLUMBIA, MO., USA, JUNE 2-5, 1980. PROC UNIV MO ANNU CONF TRACE SUBST ENVIRON HEALTH.* 14 (0). 1980 (Recd. 1981). 232-237.
- Chem Meth** Lenglet, W. J. M., Bos, A. J. J., v.d. Stap, C. C. A. H., Vis, R. D., Delhez, H., and Van der Hamer, C. J. A. discrepancies between histological and physical methods for trace element mapping in the rat brain. *Histochemistry (1984)* 81(3): 305-9.
- Drug** Lennard, E. S. 1980. implications in the burn neutrophil of serum and cellular zinc levels. *Journal of Surgical Research* 29(1): 75-82.
- Drug** Lennard, E. Stan. implications in the burn neutrophil of serum and cellular zinc levels. *J. Surg. Res. (1980)* 29(1): 75-82.
- FL** Leo, M., Kolb, E., Erices, J., and Nestler, K. 1995. the content of Na, K, Ca, Mg, total-P, Fe, Cu and Zn in several tissues and the placenta of sheep fetuses and in newborn lambs. *Berliner Und Munchener Tierarztliche Wochenschrift* 108(5): 179-184.
- No COC** Leo, M. A., Kim, C., and Lieber, C. S. 1986. increased vitamin A in esophagus and other extrahepatic tissues after chronic ethanol consumption in the rat. *Alcoholism, Clinical and Experimental Research* 10(5): 487-92.
- No COC** Leo, M. A., Kim, C. I., and Lieber, C. S. 1988. increased vitamin A in esophagus and lungs after moderate ethanol consumption. *Drug-Nutrient Interactions* 5(4): 227-36.
- Unrel** Leo, Maria Anna, Kim, Cho Il, and Lieber, Charles S. increased vitamin A in esophagus and other

extrahepatic tissues after chronic ethanol consumption in the rat. *Alcohol.: Clin. Exp. Res.* (1986) 10(5): 487-92.

- Mix** Leonard, A., Deknuddt, Gh., and Debackere, M. 1974. cytogenetic investigations on leucocytes of cattle intoxicated with heavy metals. *Toxicology* 2(No.3): 269-273.
- Unrel** Leonardo, M. R., Comelli Lia, R. C., Esberard, R. M., and Benatti Neto, C. 1984. immediate root canal filling: the use of cytophyllactic substances and noncytotoxic solutions. *Journal of Endodontics* 10(1): 1-8.
- Unrel** Leonardo, M. R., Silva, L. A., Utrilla, L. S., Assed, S., and Ether, S. S. 1997. calcium hydroxide root canal sealers--histopathologic evaluation of apical and periapical repair after endodontic treatment. *Journal of Endodontics* 23(7): 428-32.
- FL** Leonov, V. A., Gatsko, G. G., and Gul'ko, V. V. 1968. zinc level in the pancreas in relation to age. *Vestsi Akad. Navuk Belarus. SSR Ser. Biyal. Navuk* (5): 129-30.
- CP** Leontowicz, H., Gralak, M., Kulasek, G., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. the effect of potassium loading on some macro and microelements balance in sheep. <document title>trace elements in man and animals - tema 8: proceedings of the eighth international symposium on trace elements in man and animals. 672-673.
- Mineral** Leontowicz, H., Gralak, M., Leontowicz, M., Kulasek, G., Krzeminski, R., and Lesniewska, V. 1995. the effects of calcium and sodium loading on organic matter digestibility and mineral absorption in sheep. 2. absorption of minerals. *Journal of Animal and Feed Sciences* 4(4): 311-319.
- FL** Leotta, R., Gatta, D., Tocchini, M., and Mira, M. Del. 1984. use of zinc bacitracin for feeding female meat turkeys. *Annali Della Facolta Di Medicina Veterinaria Di Pisa* 37: 319-328.
- Nut def** Lepage, Lynne M., Giesbrecht, Jeri-Anne C., and Taylor, Carla G. expression of t lymphocyte p56lck, a zinc-finger signal transduction protein, is elevated by dietary zinc deficiency and diet restriction in mice. *J. Nutr.* (1999) 129(3): 620-627.
- Drug** Leray, C., Andriamampandry, M. D., Freund, M., Gachet, C., and Cazenave, J. P. 1998. simultaneous determination of homologues of vitamin e and coenzyme q and products of alpha-tocopherol oxidation. *Journal of Lipid Research* 39(10): 2099-105.
- Nut def** Leure-duPree, A. E. and McClain, C. J. 1982. the effect of severe zinc deficiency on the morphology of the rat retinal pigment epithelium. *Investigative Ophthalmology & Visual Science* 23(4): 425-34.
- Nut def** Leure-Dupree, A. E., Rothman, R. J., and Fosmire, G. J. the effect of zinc deficiency on the ultrastructure of rat adrenal cortex. *American Journal of Anatomy.* 165 (3). 1982. 295-304.
- Nut def** Leure-duPree, Alphonse E. and McClain, Craig J. the effect of severe zinc deficiency on the morphology of the rat retinal pigment epithelium. *Invest. Ophthalmol. Visual Sci.* (1982) 23(4): 425-34.
- Nut def** Leuredupree, A. E. 1986. vascularization of the rat cornea after prolonged zinc-deficiency. *Anatomical Record* 216(1): 27-32.
- Mix** Levensgood, J. M., Sanderson, G. C., Anderson, W. L., Foley, G. L., Brown, P. W., and Seets, J. W. 2000. influence of diet on the hematology and serum biochemistry of zinc-intoxicated mallards. *Journal Of Wildlife Diseases.* 36(1): 111-123.

- Nut def** Levenson, Cathy W., Shay, Neil F., Hempe, James M., and Cousins, Robert J. expression of cysteine-rich intestinal protein in rat intestine and transfected cells is not zinc dependent. *J. Nutr.* (1994) 124(1): 13-17.
- no COC** Levenson, Cathy W., Shay, Neil F., Lee-Ambrose, Linda M., and Cousins, Robert J. 1993. regulation of cysteine-rich intestinal protein by dexamethasone in the neonatal rat. *Proc. Natl. Acad. Sci. U. S. A.* 90(2): 712-15 .
- Alt** Levi, G., Topilko, P., Schneider-Maunoury, S., Lasagna, M., Mantero, S., Cancedda, R., and Charnay, P. 1996. defective bone formation in krox-20 mutant mice. *Development* 122(1): 113-20.
- HHE** Levin, M. L., Chatterjee, A., Pragliola, A., Worley, K. C., Wehnert, M., Zhuchenko, O., Smith, R. F., Lee, C. C., and Herman, G. E. 1996. a comparative transcription map of the murine bare patches (bpa) and striated (str) critical regions and human xq28. *Genome Research* 6(6): 465-77.
- Alt** Levine, A. S. AJCNA, McClain, C. J., Handwerger, B. S., Brown, D. M., and Morley, J. E. 1983. tissue zinc status of genetically diabetic and streptozotocin-induced diabetic mice. *American Journal Of Clinical Nutrition.* 37 (3): 382-386.
- Alt** Levine, Allen S., McClain, Craig J., Handwerger, Barry S., Brown, David M., and Morley, John E. tissue zinc status of genetically diabetic and streptozotocin-induced diabetic mice. *Am. J. Clin. Nutr.* (1983) 37(3): 382-6.
- Phys** Levkovitz, Y., Avignone, E., Groner, Y., and Segal, M A. 1999. upregulation of gaba neurotransmission suppresses hippocampal excitability and prevents long-term potentiation in transgenic superoxide dismutase-overexpressing mice. *Journal of Neuroscience* 19(24): 10977-10984.
- FL** Levkutova, M. and Bajova, V. Univerzita Veterinarskeho Lekarstva Kosice CSFR. 1992. the effects of zindep preparation on the level of b-lymphocytes in pregnant cows. <original> vplyv pripravku zindep na hladinu b-lymfocytov u gravidnych krav. *Veterinarni Medicina - UVTIZ.* V. 37(5-6) P. 257-260
- Mineral** Levrat-Verny Marie-Anne(A), Coudray Charles, Bellanger Jacques, Lopez Hubert W, Demigne Christian, Rayssiguier Yves, and Remesy Christian. 1999. wholewheat flour ensures higher mineral absorption and bioavailability than white wheat flour in rats. *British Journal of Nutrition* 82(1): 17-21.
- Acu** Levy, B. M. and Higgins G. M. 1965. reactions within the lungs of guinea pigs to the intratracheal administration of zinc beryllium silicate. *Am.Ind.Hyg.Assoc.J.* 26: 227-235.
- Phys** Levy, F., Locatelli, A., Piketty, V., Tillet, Y., and Poindron, P. 1995. involvement of the main but not the accessory olfactory system in maternal behavior of primiparous and multiparous ewes. *Physiology & Behavior* 57(1): 97-104.
- Drug** Lewis, D. T., Messinger, L. M., Ginn, P. E., and Ford, M. J. 1998. a hereditary disorder of cornification and multiple congenital defects in five rottweiler dogs. *Veterinary Dermatology* 9(1): 61-72.
- OAC** Lewis, R. D., Johnson, M. A., Dengal, D. R., Jones, M. T., and Norton, K. I. 1993. the effects of maternal training on plasma copper, magnesium and zinc in rats. *Nutrition Research* 13(7): 771-778.

- No Dose** Li Chingwen, Booze Rosemarie M, and Hersh Louis B(A). 1995 . tissue-specific expression of rat neutral endopeptidase (neprilysin) mrnas. *Journal of Biological Chemistry* 270(11): 5723-5728.
- Nut def** Li Cui, Takagi, Y., Sando, K., Wasa, M., and Okada, A. 2000. nitric oxide synthase inhibitor attenuates inflammatory lesions in the skin of zinc-deficient rats. *Nutrition* 16(1): 34-41.
- FL** Li, Dengsong, Qiao, Shengmin, Yang, Xiao, and Hou, Xun. the evaluation of nutritional value of food fortified with lysine, iron, calcium, and zinc. *Yingyang Xuebao (1987)* 9(2): 143-9.
- Drug** Li, F. and Yu, Z. 1996. [therapeutic effect of trace element on ulcerative colitis experimental study]. *Chung-Hua i Hsueh Tsa Chih* 76(10): 756-8.
- Meth** Li, F. M., Lim, C. K., and Peters, T. J. 1987. an hplc assay for rat liver ferrochelatase activity. *Biomedical Chromatography* 2(4): 164-8.
- No Oral** Li, Famei, Lim, Chang Kee, and Peters, Timothy J. an hplc assay for rat liver ferrochelatase activity. *Biomed. Chromatogr. (1987)* 2(4): 164-8.
- Nut def** Li, G., Tovar-Palacio, C., and Shay, N. F. 1996. zinc deficiency induced anorexia and hypothalamic neuropeptide y. *FASEB Journal* 10(3): A223.
- Nut** Li, Guoxiong and Li, Ying. re-evaluation of phytic acid values. *Shipin Kexue (Beijing) (1991)* : 138, 6-8.
- Phys** Li, H. and Otvos, J. D. 1998. biphasic kinetics of Zn^{2+} removal from Zn metallothionein by nitrilotriacetate are associated with differential reactivity of the two metal clusters. *Journal of Inorganic Biochemistry* 70(3-4): 187-94.
- Org Met** Li, J. H. and Marsh, R. E. ld50 determination of zinc phosphide toxicity for house mice and albino laboratory mice. *Proceedings ... Vertebrate Pest Conference*. 1988. (13th) p. 91-94.
- FL** Li Jie and Xu ZhenYing. 1995. dietary molar phytic acid:zinc ratio as a determinant of zinc bioavailability in chickens. *Acta Veterinaria Et Zootechnica Sinica* 26(1): 12-17.
- FL** Li Jie (Northeast Agricultural Coll. Harbin (China). Lab. of Animal Nutrition). 1994. studies on correlation between dietary zinc levels and zinc bioavailability for broilers. *Acta Zoonutrimenta Sinica*. V. 6(2) P. 45-49
- FL** Li Jie (Northeast Agricultural Coll., Harbin China Lab. of Animal Nutrition. 1994. effect of phytic acid level in diet on the utilization of zinc in broilers. *Chinese Journal of Animal Science*. V. 30(6) P. 2-4
- Nut** Li Jie (Northeast Agricultural, Coll. Harbin China Lab. of Animal Nutrition. 1992. effect of wheat bran level on the deposition of Zn, Fe, Mn and Cu in chicken tissue. *Chinese Journal of Animal Science*. V. 28(2) P. 3-6
- FL** Li, Jinsong and Wu, Xunxian. influence of iron and copper on biological response to excess dietary zinc in chick. *Yingyang Xuebao (1992)* 14(3): 288-94 .
- Nut def** Li, Jisheng, Xu, Pengxiao, and He, Zhi. effect of zinc deficiency on apoptosis of spermatogenic cells of rat testis. *Zhonghua Yixue Zazhi (1998)* 78(2): 91-93.
- Nut def** Li, Jisheng, Xu, Pengxiao, Ren, Huiman, Hu, Haitao, and Ling, Fengdong. changes of the somatostatin and arginine vasopressin contents of the rat hippocampus in zinc deficiency.

Yingyang Xuebao (1998) 20(1): 21-24.

- FL** Li, L., Guo, Z., and Zhao, L. 1998. [effects of supplement zn on levels of zn in serum, growth hormone and hydroxyproline]. *Chung-Hua Cheng Hsing Shao Shang Wai K'o Tsa Chih* 14(6): 425-8.
- FL** Li, Li, Wu, Xunxian, and Niu, Yingdou. the preventive effect of iron, zinc and copper on chicken anemia induced by cadmium. *Yingyang Xuebao* (1991) 13(1): 39-44.
- Nut def** Li, Ligen, Guo, Zhenrong, Zhao, Lin, Chai, Jiahae, Bao, Shanfen, Li, Zhen, Tao, Cong, Han, Wenli, and Sheng, Zhijong. establishment of a rat model with zinc deficiency. *Jiefangjun Yixue Zazhi* (1998) 23(6): 412-413.
- FL** Li, Lili A, Zhang, Bin, Huang, Jianliang, Li, Haiping, and Deng, Shilin. 1999. metabolism of zinc from znmet by goats. *Yingyong Shengtai Xuebao* 10(4): 467-470.
- Phys** Li, Mingwei, Ona, V. O., Guegan, C., Chen, Minghua, Jackson Lewis, V., Andrews, L. J., Olszewski, A. J., Stieg, P. E., Lee, Jean Pyo, Przedborski, S., and Friedlander, R. M. 2000. functional role of caspase-1 and caspase-3 in an als transgenic mouse model. *Vol. 288, No. 5464, Pp. 335-339 Science* (Washington)
- FL** Li, Pingjian, Zhu, Shiya, and Goyer, Robert A. effect of experimental lead poisoning on zinc and calcium levels in rats body. *Guangdong Weiliang Yuansu Kexue* (1998) 5(4): 34-38 .
- FL** Li, Pingjian, Zhu, Shiya, and Goyer, Robert A. effect of experimental lead poisoning to zinc and calcium levels in rats body. *Zhongguo Gonggong Weisheng Xuebao* (1997) 16(5): 296-298 .
- Unrel** Li, Shi Wu, Sieron, A. L., Fertala, A., Hojima, Y., Arnold, W. V., and Prockop, D. J. 1996. the c-proteinase that processes procollagens to fibrillar collagens is identical to the protein previously identified as bone morphogenetic protein-1. *Vol. 93, No. 10, Pp. 5127-5130 Proc. Natl. Acad. Sci. Usa*
- Nut def** Li, Shimin, Zhou, Wenzhen, Guo, Zhenying, Lin, Min, and Su, Yixiang. effect of fortified iron and zinc salt on growth and development of rats. *Shipin Kexue (Beijing)* (1993) : 167, 55-7 .
- FL** Li, Wanli, Tian, Yuhui, Feng, Huigen, Tu, Baijie, Yang, Lijian, Guo, Liya, and Chen, Jian. effect of taurine and extract of cristata l. on rat plasma lipid profile and serum zn, cu, and ca. *Weisheng Yanjiu* (1998) 27(5): 341-343.
- Surv** Li WenFan, Liu ZongPing, Ma Zhou, and Wang YanPing. 1995. influences of heavy metal pollution of the environment on the health ofsheep. *Chinese Journal of Veterinary Science and Technology* 25(10): 15-17.
- FL** Li Wenli, Lu Zhinian (Nanjing Agricultural Univ. (China). Dept. of Animal Science), and Jin Suihua. 1990. effects of zinc and iodine supplementation on semen quality in dairy bulls. *Journal of Nanjing Agricultural University*. V. 13(4) P. 76-81
- CP** Li, X. and Chang, Y. H. 1995. amino-terminal protein processing in saccharomyces cerevisiae is an essential function that requires two distinct methionine aminopeptidases. *Proceedings Of The National Academy Of Sciences Of The United States Of America*. 92(26): 12357-12361.
- Unrel** Li Y-L and Et Al. the pathoanatomical and pathophysiological study on lung injury induced by activated complement in rat. *Chinese Journal of Tuberculosis and Respiratory Diseases*. 13 (3). 1990. 149-151, 190.

- Drug** Li, Yan Chun, Pirro, A. E., Amling, M., Delling, G., Baron, R., Bronson, R., and Demay, M. B. 1997. targeted ablation of the vitamin d receptor: an animal model of vitamin d-dependent rickets type ii with alopecia. *Vol. 94, No. 18, Pp. 9831-9835 Proc. Natl. Acad. Sci. Usa*
- FL** Li, Zhengyin, Zhao, Faji, Guo, Junsheng, and Li, Min. effect of different zinc level diets and heat exposure on the contents of zn, cu and fe in brain of rats. *Weisheng Yanjiu (1998) 27(5): 320-322.*
- QAC** Li, Zhengyin, Zhao, Faji, Guo, Junsheng, and Li, Min. effect of zinc on pomc mrna expression in heat-stressed rat pituitary. *Yingyang Xuebao (1998) 20(3): 294-297.*
- FL** Li Zhengyin, Zhao Faji, Guo Junsheng, and Li Min. 1997. effects of zinc on immunity and wbc apoptoses in heat-stressed rats. *Acta Nutrimenta Sinica 19(4): 388-392.*
- FL** Li, Zhenyin, Zhao, Faji, Guo, Junsheng, and Li, Min. effect of zinc on contents of zn, cu and fe in plasma, liver and adrenals of heat-exposed rats. *Yingyang Xuebao (1999) 21(3): 269-273.*
- FL** Li ZhenYin, Zhao FaJi, Guo JunSheng, and Li Min. 1999. effect of zinc on trace elements in heat exposed rats. *Acta Nutrimenta Sinica 21(3): 269-273.*
- Nut def** Liang, Yanqi and Qian, Zhiyu. effect of zinc-deficiency on the male reproductive system of rats. *Zhongguo Yaoke Daxue Xuebao (1999) 30(1): 47-50.*
- Phys** Liao, X., Du, Y., Morse, H. C. 3rd, Jenkins, N. A., and Copeland, N. G. 1997. proviral integrations at the evi5 locus disrupt a novel 90 kda protein with homology to the tre2 oncogene and cell-cycle regulatory proteins. *Oncogene 14(9): 1023-9.*
- No COC** LICHTENSTEIN, H., GUEST, G. M., and WARKANY, J. abnormalities in offspring of white rats given protamin zinc insulin during pregnancy. *PROC SOC EXP BIOL MED 78:398-402,1951*
- No Oral** Lichti, E. L., Almond, C. H., Henzel, J. H., and De, Weese M. S. 1970. differences in maternal and fetal plasma zinc levels in sheep and goats. *AMER J OBSTET GYNECOL. 106(8): 1242-1244.*
- Alt** Lichtlen, P., Georgiev, O., Schaffner, W., Aguzzi, A., and Brandner, S. 1999. the heavy metal-responsive transcription factor-1 (mtf-1) is not required for neural differentiation. *Biological Chemistry 380(6): 711-5.*
- Anat** Lichtman, J. W. the reorganization of synaptic connections in the rat submandibular ganglion during post natal development. *Journal of Physiology (London). 273 (1). 1977 155-178.*
- No COC** Lieber, C. S. and DeCarli, L. M. 1986. the feeding of ethanol in liquid diets. *Alcoholism, Clinical and Experimental Research 10(5): 550-3.*
- FL** Lienko, T. D. hygienic characteristics of trace element fertilizers (pmu-7) production dust. *Gig. Sanit. (1968) 33(1): 51-4.*
- Phys** Liew, C. C. and Cukerman, E. 1993. characterization of zn(2+)-binding nuclear proteins present in the myocardium. *Molecular and Cellular Biochemistry 121(2): 175-9.*
- Unrel** Liew Choong-Chin(A) and Cukerman Eva . 1993. characterization of zinc-binding nuclear proteins present in the myocardium. *Molecular and Cellular Biochemistry 121(2): 175-179.*
- No Oral** Liggett, W. R., Brady, J. M., Tsaknis, P. J., and Del Rio, C. E. 1980. light microscopy, scanning

electron microscopy, and microprobe analysis of bone response to zinc and nonzinc amalgam implants. *Oral Surgery, Oral Medicine, and Oral Pathology* 49(3): 254-62.

- No COC** Light, K. E., Stull, R., and Serbus, D. controlled exposure of neonatal rats to ethanol and the resultant effects on brain dopamine receptors and trace metal concentrations. *Neurol. Neurobiol.* (1984) 11B(Neurobiol. Zinc, Part B): 193-207.
- Bact** Liles, M. R., Edelstein, P. H., and Cianciotto, N. P. 1999. the prepilin peptidase is required for protein secretion by and the virulence of the intracellular pathogen legionella pneumophila. *Molecular Microbiology* 31(3): 959-70.
- CP** Lim R(A), Zaheer, Z., Kraakevik, J. A., Darby, C. J., and Oberley, L. W. 1998. effects of overexpression of gmf on cell growth and redox regulation. *FASEB Journal* 12(8): A1345.
- CP** Lim, S. and Gordon, D. T. effects of iron zinc copper interaction on growth and metallothionein concentration in fetal rat small intestinal mucosal cells ird-98. *74TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, PART II, WASHINGTON, D.C., USA, APRIL 1-5, 1990. FASEB (FED AM SOC EXP BIOL) J.* 4 (4). 1990. A1158.
- Abstract** Lim, S., Pellet, L., Stringer, B., and Gordon, D. T. interaction between iron and zinc on growth and metallothionein concentration in epithelial mucosal cells ird-98. *73RD ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, NEW ORLEANS, LOUISIANA, USA, MARCH 19-23, 1989. FASEB (FED AM SOC EXP BIOL) J.* 3 (4). 1989. A1075.
- Unrel** Lim, T. M., Lunn, E. R., Keynes, R. J., and Stern, C. D. 1987. the differing effects of occipital and trunk somites on neural development in the chick embryo. *Development* 100(3): 525-33.
- Yeast** Lima, C. and Vital, J. P. 1994. olfactory mucosa response in guinea pigs following intranasal instillation with cryptococcus neoformans. a histological and immunocytochemical study. *Mycopathologia* 126(2): 65-73.
- FL** Lima Gustavo Julio Mello Monteiro De(A), Mores Nelson, Fialho Flavio= Bello, Brito Maria Aparecida Vasconcelos Paiva E, and Gomes Paulo Cezar. 1994 . period of zinc supplementation in the diet of the performance of weaned pigs. *Revista Da Sociedade Brasileira De Zootecnia* 23(6): 949-958.
- Abstract** LIMANOWSKA, H. 1984. microscopic evaluation of biological properties of root-filling materials based on zinc oxide. *10TH BILATERAL FRIENDSHIP AND ANNIVERSARY SYMPOSIUM ON PROGRESS IN MEDICINE*
- Phys** Limson Janice and Nyokong Tebello(A) . 1997. voltammetric behavior of cysteine and metallothionein on cobalt(ii) tetrasulfonated phthalocyanine modified glassy carbon electrodes. *Electroanalysis* 9(3): 255-260.
- HHE** Lin, C. J., Wu, K. H., Yew, F. H., and Lee, T. C. 1995. differential cytotoxicity of cadmium to rat embryonic fibroblasts and human skin fibroblasts. *Toxicology and Applied Pharmacology* 133(1): 20-6.
- Diss** Lin, Chi-Wei. 1969. effects of dietary zinc on serum and tissue alkaline phosphatases of swine and rats. Avail.: Univ. Microfilms. Ann Arbor, Mich., Order No. 70-3608 From: Diss. Abstr. Int. B 1970, 31. 2. 515. 222 pp.
- FL** Lin ChungYi, Tseng HorngChih, Chen TianFwu, Pan ChingMoo, Hsieh ChiaHuey, and Wang

- ChengTaung. 1994. the effect of avoparcin, zinc bacitracin or spiramycin, added to the diets, on growth performance and tissue residues in mule ducks. *Journal of Taiwan Livestock Research* 27(4): 265-274.
- Unrel** Lin Dong, Black Stephen M, Nagahama Yoshitaka, and Miller Walter L(A). 1993. steroid 17-alpha-hydroxylase and 17,20-lyase activities of p450c17: contributions of serine-106 and p450 reductase. *Endocrinology* 132(6): 2498-2506.
- Alt** Lin, L. Y. and McCormick, C. C. parental zinc and tissue metallothionein in normal and diabetic rats. *Biological Trace Element Research*. Dec 1986. v. 11 p. 147-159.
- No COC** Lin, S. C., Hijikata, T., Saito, H., Kamei, S., Shiga, J., and Wang, C. H. 1987. serum constituents and liver photomicrographs of wild suncus murinus in the south of taiwan. *Jikken Dobutsu* 36(1): 57-63.
- CP** Lin, W. H., Lin, P. Y., Chen, M. D., Cheng, V., Tsou, C. T., Wang, Y. S., and Lin, E. 1987. effects of zinc and thyroxine treatment on dietary-obese mice. *Proceedings of the National Science Council, Republic of China. Part*
- Unrel** Lin, Wen Han, Chen, Ming Der, and Lin, Pi Yao. investigation of the profile of selected trace metals in genetically obese (ob/ob) and lean (+/?) mice. *J. Formosan Med. Assoc. (1992)* 91(Suppl. 1): S27-S33.
- No COC** Lina, B. A. R., Wilmer, J. W. G. M., Leeman, W. R., and Immel, H. R. 1986. effect of urinary acidity on the induction of rat urinary bladder proliferation by sodium saccharin or acid saccharin. *Rapp. - TNO Hoofdgroep Voeding Voedingsmiddelen TNO V 86.562/360496*, 43 pp.
- No COC** Lindenschmidt, R. C., Stone, L. C., Seymour, J. L., Anderson, R. L., Forshey, P. A., and Winrow, M. J. effects of oral administration of a high-molecular-weight crosslinked polyacrylate in rats. *Fundam. Appl. Toxicol. (1991)* 17(1): 128-35.
- Nut def** Lindsay, D. R. the usefulness to the animal producer of research findings in nutrition on reproduction. *Proceedings of the Australian Society of Animal Production*. 11. 1976 217-224
- No Oral** Lindsay Yvonne, Duthie Lesley M, and Mcardale Harry J(A). 1994. zinc levels in the rat fetal liver are not determined by transport across the placental microvillar membrane on the fetal liver plasma membrane. *Biology of Reproduction* 51(3): 358-365.
- Unrel** Lindsey, G. D. and Evans, J. 1983. evaluation of zinc phosphide for control of pocket gophers on christmas tree plantations. *Tree Planters' Notes* 34(2): 11-14.
- FL** Lindt, S. 1976. histological studies on bovine udders after treatment with a prophylactic agent. *Schweizer Archiv Fur Tierheilkunde* 118(2): 77-80.
- Nut def** Lines, D. R. 1975. letter: effects of postnatal zinc deficiency on developing rat brain. *Pediatric Research* 9(11): 850-1.
- Gene** Ling, Pei Ra, Schwartz, Joseph H., Jeevanandam, Malayappa, Gauldie, Jack, and Bistrrian, Bruce R. metabolic changes in rats during a continuous infusion of recombinant interleukin-1. *Am. J. Physiol. (1996)* 270(2, Pt. 1): E305-E312.
- No COC** Ling-yun, Q., Shu-haun, Z., Gia-xiang, W., He-Ping, Z., Xi-yun, L., Qiang, G., Zhi-kui, S., Te-fu, N., Ke-xian, Z., Sheng-rong, L., and Xin-min, H. 1984. effect of cottonseed meal on reproduction performance in boars and sows. *Acta Veterinaria Et Zootechnica Sinica* 15(3): 157-162.

- Bio Acc** Linhu Junfa, Tang Caozhong, and Liu Junping (Shanxi Agricultural Univ., Taigu China Dept. of Veterinary Medicine. 1995. relationship between contents of zinc and copper in swine tissues and environment. *Journal of Southwest Forestry College*. V. 15(2) P. 126-129
- FL** Lipovskii, S. M. 1968. [the effect of insulin and glucose on the development of ulcerous lesions in the stomach]. <original> vliianie insulina i gliukozy na vozniknovenie iazvennykh porazhenii v zheludke. *Biulleten' Eksperimental'noi Biologii i Meditsiny* 65(2): 33-6.
- Unrel** Lipschutz, Michael E., Zolensky, Michael E., and Bell, Mary Sue. new petrographic and trace element data on thermally metamorphosed carbonaceous chondrites. *Antarct. Meteorite Res.* (1999) : 12, 57-80.
- Nut def** Lisiewicz, J., Aleksandrowicz, J., Wazewska-Czyzewska, M., Sasiadek, U., Bodzon, A., Kulig, D., and Kowalczyk, K. the effect of diet poor in magnesium and zinc on lysosomal acid phosphatase activity in neutrophil granulocytes of mouse blood. *Medycyna Doswiadczalna i Mikrobiologia*. 29 (1). 1977 73-77.
- Nut def** Lisiewicz, Jerzy, Aleksandrowicz, Julian, Wazewska-Czyzewska, Maria, Sasiadek, Urszula, Bodzon, Anna, Kulig, Daniel, and Kowalczyk, Katarzyna. effect of a diet poor in magnesium and zinc on lysosomal acid phosphatase activity in neutrophil granulocytes of mouse blood. *Med. Dosw. Mikrobiol.* (1977) 29(1): 73-7.
- Unrel** Lisk, R. D., Zeiss, J., and Ciaccio, L. A. 1972. the influence of olfaction on sexual behaviour in the male goldenhamster (mesocricetus auratus). *Journal of Experimental Zoology* 181(1): 69-78.
- In Vit** Litchfield, Theresa M. and Sauer, Glenn R. metallothionein induction in calcifying growth plate cartilage chondrocytes. *Connect. Tissue Res.* (1996) 35(1-4): 189-195.
- Abstract** Littledike, E. T., Wittum, T. W., and Jenkins, T. G. 1994. relationships between body composition and liver and serum copper and zinc in mature cows representing nine breeds of cattle. *Journal of Dairy Science* 77(SUPPL. 1): 131.
- Plant** Liu Donghua(A), Jiang Wusheng(A), and Li Deshen. 1993. effects of aluminium ion on root growth, cell division, and nucleoli of garlic (allium sativum l.). *Environmental Pollution* 82(3): 295-299.
- CP** Liu, F. T. and Lin, H. S. 1969. relationship between insulin and growth hormone in growth and development of rat submandibular glands. *Proceedings of the Society for Experimental Biology and Medicine*; 131
- No COC** Liu, F. T. Y. and Sayegh, F. S. role of insulin in mandibular growth and development. *Proceedings of the Society for Experimental Biology and Medicine*. 167 (4). 1981. 547-550.
- Nut def** Liu, Hueyjiuan, Oteiza, Patricia I., Gershwin, M. Eric, Golub, Mari S., and Keen, Carl L. effects of maternal marginal zinc deficiency on myelin protein profiles in the suckling rat and infant rhesus monkey. *Biol. Trace Elem. Res.* (1992) 34(1): 55-66
- No Oral** Liu, J., Liu, Y., Hartley, D., Klaassen, C. D., Shehin-Johnson, S. E., Lucas, A., and Cohen, S. D. 1999. metallothionein-i/ii knockout mice are sensitive to acetaminophen-induced hepatotoxicity. *Journal of Pharmacology and Experimental Therapeutics* 289(1): 580-6.
- FL** Liu, J. F., Pei, Y. Q., Wang, Z. D., Xu, J. G., Lei, X. P., and Ling, Y. Z. 1994. [studies on the anticonvulsive activity of pyrazolidinones]. [*Yao Hsueh Hsueh Pao*] 29(3): 166-70.

- Nut def** Liu, J. Y. and Stemmer, K. L. 1990. interaction of aluminum with zinc and copper and its effects on pituitary-testicular axis: a histological study. *Biomedical and Environmental Sciences* 3(1): 1-10.
- CP** Liu, Jianye and Stemmer, Klaus L. 1983. the interaction of aluminum with certain essential metals and its influence upon the pituitary-testicular axis. *Heavy Met. Environ. Int. Conf.*, 4th 1: 442-6 Publisher: CEP Consult., Edinburgh, UK.
- OAC** Liu Jinmin Et@Al. 1996. the effect of ultrasonic radiation on the blood biologic chemical parameters of pregnant rat and the trace element of their offsprings. *Zhongguo Chaosheng Yixue Zazhi* 12(3): 12-15.
- OAC** Liu Jinmin Et@Al. 1996. research of the effect of diagnostic ultrasound wave on the growth of mice fetus. *Zhongguo Chaosheng Yixue Zazhi* 12(1): 7-9.
- CP** Liu Margaret K, Su Ming-Tsan, Lyons Gary, Chen Zhi, Izumo Seigo, and Bodmer Rolf. 1998. characterization of the mouse zfh-1, a zinc-finger containing homeodomain protein. *Journal of Molecular and Cellular Cardiology* 30(7): A248.
- No Oral** Liu, Nianqing, Ji, Yunjing, Wang, Min, Zhang, Xiaofeng, Yan, Lingna, Li, Jianlin, Jin, Feng, Feng, Songlin, and Zhong, Ming. the metabolism of titanium and other elements in wister rats. *Nucl. Sci. Tech.* (1991) 2(3): 178-83.
- No Oral** Liu, Nianqing, Zhang, Xiaofeng, Yan, Lingna, Feng, Songlin, Zhong, Ming, Ji, Yunjing, Wang, Min, Li, Jianlin, and Jin, Feng. pixe study on the variations of concentration of titanium and other elements in wister rats after titanium ascorbate administration. *Hejishu* (1992) 15(4): 251-6 .
- CP** Liu, Q., Segal, D. J., Ghiara, J. B., and Barbas, C. F. 3rd. 1997. design of polydactyl zinc-finger proteins for unique addressing within complex genomes. *Proceedings of the National Academy of Sciences of the United States of*
- Gene** Liu, Q., Shalaby, F., Puri, M. C., Tang, S., and Breitman, M. L. 1994. novel zinc finger proteins that interact with the mouse gamma f-crystallin promoter and are expressed in the sclerotome during early somitogenesis. *Developmental Biology* 165(1): 165-77.
- Unrel** Liu, S. T., Howlett, G., and Barrow, C. J. 1999. histidine-13 is a crucial residue in the zinc ion-induced aggregation of the a beta peptide of alzheimer's disease. *Biochemistry* 38(29): 9373-8.
- No Oral** LIU-SHENG, H., XIO-SHAN, Y., and DE-CHANG, W. age-dependent variation of zinc-65 metabolism in laca mice. *INT J RADIAT BIOL*; 60 (6). 1991. 907-916.
- FL** Liu, Shugang, Kong, Xiangying, Zuo, Lianfu, and Guo, Jianwen. cell analysis of effect of zinc on young rat brain development and mt expression. *Yingyang Xuebao* (1998) 20(2): 163-167.
- FL** Liu, Shugang, Kong, Xiangying, Zuo, Lianfu, and Guo, Jianwen. effects of zinc on metallothionein expression in the brain in young rats. *Di-San Junyi Daxue Xuebao* (1997) 19(4): 352-355 .
- No Oral** Liu, Tao, Walker, Judith S., and Tracey, David J. zinc alleviates thermal hyperalgesia due to partial nerve injury. *NeuroReport* (1999) 10(3): 645-649.
- Gene** Liu, Wei, Hillmann, A. G., and Harmon, J. M. 1995. hormone-independent repression of ap-1-inducible collagenase promoter activity by glucocorticoid receptors. *Mol. Cell. Biol.* 15(2): 1005-1013.

- Nut def** Liu, Xing Wang, Dejima, Yasushi, Suzuki, Tsuguyoshi, Himeno, Seiichiro, and Okazaki, Yoichi. marginal zinc deficiency and changes in behavioral salt taste threshold and salt preference in mice. *J. Nutr. Sci. Vitaminol.* (1991) 37(2): 185-99.
- Nut def** Liu, Xu-Nian and Viteri, Fernando E. effects of iron nutritional status and iron and zinc intakes on their absorption and interaction in the rat. *Zhongguo Bingli Shengli Zazhi* (1995) 11(6): 619-23
- FL** Liu Yanqiang (Nanjing Agricultural Univ. (China). Dept. of Veterinary Science). 1994. effect of dietary calcium and zinc levels on gains, body condition and mineral contents in tissues of beijing white chicken. *Acta Zoonutrimenta Sinica.* V. 6(1) P. 33-38
- Nut def** Liu, Yanqing, Cheng, Yiyong, Shi, Ming, Wang, Donglan, Li, Shutian, and Gu, Jingfan. study of different reactivity of zinc deficient rat to light and electricity and the mechanism involved. *Yinyang Xuebao* (1998) 20(3): 299-302.
- Gene** Liu, Yongliang, Oakeley, E. J., Sun, L., and Jost, J. P. 1998. multiple domains are involved in the targeting of the mouse dna methyltransferase to the dna replication foci. *Vol. 26, No. 4, Pp. 1038-1045* Nucleic Acids Res.
- Nut def** Livingston, D. M. and Wacker, W. E. 1971. trace metal methods for nutritional studies. *American Journal of Clinical Nutrition* 24(9): 1082-5.
- Nut** Lizama, L. C., McDowell, L. R., and Marion, J. E. 1989. utilization of aquatic plants elodea canadensis and hydrillaverticillata in laying hen diets. 2. macrominerals and microminerals. *Nutrition Reports International* 39(3): 521-536.
- In Vit** Lizard Gerard(A), Deckert Valerie, Dubrez Laurence, Moisan Maryvonne, Gambert Philippe, and Lagrost Laurent. 1996. induction of apoptosis in endothelial cells treated with cholesterol oxides. *American Journal of Pathology* 148(5): 1625-1638.
- FL** Lizohub, M. L. Crimean State Agricultural Univ. Simferopol Ukraine. 1997. [activating immunofunctions of gamma-globulines of the blood serum of neonatal calves with the addition of copper and zinc in the ration of pregnant cows]. <original> aktivatsiya immunnukh funktsiyi gamma-globulinov syvorotki krovi novorozhdyennykh tyelyat pri dobavlyeniyi v ratsion styel'nykh korov myedi i tsynka. 146 P.
- Bio Acc** Llacuna, S., Gorriz, A., Sanpera, C., and Nadal, J. 1995. metal accumulation in three species of passerine birds (emberiza cia, parus major, and turdus merula) subjected to air pollution from a coal-fired power plant. *Arch Environ Contamin Toxicol* . 28(3): 298-303.
- Mix** Llewellyn, G. C., Hastings, C. E. Jr, and Hofman, J. W. bio interaction of aflatoxin and zinc in mongolian gerbils meriones-unguiculatus. *Toxicon.* 18 (1). 1980. 107-112.
- BioX** Llewellyn, G. C., Hoke, G. D., O'Rear, C. E., Mayfield, J. E., and Dashek, W. V. alteration of some toxic aflatoxin responses in syrian hamsters fed zinc carbonate-supplemented diets. *J. Ind. Microbiol.* (1986) 1(1): 1-8 .
- BioX** Llewellyn, Gerald C., Floyd, Elizabeth A. , Hoke, Glenn D., Weekley, L. Bruce, and Kimbrough, T. Daniel. influence of dietary aflatoxin, zinc, and copper on bone size, organ weight, and body weight in hamsters and rats. *Bull. Environ. Contam. Toxicol.* (1985) 35(2): 149-56.
- FL** LLOBET, J. M., DOMINGO, J. L., COLOMINA, M. T., PATERNAIN, J. L., and CORBELLA, J. toxicity of orally administered zinc in rats. *REV SANID HIG PUBLICA*; 62 (1-4). 1988. 1439-1446.

- Acu** Lloris, J. M., Esplugues, J. V., Sarria, B., Calvo, M. A., Marti-Cabrera, M., Marti-Bonmati, E., and Esplugues, J. effects of zinc sulfate on gastric mucosal blood flow and gastric emptying of the rat. *J. Pharm. Pharmacol.* (1988) 40(1): 60-1 .
- Meth** Lloyd, J. B. and Weston, N. T. 1982. a spectrometric study of the fluorescence detection of fecal urobilinoids. *Journal of Forensic Sciences* 27(2): 352-65.
- Prim** Lloyd, J. M., Seale, N. S., and Wilson, C. F. G. the effects of various concentrations and lengths of application of glutaraldehyde on monkey pulp tissue. *Pediatric Dentistry.* 10 (2). 1988. 115-120.
- No Org** Lloyd, J. W., Rook, J. S., Braselton, E., and Shea, M. E. 2000. use of a non-linear spline regression to model time-varying fluctuations in mammary-secretion element concentrations of periparturient mares in michigan, usa. *Preventive Veterinary Medicine* 43(3): 211-222.
- Acu** Lo, G. S., Settle, S. L., Steinke, F. H. , and Hopkins, D. T. effect of phytate zinc molar ratio and isolated soybean protein on zinc bio availability. *J NUTR. Journal of Nutrition.* 111 (12). 1981. 2223-2235.
- Nut def** Lo, Grace S., Settle, Steve L., Steinke, Fred H., and Hopkins, Daniel T. effect of phytate:zinc molar ratio and isolated soybean protein on zinc bioavailability. *J. Nutr.* (1981) 111(12): 2223-35 .
- Acu** Lo, Grace S., Steinke, Fred H., Ting, Bill T. G., Janghorbani, Morteza, and Young, Vernon R. comparative measurement of zinc absorption in rats with stable isotope zinc-70 and radioisotope zinc-65. *J. Nutr.* (1981) 111(12): 2236-9 .
- CP** Lobe, C. G., Gruss, P., and <Editors> Mahowald, A. P. 1989. mouse relatives of drosophila developmental control genes. <document title>genetics of pattern formation and growth control. 223-235.
- Aquatic** Lobel, P. B. 1987. inherent variability in the ratio of zinc to other elements in the kidney of the mussel mytilus-edulis. *Comparative Biochemistry And Physiology C-Comparative Pharmacology And Toxicology* 87(1): 47-50.
- In Vit** LOBNER, D., GOTTRON, F., YING, H., TIAN, M., DUGAN, L. L., KNUDSON, C. M., KORSMEYER, S. J., and CHOI, D. W. 1997. zinc-induced neuronal apoptosis on necrosis in cortical culture. *27TH ANNUAL MEETING OF THE SOCIETY FOR NEUROSCIENCE*
- Bio Acc** Lock, J. W., Thompson, D. R., Furness, R. W., and Bartle, J. A. metal concentrations in seabirds of the new zealand region. *Environ. Pollut.* (1991) Volume Date 1992, 75(3): 289-300.
- Gene** Locke, J., Podemski, L., Roy, K., Pilgrim, D., and Hodgetts, R. 1999. analysis of two cosmid clones from chromosome 4 of drosophila melanogaster reveals two new genes amid an unusual arrangement of repeated sequences. *Genome Research* 9(2): 137-49 .
- No Oral** Lockitch, G., Godolphin, W., Pendray, M. R., Riddell, D., and Quigley, G. 1983. serum zinc, copper, retinol-binding protein, pre-albumin, and ceruloplasmin concentrations in infants receiving intravenous zinc and copper supplementation. *Journal Of Pediatrics* 102(2): 304-308.
- No COC** Loennerdal, Bo, Sandberg, Ann Sofi, Sandstroem, Brittmarie, and Kunz, Clemens. inhibitory effects of phytic acid and other inositol phosphates on zinc and calcium absorption in suckling rats. *J. Nutr.* (1989) 119(2): 211-14 .
- Surv** Loganathan, P., Mackay, A. D., Lee, J., and Hedley, M. J. 1995. cadmium distribution in hill

pastures as influenced by 20 years of phosphate fertilizer application and sheep grazing. *Australian Journal of Soil Research* 33(5): 859-871.

- Bio Acc** Logas, D., Kunkle, G. A., and McDowell, L. 1993. comparison of serum zinc levels in healthy, systemically ill and dermatologically diseased dogs. *Veterinary Dermatology*. 4(2): 61-64.
- Abstract** Login, I. S. and Macleod, R. M. a direct inhibitory effect of zinc on pituitary prolactin secretion. *33RD ANNUAL MEETING PROGRAM OF THE AMERICAN ACADEMY OF NEUROLOGY, TORONTO, ONT., CANADA, APRIL 27-MAY 2, 1981. NEUROLOGY*. 31 (4 Part 2). 1981. 150-151.
- Mineral** Lohi, O., Rasmussen, P. V., and Jensen, L. V. 1991. production of mink. 3. mineral content of feed and hair on microscopic studies on hair. <document title>beretning fra statens husdyrbrugsforsøg. (688): 97-130.
- No COC** Lohnert, H. J. and Ochrimenko, W. I. 1995. use of growth promoters produces better rearing results. *Neue Landwirtschaft* (3): 62-63.
- Bact** Lohuis, J. A. C. M., Van Leeuwen W, Verheijden, J. H. M., Brand, A., and Van Miert A Sj. P. A. M. effect of steroidal anti-inflammatory drugs on escherichia-coli endotoxin-induced mastitis in the cow. *Journal of Dairy Science*. 72 (1). 1989. 241-249.
- No Oral** LOHUIS, J. A CM, VERHEIJDEN, J. HM, BURVENICH, C., and VAN MIERT A S J P AM. pathophysiological effects of endotoxins in ruminants 2. metabolic aspects. *VET Q*; 10 (2). 1988. 117-125.
- Nut def** Loipfuehrer, A. M., Reichlmayr-Lais, A. M., and Kirchgessner, M. concentration of free calcium in erythrocytes and liver mitochondria of zinc-depleted rats. *J. Trace Elem. Electrolytes Health Dis.* (1992) 6(4): 223-6.
- Nut def** Lokken, P. M., Halas, E. S., and Sandstead, H. H. 1973. influence of zinc deficiency on behavior. *Proceedings of the Society for Experimental Biology and Medicine*; 144
- Nut def** Lokken, Paige M., Halas, Edward S., and Sandstead, Harold H. influence of zinc deficiency on behavior. *Proc. Soc. Exp. Biol. Med.* (1973) 144(2): 680-2.
- Nut** Lombardini, J. B. and Medina, E. V. effects of dietary inorganic sulfate taurine and methionine on tissue levels of taurine in the growing rat. *Journal of Nutrition*. 108 (3). 1978 428-433.
- HHE** Lombeck, I., Alzubaidy, I. M., Kasperek, K., Feinendegen, L. E., and Bremer, H. J. 1983. zinc status of libyan children - a pilot-study. *Zeitschrift Fur Ernährungswissenschaft* 22(1): 1-5.
- Drug** Long, Fei and Peng, Shusheng. influence of refined konjac meal on the absorption of dietary zinc, iron and calcium. *Yingyang Xuebao* (1993) 15(1): 73-7.
- FL** Long Fei(A) and Peng Shusheng. 1993. influence of refined konjac meal on the absorption of dietary zinc, iron and calcium. *Acta Nutrimenta Sinica* 15(1): 73-78.
- No Dur** Longcore, J. R., Samson, F. B., Kreitzer, J. F., and Spann, J. W. 1971. changes in mineral composition of eggshells from black ducks and mallards fed dde in the diet. *Bull Environ Contam Toxicol*. 6(4): 345-50.
- CP** Lonnerdal, B. lactation in the dog and cat. *Recent Advances In Canine And Feline Nutritional Research : Proceedings Of The 1996 Iams International Nutrition Symposium* / p. 79-87.

- Prim** Lonnerdal, B., Bell, J. G., Hendrickx, A. G., Burns, R. A., and Keen, C. L. effect of phytate removal on zinc absorption from soy formula. *American Journal Of Clinical Nutrition*. Nov 1988. v. 48 (5) p. 1301-1306. charts.
- Prim** Lonnerdal, B., Keen, C. L., Bell, J. G., Golub, M. S., Hendrickx, A. G., and Gershwin, M. E. 1990. effect of marginal maternal zinc intake on zinc absorption and growth of 3-month-old infant rhesus monkeys. *American Journal of Diseases of Children* 144(9): 1007-10.
- Prim** Lonnerdal, B., Keen, C. L., Hendrickx, A. G., Golub, M. S., and Gershwin, M. E. the influence of dietary zinc and iron on zinc absorption-retention in pregnant rhesus monkeys and their infants. *73RD ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, NEW ORLEANS, LOUISIANA, USA, MARCH 19-23, 1989. FASEB (FED AM SOC EXP BIOL) J.* 3 (3). 1989. A456.
- Prim** Lonnerdal, B., Keen, C. L., Hendrickx, A. G., Golub, M. S., and Gershwin, M. E. 1990. influence of dietary zinc and iron on zinc retention in pregnant rhesus monkeys and their infants. *Obstetrics and Gynecology* 75(3 Pt 1): 369-74.
- In Vit** Lonnerdal, B., Keen, C. L., Reinstein, N., and Hurley, L. S. 1982. effects of varying dietary zinc and copper levels during pregnancy in the rat. *Clinical Research* 30: A623.
- CP** Lonnerdal B(A), Jayawickama, L., and Lien, E. L. 1996. effect of low phytate soy formula on zinc and copper absorption. *FASEB Journal* 10(3): A818.
- No Control** Lonnerdal, B. Davidson L. and Keen C. L. 1985. effect of varying dietary iron and zinc levels on tissue concentrations in the rat. *Nutr.Res. Suppl.I*: 277-280.
- Nut def** Looney, M. A. and Lei, K. Y. dietary fiber, zinc and copper: effects on serum and liver cholesterol levels in the rat. *Nutr. Rep. Int. (1978)* 17(3): 329-37.
- CP** Looney, M. A., Lei, K. Y., and Kilgore, L. T. 1977. effect of dietary fiber, zinc and copper on serum and liver levels in rat. *Federation Proceedings* 36: 1134.
- Unrel** Loos-Frank, B. the weasel mustela-nivalis helps in detecting demodex mites in rodents. *Experimental & Applied Acarology.* 4 (2). 1988. 179-180.
- Drug** LoPachin, R. M., Weiler, M. S., Williams, K. D., and Peterson, R. E. 1984. evaluation of the ability of d-penicillamine to protect rats against the neurotoxicity induced by zinc pyridinethione, acrylamide, 2,5-hexanedione and p-bromophenylacetylurea. *Neurotoxicology* 5(2): 37-41.
- Drug** Lopachin, R. M., Weiler, M. S., Williams, K. D., and Peterson, R. E. evaluation of the ability of dextro penicillamine to protect rats against the neurotoxicity induced by zinc pyridinethione acrylamide 2 5 hexanedione and p bromophenylacetylurea. *NEUROTOXICOLOGY (Little Rock).* 5 (2). 1984. 37-42.
- Rev** Lopachin Richard M(A). 2000. redefining toxic distal axonopathies. *Toxicology Letters (Shannon)* (112-113): 23-33.
- Herp** Lopez-Garcia, C., Martinez-Guijarro, F. J., Berbel, P., and Garcia-Verdugo, J. M. 1988. long-spined polymorphic neurons of the medial cortex of lizards: a golgi, timm, and electron-microscopic study. *Journal of Comparative Neurology* 272(3): 409-23.
- Abstract** Lopez, H., Isbell, P., Anderson, J. , and Navia, J. M. the metabolism of zinc during bone fracture healing. *J DENT RES. Journal of Dental Research.* 52 (Spec Issue). 1973 82

- No Dose** Lopez, Hubert W., Coudray, Charles, Bellanger, Jacques, Younes, Hassan, Demigne, Christian, and Remesy, Christian. intestinal fermentation lessens the inhibitory effects of phytic acid on mineral utilization in rats. *J. Nutr.* (1998) 128(7): 1192-1198.
- Nut def** Lopez V(A), Clegg, M. S., Globus, R. K., and Keen, C. L. 1998. zinc deficiency induces apoptosis in primary rat osteoblasts. *FASEB Journal* 12(4): A346.
- No COC** Losch, U. and Ladanyi, S. 1972. occurrence of microbiologically active inhibitory substances in meat and organs of zinc bacitracin-fed slaughter animals. *Schlacht- Und Viehhof-Zeitung* 72(10): 362-363.
- HHE** Lostroh, A. J. diabetogenic hormones human chorio somatomammotropin and ovine growth hormone anti insulin action in hypophysectomized rats. *Acta Endocrinologica.* 77 (1). 1974 96-102.
- Nut def** Lotfian, M. H. and Hasan, M. 1991. effects of perturbation of zinc levels in various regions of the developing rat brain. *International Journal of Toxicology*
- Gene** Louis, H. A., Pino, J. D., Schmeichel, K. L., Pomies, P., and Beckerle, M. C. 1997. comparison of three members of the cysteine-rich protein family reveals functional conservation and divergent patterns of gene expression. *Journal of Biological Chemistry* 272(43): 27484-91.
- No Oral** LOVE, E. J., KINCH, R. A., and STEVENSON, J. A. effect of protamine zinc insulin on the outcome of pregnancy in the normal rat. *DIABETES* 13:44-48,1964
- Unrel** Lovell, Mark A., Xie, Chengsong, and Markesbery, William R. protection against amyloid beta peptide toxicity by zinc. *Brain Res.* (1999) 823(1,2): 88-95.
- FL** Low, O. and Machnik, G. 1974. [morphometry of endocrine organs. 2. karyometry of dog and swine thyroid glands following administration of turisynchron and suisynchron]. <original> morphometrie an indokrinen organen. ii. karyometrie an schilddrusen von hunden und schweinen nach applikation von turisynchron und suisynchron. *Archiv Fur Experimentelle Veterinarmedizin* 28(5): 725-30.
- FL** Low, O. and Machnik, G. 1974. (morphometry of endocrine organs. ii. caryometric studies on the thyroid gland of dogs and pigs after administration of turisynchron and suisynchron). *Archiv Fur Experimentelle Veterinarmedizin* 28(Heft 5): 725-730.
- CP** Lowe, J. A(A), Wiseman, J., and <Book> British Society Of Animal Science. 1997. the effect of the source of dietary supplemental zinc on tissue copper concentrations in the rat. <book> proceedings of the british society of animal science, 1997. 67.
- Fate** Lowe, N. M., Bremner, I., and Jackson, M. J. 1991. plasma ⁶⁵zn kinetics in the rat. *The British Journal Of Nutrition.* 65(3): 445-455.
- No Oral** Lowe, N. M., Bremner, I., and Jackson, M. J. plasma zinc-65 kinetics in the rat. *Br. J. Nutr.* (1991) 65(3): 445-55.
- CP** Lowe, N. M., Woodhouse, L. R., King, J. C., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. short term zinc kinetics during pregnancy in the rat: the effect of a marginally zinc deficient diet. <document title> trace elements in man and animals - tema 8: proceedings of the eighth international symposium on trace elements in man and animals. 1114-1117.
- Nut** Lowe, Nicola M., Woodhouse, Leslie R., Wee, Jennifer, and King, Janet C. short-term zinc kinetics in pregnant rats fed marginal zinc diets. *J. Nutr.* (1999) 129(5): 1020-1025.

- Nut def** Lowney, P., Gershwin, M. E., Hurley, L. S., Stern, J. S., and Keen, C. L. 1988. the effect of variable magnesium intake on potential factors influencing endurance capacity. *Biological Trace Element Research* 16(1): 1-18.
- No Dose** Loyke, H. F. 1991. copper and zinc in experimental hypertension. *Biological Trace Element Research*. 29(1): 45-49.
- FL** Lu GuangZhou, Lu ZhiNian, and Ding XiaoMing. 1995. effect of oral supplemental zinc on calves around weaning. *Acta Veterinaria Et Zootechnica Sinica* 26(3): 207-213.
- CP** Lu, J. and Combs, G. F. Jr. effects of excess dietary zinc on starch digestibility and amylase activity of chicks. *75TH ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC. POULT SCI.* 65 (Suppl. 1). 1986. 83.
- CP** Lu, J. and Combs, G. F. Jr. excess dietary zinc decreases pancreatic amylase synthesis in the chick. *78TH ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC. POULT SCI.* 68 (Suppl. 1). 1989. 88.
- CP** Lu, J., Combs, G. F. Jr, and Fleet, J. C. the kinetic response pattern of chick pancreas to excess dietary zinc. *72ND ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, LAS VEGAS, NEVADA, USA, MAY 1-5, 1988. FASEB (FED AM SOC EXP BIOL) J.* 2 (4). 1988. Abstract 3310.
- Phys** Lu, J. X. and Combs, G. F. 1988. excess dietary zinc decreases tissue alpha-tocopherol in chicks. *Journal Of Nutrition* 118(11): 1349-1359.
- CP** Lu, Junxuan and Combs, G. F. Jr. inhibition of pancreatic exocrine function by high levels of dietary zinc. *Proc. - Cornell Nutr. Conf. Feed Manuf. (1986)* 52-6
- CP** Lu, K. S., Chiang, H. N., and Lin, H. S. 1987. fine structural and cytochemical studies on the hamster subcommissural organ. *Proceedings of the National Science Council, Republic of China. Part*
- Gene** Lu, T. Hong, Pepe, J., Lambrecht, R. W., and Bonkovsky, H. L(A). 1996. regulation of metallothionein gene expression. studies in transfected primary cultures of chick embryo liver cells. *Biochimie (Paris)* 78(4): 236-244.
- No Oral** Lucis, Ojars J., Lucis, Ruta, and Shaikh, Zahir A. cadmium and zinc in pregnancy and lactation. *Arch. Environ. Health (1972)* 25(1): 14-22 .
- Phys** Luckman, S. M. 1995. stimulus-specific expression of inducible transcription factors in identified oxytocin neurones. *Advances in Experimental Medicine and Biology* 395: 37-48.
- Mix** Ludany, A., Kellermayer, M., and Jobst, K. 1981. low-molecular-weight zinc-binding proteins in liver cytosol of the allylisopropylacetamide (aia) treated rats. *Acta Biochimica Polonica* 28(3-4): 207-12.
- Phys** Ludwig, J. C. and Chvapil, M. 1980. reversible stabilization of liver lysosomes by zinc ions. *Journal of Nutrition* 110(5): 945-53.
- In Vit** Ludwig, Janet C. and Chvapil, Milos. reversible stabilization of liver lysosomes by zinc ions. *J. Nutr. (1980)* 110(5): 945-53.
- Rev** Luecke, R. W. 1984. domestic animals in the elucidation of zinc's role in nutrition. *Federation Proceedings* 43(13): 2823-8.

- CP** Luecke, R. W., Baltzer, Betty V., and Whitenack, D. L. 1974. effect of supplementary lysozyme on zinc deficiency in the rat. *Trace Elem. Metab. Anim. Proc. Int. Symp., 2nd* : Meeting Date 1973, 739-41. Editor(s): Hoekstra, W. G. Publisher: Univ. Park Press, Baltimore, Md..
- CP** Luecke, R. W. and Fraker, P. J. the effect of dietary restriction and zinc intake on the antibodymediated response of a/j mice. *Federation Proceedings*| SN- 0014-9446| PY- 1978| VO- 37| IS- 3| PG- (VV120); *Animal Nutrition (Physiology)* (LL510)
- HHE** Luecke, R. W. and Fraker, P. J. the effect of varying dietary zinc levels on growth and immunity instrains of mice. *Federation Proceedings*| SN- 0014-9446| PY- 1979| VO- 38| IS- 3, I| PG- (HH600); *Human Physiology & Biochemistry* (VV050)
- CP** Luecke, R. W., Ruksan, B. E., and Baltzer, B. V. the zinc content of blood serum and bone as indices of dietary zinc adequacy in the rat. *MILLS, C. F. (EDITED BY). TRACE ELEMENT METABOLISM IN ANIMALS. PROCEEDINGS OF A WORLD ASSOCIATION FOR ANIMAL PRODUCTION INTERNATIONAL BIOLOGICAL PROGRAMME SYMPOSIUM. XXV + 549P. ILLUS. E. AND S. LIVINGSTONE, PUBLISHERS: EDINBURGH, GREAT BRITAIN. 1970 471-473*
- CP** Luecke, R. W., Ruksan, Bruna E., and Baltzer, Betty V. 1970. zinc content of blood serum and bone as indexes of dietary zinc adequacy in the rat. *Trace Elem. Metab. Anim. Proc. WAAP World Ass. Anim. Prod./IBP (Int. Biol. Progr.) Int. Symp.* Meeting Date 1969, 471-3. Editor(s): Mills, Colin F. Publisher: Livingstone, London, Engl..
- IMM** Luecke, Richard W. and Fraker, Pamela J. the effect of varying dietary zinc levels on growth and antibody-mediated response in two strains of mice. *J. Nutr.* (1979) 109(8): 1373-6 .
- Nut def** Luecke, Richard W., Simonel, Charles E., and Fraker, Pamela J. the effect of restricted dietary intake on the antibody mediated response of the zinc deficient a/j mouse. *J. Nutr.* (1978) 108(5): 881-7
- Abstract** Luhrsens, K. R. and Rotruck, J. T. comparative studies with weanling rats to measure zinc bio availability from soy protein isolate and beef. *Federation Proceedings.* 38 (3 Part 1). 1979 558
- CP** Lui, E. M. K. hepatic and renal trace metals of guinea-pigs during peri natal development. *JOINT MEETING OF THE ROCHESTER CONFERENCE AND THE SCIENTIFIC COMMITTEE (PCIAOH) ON THE TOXICOLOGY OF METALS ON REPRODUCTIVE AND DEVELOPMENTAL TOXICITY OF METALS, ROCHESTER, N.Y., USA, MAY 24-27, 1982. TERATOLOGY.* 26 (1). 1982. 49a.
- Nut def** Lui, E. M. K. 1987. metabolism of copper and zinc in the liver and bone of the perinatal guinea pig. *Comp. Biochem. Physiol. C: Comp. Pharmacol. Toxicol.* 86C(1): 173-83
- CP** Luis, A. M. B., Luis, E. S. Philippines Univ. Los Banos College Laguna Philippines Inst. of Animal Science, Sarabia, A. S., Cordova, E. D., Luis, E. S., and Momongan, V. G. eds. 1996. zeolite, zinc bacitracin and virginiamycin in layer diets. recent developments in animal production: proceedings of the 2nd asian buffalo association congress. 315 P. P. 116-126
- Mix** Lukaski, H. C., Bolonchuk, W. W., Klevay, L. M., Milne, D. B., and Sandstead, H. H. 1983. maximal oxygen-consumption as related to magnesium, copper, and zinc nutriture. *American Journal Of Clinical Nutrition* 37(3): 407-415.
- Nut def** Lukaski, H. C., Hall, C. B., and Marchello, M. J. impaired thyroid hormone status and thermoregulation during cold exposure of zinc-deficient rats. *Horm. Metab. Res.* (1992) 24(8): 363-6.

- HHE** Lukaski, H. C., Hoverson, B. S., Milne, D. B., and Bolonchuk, W. W. 1989. copper, zinc, and iron status of female swimmers. *Nutrition Research* 9(5): 493-502.
- Meth** Lukaski, H. C., Lykken, G. I., and Klevay, L. M. simultaneous determination of copper, iron, and zinc absorption using gamma ray spectroscopy: fat effects. *Nutr. Rep. Int.* (1986) 33(1): 139-46.
- In Vit** Lumeng, L. and Li, T. K. 1975. characterization of the pyridoxal 5'-phosphate and pyridoxamine 5'-phosphate hydrolase activity in rat liver. identity with alkaline phosphatase. *Journal of Biological Chemistry* 250(20): 8126-31.
- No COC** Lund, S. effect of antibiotics and enzymes in broiler. *NOR LANDBRUKFORSKING*. 1 (2). 1987. 65-74.
- FL** Lunden, A., Lindqvist, A, Frank, A., and Petersson, L. R. 1988. cobalt and copper levels in slaughtered lambs. *Svensk Veterinartidning* 40(5): 266-272.
- In Vit** LUNDHOLM, C. E. and MATHSON, K. 1986. effect of some metal compounds on the calcium binding and calcium-magnesium atpase activity of eggshell gland mucosa homogenate from the domestic fowl. *ACTA PHARMACOL TOXICOL* 59 (5): 410-415.
- Nut def** Luo, C. H., Chen, J., Yang, X. J., Li, Y. Q., Xu, B., Zheng, D. Y., and Qian, Y. Q. 1989. [influence of zinc deprivation on thymus, spleen development and adenosine deaminase activity in young rats]. *Hua Hsi i K'o Ta Hsueh Hsueh Pao* 20(2): 199-202.
- Nut def** Luo, Chunhua, Chen, Jing, Yang, Xianjun, Li, Yuqi, Xu, Bo, Zheng, Deyuan, and Qian, Youqiong. influence of zinc deprivation on thymus, spleen development and adenosine deaminase activity in young rats. *Huaxi Yike Daxue Xuebao* (1989) 20(2): 199-202.
- Nut** Luo, L., Tong, J. M., and Huang, J. C. 1992. effects of dietary chloride and magnesium on the incidence of tibial dyschondroplasia in chickens fed on chinese practical diets. *British Poultry Science* 33(3): 603-11.
- FL** Luo, X. G., Su, Q., Huang, J. C., Duan, Y. Q., and Liu, J. X. 1992. the long-term effects of manganese deficiency or excess in diets on the performances of broiler chicks. *Chinese Journal of Animal Science* 28(1): 11-13.
- FL** Luo Xugang, Su Qi, and Huang Junchun (Chinese Academy of Agricultural Sciences, Beijing China Inst. of Animal Sciences. 1991. the effects of manganese (mn) deficiency and excess in a practical diet on contents of other minerals and trace elements in tissues of broiler chicks. *Animal Husbandry and Veterinary Medicine*. V. 23(4) P. 146-147
- FL** Luo Zhi-Bin(A), Wu Jia-Hui, Shi Jing-Quan, and Xu Cai-Pu(A). 2000. effects of zinc-excess on immunity of intestinal mucosa in rats. *Zhongguo Yaolixue Yu Dulixue Zazhi* 14(1): 36-39.
- Nut def** Luo, Zhibin and Wu, Jiahua. effects of zinc-deficiency on mucus secretion of intestinal mucosa in rats. *Yingyang Xuebao* (1998) 20(3): 308-311.
- FL** LUO ZHIBIN, WU JIAHUI, SHI JINGQUAN, and XU CAIPU. effects of zinc poisoning on the ultrastructure of intestinal mucosa in rats. *ACTA NUTRIMENTA SINICA*; 21 (1). 1999. 34-37.
- Alt** Luoh, S. W., Bain, P. A., Polakiewicz, R. D., Goodheart, M. L., Gardner, H., Jaenisch, R., and Page, D. C. 1997. zfx mutation results in small animal size and reduced germ cell number in male and female mice. *Development* 124(11): 2275-84.

- Unrel** Luoma, H., Seppa, L., Koskinen, M., and Syrjanen, S. effect of chlorhexidine-fluoride applications without and with strontium and zinc on caries, plaque, and gingiva in rats. *J. Dent. Res.* (1984) 63(10): 1193-6.
- Nut def** Lush, J. M. Adelaide Univ. Glen Osmond Australia Dept. of Animal Sciences and Mercer, J. R. ed. 1988. the effect of zinc deficiency on wool growth [sheep]. [conference paper]. proceedings of the nutrition society of australia thirteenth annual conference. P. 87. V. 13
- FL** Lushchekin, V. S. role of species specific acoustic signals in homing orientation of intact and anosmic kittens. *Zhurnal Vysshei Nervnoi Deyatel'Nosti Imeni I P Pavlova.* 31 (6). 1981 (Recd. 1982). 1171-1178.
- BioX** Luthman, J., Kindahl, H., and Jacobsson, S. O. 1989. the influence of flunixin on the response to salmonella typhimurium endotoxin in calves. *Acta Veterinaria Scandinavica* 30(3): 295-300.
- CP** Lutton, J. D., Abraham, N. G., Drummond, G. S., Levere, R. D., and Kappas, A. 1997. zinc porphyrins: potent inhibitors of hematopoiesis in animal and human bone marrow. *Proceedings of the National Academy of Sciences of the United States of*
- CP** Lutton, J. D., Wagner, F., Cook, P., Drummond, G., Levere, R. D., and Kappas, A. 1996. metalloporphyrin interactions with human cd34+ cells: toxicity of zinc porphyrins. *Experimental Hematology (Charlottesville)* 24(9): 1039.
- In Vit** Lyall, V., Majumdar, S., Prasad, R., Nath, R., and Mahmood, A. 1981. transport of zinc in rat intestine invitro during growth and development. *Indian Journal Of Biochemistry & Biophysics* 18(6): 430-433.
- Nut def** Lyman, S., Taylor, P., Lornitzo, F., Wier, A., Stone, D., Antholine, W. E., and Petering, D. H. activity of bleomycin in iron and copper-deficient cells. *Biochemical Pharmacology.* 38 (23). 1989. 4273-4282.
- Nut def** Lynch, S. M., Frei, B., Morrow, J. D., Roberts, L. J. 2nd, Xu, A., Jackson, T., Reyna, R., Klevay, L. M., Vita, J. A., and Keaney, J. F. Jr. 1997. vascular superoxide dismutase deficiency impairs endothelial vasodilator function through direct inactivation of nitric oxide and increased lipid peroxidation. *Arteriosclerosis, Thrombosis, and Vascular Biology* 17(11): 2975-81.
- CP** Lynch, S. M. and Klevay, L. M. 1994. contrasting effects of a dietary copper deficiency in male and female mice. *Proceedings Of The Society For Experimental Biology And Medicine.* 205(2): 190-196.
- Nut def** Lynch, S. M. and Strain, J. J. dietary saturated or polyunsaturated fat and copper deficiency in the rat. *Biol. Trace Elem. Res.* (1989) 22(2): 131-9.
- Org Met** Lynch, S. M. and Strain, J. J. increased hepatic lipid peroxidation with methionine toxicity in the rat. *Free Radical Res. Commun.* (1989) 5(4-5): 221-6.
- CP** Lynch Sean M(A), Morrow Jason D, Klevay Leslie M, and Frei Balz. 1996. increased plasma isoprostanes in rats fed a copper-deficient diet. *Circulation* 94(8 SUPPL.): I707.
- No Oral** Lyons, M. W. M. Insko and J. M. Martin. the effect of intraperitoneal injections of manganese, zinc, aluminum and iron salts on the occurrence of slipped tendons in chickens. *Poultry Science.* 17: 12-16.
- Nut def** Lytton, Fiona D. C. and Bunce, G. E. dietary zinc and parturition in the rat . i. uterine pressure cycles. *Biol. Trace Elem. Res.* (1986) 9(3): 151-63.

- Fate** LYUBCHANSKII, E. R., NIFATOV, A. P., OKOLELOVA, N. M., and SINYAKOV, E. G. the effect of sodium zinc and sodium calcium salts of diethylenetriaminepentaacetic-acid on behavior and biological action of plutonium-239 in rats. *MED RADIOL*; 30 (2). 1985. 35-39.
- FL** Ma XueYun and Sun CunXiao. 1997. effects of dietary zinc level on enzyme activity in serum of broilers. *Journal of Shandong Agricultural University* 28(1): 49-51.
- Abstract** Mabe I(A), Lima, F. R(A), Henriques, G. S., and Cozzolino, S. M. F. 1999. effects of dietary chelated and inorganic zinc and manganese on metallothionein accumulation in layers. *Poultry Science* 78(SUPPL. 1): 70.
- Diss** Mabrook, M. A. E. 1995. evaluation of three force molting procedures in laying hens. 186 P.
- Prim** Macapinlac, M. P., Barney, G. H., Pearson, W. N., and Darby, W. J. 1967. production of zinc deficiency in the squirrel monkey (*saimiri sciureus*). *Journal of Nutrition* 93(4): 499-510.
- Nut def** Macapinlac, M. P., Pearson, W. N., Barney, G. H., and Darby, W. J. 1968. protein and nucleic acid metabolism in the testes of zinc-deficient rats. *J. Nutr.* 95(4): 569-77 .
- Prim** Macapinlac, Manuel P., Barney, G. H., Pearson, William N., and Darby, William J. production of zinc deficiency in the squirrel monkey (*saimiri sciurea*). *J. Nutr.* (1967) 93(4): 499-510.
- Nut def** Macapinlac, Manuel P., Pearson, William N., and Darby, William J. some characteristics of zinc deficiency in the rat. *Zinc Metab.* [Pap. Symp.] (1966): 142-68
- Nut def** Macari, M., Zuim, S. M. F., and Lucas, M. A. D. D. the relationship among plasma minerals endocrine glands weights and viscera weights in undernourished runts and control pigs. *Ciencia e Cultura (Sao Paulo)*. 37 (2). 1985. 283-288.
- Nut** Macarulla, M. T., Marcos, R., Martinez, J. A., and Larralde, J. University of Navarra Spain Department of Physiology and Nutrition. 1990. body and tissue growth in mice fed on a zinc supplemented faba bean diet [vicia faba]. *FABIS Newsletter*. <Subtitle>Faba Bean Information Service. (No. 27) P. 26-29
- Nut** Macarulla, M. T., Marcos, R. B., Martinez, J. A., and Larralde, J. humoral and cellular mediated immune responses in legume fed mice after zinc supplementation. *Nutr. Res. (N. Y.)* (1992) 12(7): 905-14.
- Abstract** Macarulla, M. T., Martinez, J. A., and Larralde, J. 1989. influence of zinc on growth, muscle metabolism and nutritional-status of mice fed on a legume diet (vicia-faba). *Pflugers Archiv-European Journal of Physiology* 414: S13.
- FL** Macarulla, M. T., Martinez, J. A. Pais Vasco Univ. Vitoria Espana Facultad de Farmacia, Marcos, R., and Larralde, J. 1991. influence of faba bean (*vicia faba* l.) intake on the lymphoblastic proliferation and the complement system. <original> influencia de la ingestion de habas (*vicia faba* l.) sobre la proliferacion linfoblastica y el sistema del complemento. *Anales De Bromatologia*. V. 43(4) P. 383-393
- HHE** Macdonald, L. D., Gibson, R. S., and Miles, J. E. changes in hair zinc and copper concentrations of breast fed and bottle fed infants during the 1st 6 months. *Acta Paediatrica Scandinavica*. 71 (5). 1982. 785-790.
- No COC** Macdonald, R. L. and Kapur, J. 1999. acute cellular alterations in the hippocampus after status epilepticus. *Epilepsia* 40 Suppl 1: S9-20; discussion S21-2.

- In Vit** MacDonald, R. S., Wollard-Biddle, L. C., Browning, J. D., Thornton, W. H. Jr, and O'Dell, B. L. 1998. zinc deprivation of murine 3t3 cells by use of diethylenetrinitrilopentaacetate impairs dna synthesis upon stimulation with insulin-like growth factor-1 (igf-1). *Journal of Nutrition* 128(10): 1600-5.
- Unrel** MacGregor, J. T. 1990. dietary factors affecting spontaneous chromosomal damage in man. *Progress in Clinical and Biological Research* 347: 139-53.
- In Vit** Machaca, K. and Compton, M. M. 1992. characterization of apoptosis-like endonuclease activity in avian thymocytes. *Biology of the Cell* 76(1): 15-22.
- Nut def** Machen, M., Montgomery, T., Holland, R., Braselton, E., Dunstan, R., Brewer, G., and Yuzbasiyan-Gurkan, V. 1996. bovine hereditary zinc deficiency: lethal trait a 46. *Journal of Veterinary Diagnostic Investigation* 8(2): 219-227.
- Abstract** Machlin, L. J., Gabriel, E., and Macdonald, A. influence of zinc on per oxidative hemolysis and filtration rate of red blood cells from vitamin e deficient rats. *64TH ANNUAL MEETING OF THE FED. AM. SOC. EXP. BIOL., ANAHEIM, CALIF., USA, APR. 13-18, 1980. FED PROC.* 39 (3). 1980. Abstract 4105.
- Nut def** Machlin, Lawrence J. and Gabriel, Edda. interactions of vitamin e with vitamin c, vitamin b12, and zinc. *Ann. N. Y. Acad. Sci. (1980)* 355(Micronutr. Interact.: Vitam., Miner., Hazard. Elem.): 98-108.
- Mix** Machnik, G., Loew, O., Mueller, A., Gabler, U., and Schubert, H. 1992. the influence of zinc and colchicine on the thioacetamide-induced cirrhosis-like lesion in the rat. *Mol. Cell Biol. Liver Fibrogenesis Proc. Int. Falk Symp.* 521-3. Editor(s): Gressner, A. M.; Ramadori, G. Publisher: Kluwer, Dordrecht, Neth..
- Nut def** Mackay-Sim, A. and Dreosti, I. E. olfactory function in zinc-deficient adult mice. *Exp. Brain Res. (1989)* 76(1): 207-12.
- Nut def** Mackraj, I., Channa, M. L., Burger, F. J., Ubbink, J. B., and Smyth, P. zinc, copper and iron levels in tissues of the vitamin b6 deficient rat. *Int. J. Vitam. Nutr. Res. (1997)* 67(2): 102-105
- Mix** MacLachlan, G. K. and Johnston, W. S. 1982. copper poisoning in sheep from north ronaldsay maintained on a diet offerrestrial herbage. *Veterinary Record* 111(13): 299-301.
- Gene** MacLellan, W. R., Lee, T. C., Schwartz, R. J., and Schneider, M. D. 1994. transforming growth factor-beta response elements of the skeletal alpha-actin gene. combinatorial action of serum response factor, yy1, and the sv40 enhancer-binding protein, tef-1. *Journal of Biological Chemistry* 269(24): 16754-60.
- Nut def** MacMahon, R. A., Cussen, L. J., McDermott, F. T., and James, B. E. 1974. thymidine incorporation in eosophageal wounds of zinc-deficient rats. *Surgery, USA* 75(5): 660-663.
- Unrel** Maeda, H., Hashiguchi, I., Nakamuta, H., Toriya, Y., Wada, N., and Akamine, A. 1999. histological study of periapical tissue healing in the rat molar after retrofilling with various materials. *Journal of Endodontics* 25(1): 38-42.
- Nut** Maeda, Yoshiaki. effect of rat strain difference on iron, copper and zinc balance in the high phosphorus diet. *Kiyo - Seitoku Eiyo Tanki Daigaku (1997)* : 28, 8-13.
- No COC** Maenner, K. Freie Univ. Berlin Germany F. R. Inst. fuer Tierzucht und Tierernaehrung, Bronsch, K., and Wagner, W. 1987. the influence of zinc bacitracin on performance and energy

metabolism of laying hens. <original> einfluss von zinkbacitracin auf leistung und energietransfer bei legehennen. growth promoters in the animal production. possibilities and limits. <original> leistungsfoerderer in der tierproduktion. moeglichkeiten und grenzen. P. 597-608. No. 20

- In Vit** Maenz, D. D. and Classen, H. L. 1998. phytase activity in the small intestinal brush border membrane of the chicken. *Poultry Science*. 77(4): 557-563.
- IMM** Maes Michael(A), Vandoolaeghe Eric, Neels Hugo, Demedts Paul, Wauters Annick, Meltzer Herbert Y, Altamura Carlo, and Desnyder Roger. 1997. lower serum zinc in major depression is a sensitive marker of treatment resistance and of the immune/inflammatory response in that illness. *Biological Psychiatry* 42(5): 349-358.
- Nut def** Maesaka, Hideyuki. a histochemical study of the apud cells in oral region on experimentally induced zinc-deficient mice . with special reference to the taste buds and the mast cells. *Kanagawa Shigaku* (1988) 23(3): 337-50.
- FL** Maffeis, E., de Toledo, O. A., and Lia, R. C. 1974. [histologic study of the rat connective tissue response to acrylic resin reinforced zinc-oxide-eugenol cements]. <original> reacao do tecido conjuntivvo subcutaneo do rato ao implante de cimentos a base de oxide de zinco e eugenol reforcados com resina acrilica--estudo histologico. *Revista Da Faculdade De Farmacia e Odontologia De Araraquara* 8(2)
- Abstract** Magee, A. C. influence of dietary zinc on rats fed various protein levels and sources abstract growth hemo globin liver copper iron casein milk powder soy bean-d. *Federation Proceedings*. 28 (2). 1969 762
- CP** Magee, A. C. influence of zinc on calcium bioavailability. *Acs Symposium Series - American Chemical Society*. 1985. (275) p. 165-173.
- Nut def** Magee, A. C. and Grainger, F. P. zinc protein inter relationships in young rats. *Nutrition Reports International*. 20 (6). 1979 (Recd. 1980). 771-776.
- Abstract** Magee, A. C., Jones, B. P., Lin, F., Sinthsek, G., Frimpong, N. A., and Wu, S. effect of zinc on copper and bioavailability as influenced by dietary copper and fat source. *70TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 13-18, 1986. FED PROC.* 45 (4). 1986. 819.
- CP** Magee, A. C. and Kao, Y. S. 1987. effects of zinc and thiamin on growth and trace mineral status of young-rats. *Federation Proceedings* 46: 756.
- CP** Magee, A. C. and Lugeye, K. K. 1985. effect of zinc on growth and trace mineral status of rats fed low protein diets supplemented with amino-acids. *Federation Proceedings* 44: 543.
- Mix** Magee, Aden C. and Fu, Serena Chang. effects of calcium and phosphorus supplements on mineral balances of young zinc-fed rats. *Nutr. Rep. Int.* (1979) 19(3): 343-51 .
- Bio Acc** Magneson, G. R., Puvathingal, J. M., and Ray, W. J. Jr. 1987. the concentrations of free mg²⁺ and free zn²⁺ in equine blood plasma. *Journal of Biological Chemistry* 262(23): 11140-8.
- No Oral** Magnusson Jane E and Fleming Alison S(A). 1995. rat pups are reinforcing to the maternal rat: role of sensory cues. *Psychobiology* 23(1): 69-75.
- No COC** Magour, S. and Schramel, P. a possible relationship between functional tolerance to ethanol and the sub cellular distribution of zinc and copper in the brain. *Research Communications in Substances of Abuse*. 4 (1). 1983. 81-88.

- CP** Mahaffey, K. R. 1983. biotoxicity of lead: influence of various factors. *Federation Proceedings* 42(6): 1730-4.
- Unrel** MAHAFFEY, K. R. 1977. mineral concentrations in animal tissues certain aspects of federal drug administration regulatory role. *Journal of Animal Science* 44 (3): 509-515.
- Rev** Mahajan, S. K. 1989. zinc in kidney-disease. *Journal Of The American College Of Nutrition* 8(4): 296-304.
- Alt** Mahajan, S. K., Bowersox, E. M., Rye, D. L., Abuhamdan, D. K., Prasad, A. S., Mcdonald, F. D., and Biersack, K. L. 1989. factors underlying abnormal zinc-metabolism in uremia. *Kidney International* 1989, V36, S27, Ps269-S273
- No Dose** Mahan, D. C. and Newton, E. A. 1995. effect of initial breeding weight on macro- and micromineralcomposition over a three-parity period using a high-producing sowgenotype. *Journal of Animal Science* 73(1): 151-156.
- Unrel** Maher, W. P., Johnson, R. L., Hess, J., and Steiman, H. R. 1992. biocompatibility of retrograde filling materials in the ferret canine. amalgam and irm. *Oral Surgery, Oral Medicine, and Oral Pathology* 73(6): 738-45.
- Nut def** Mahin, L., Chadli, M., and Marzou, A. 1984. osteodystrophy in growing lambs fed a diet rich in wheat bran. *Veterinary Record* 115(14): 355-357.
- Nut def** Mahin, L. and Lamand, M. 1982. similarities of some clinical aspects of protein and energy malnutrition to copper, zinc and cobalt deficiencies in ruminants. *Annales De Recherches Veterinaires* 13(2): 171-175 .
- Nut def** Mahmoud, O. M., Samani, F. el, Bakheit, A. O., and Hassan, M. A. 1983. zinc deficiency in sudanese desert sheep. *Journal of Comparative Pathology* 93(4): 591-595.
- Phys** Mahoney, M. G., Tang, W., Xiang, M. M., Moss, S. B., Gerton, G. L., Stanley, J. R., and Tseng, H. 1998. translocation of the zinc finger protein basonuclin from the mouse germ cell nucleus to the midpiece of the spermatozoon during spermiogenesis. *Biology of Reproduction* 59(2): 388-94.
- IMM** Maidment, Clem A and Thomas, Julie. 1995. using bovine colostrum for immunological studies. *Journal of Biological Education* 29(2): 92-94.
- No Oral** Main, J. H., Mock, D., Beagrie, G. S., and Smith, D. C. 1975. investigation of possible oncogenic action of zinc polycarboxylate cement by implantation in mice and hamsters. *Journal of Biomedical Materials Research* 9(1): 69-78.
- In Vit** Maines, M. D. and Veltman, J. C. 1984. phenylhydrazine-mediated induction of heme oxygenase activity in rat-liver and kidney and development of hyperbilirubinemia - inhibition by zinc-protoporphyrin. *Biochemical Journal* 217(2): 409-417.
- Unrel** Maines Mahin D, Mark Jennifer A, and Ewing James F. 1993. heme oxygenase, a likely regulator of cgmp production in the brain: induction in vivo of ho-1 compensates for depression in nitric oxide synthase activity. *Molecular and Cellular Neuroscience* 4(5): 398-405.
- Mineral** Mainka, S. A., Li, Mao, and Zhao, Guanlu. dietary vitamin and mineral concentrations of two juvenile female giant pandas (*ailuropoda melanoleuca*). *J. Wildl. Dis.* (1991) 27(3): 509-12
- Unrel** Mair, R. G., Gesteland, R. C., and Blank, D. L. 1982. changes in morphology and physiology of

olfactory receptor cilia during development. *Neuroscience* 7(12): 3091-103.

- No Oral** Maitani, Tamio and Suzuki, Kazuo T. age- and sex-dependent variations of essential metal levels in tissues and responses to dextran sulfate treatment which induces zinc-thionein. *Chem. Pharm. Bull.* (1983) 31(12): 4456-63.
- No Oral** Maitani, Tamio and Suzuki, Kazuo T. extents of hepatic zinc-thionein induction in mice given an equimolar dose of various heavy metals. *Chem. Pharm. Bull.* (1982) 30(11): 4164-9.
- No COC** Majdak, I., Zabkar, J., Kralj, M., Kos, K., Kosmerl, S., Brenner, I., Hocurscak, S., and Bombek, Z. 1977. nutritive effect of 10% zinc bacitracin in fattening chickens. *Veterinarski Arhiv* 47(4): 199-206.
- Nut def** Majumder, M. S. I. and Ali, Akbar. effect of zinc deficiency on peyer's patches of rabbits. *Nutr. Res. (N. Y.)* (1987) 7(10): 1103-8.
- Unrel** Mak, K. M. and Jersild, R. A. an electron microscopic study of zinc iodide osmium staining of the golgi apparatus of rat intestinal epithelial cells. *Proceedings of the Indiana Academy Science*. 78. 1968 162
- FL** Makarchuk, N. E. and Rytikova, L. S. 1996. [the behavioral reactions of anosmic rats to new complex stimuli]. <original> povedencheskie reaktsii anosmirovannykh krysov na novye kompleksnye razdrazhiteli. *Zhurnal Vysshei Nervnoi Deiatelnosti Imeni I P Pavlova* 46(1): 176-8.
- FL** Makarova, L. A. and Chekalova, T. M. 1979. zinc content of the blood serum of hens at different stages of ovarianfunction. *Sbornik Nauchnykh Trudov Moskovskaya Veterinarnaya Akademiya* 106: 28-30.
- Nut** Makartsev, N. G. and Khadanovich, I. V. 1983. premixes in the diets for young pigs fattened intensively. *Doklady VASKhNIL* (4): 31-34.
- FL** Makartsev, N. G., Khadanovich, I. V., Vtorykh, E. A., Kravaine, R. S., and Klabukova, L. N. 1982. effect of premixes with various levels of iron and zinc on retention of nitrogen and minerals and bodyweight gain by young pigs. <document title>biokhimiya pitaniya i kormlenie molodnyakasel'skokhozyaistvennykh zhivotnykh pri rannem ot"eme. 70-79.
- CP** Makdani, D., Mickelsen, O., Ullrey, D., and Ku, P. K. 1975. effect of phytic acid on rat growth and availability of zinc, copper, iron and calcium. *Federation Proceedings* 34: 926.
- FL** Makishima, T. 1988. [development of zinc oxide eugenol sealer with antimicrobial agent]. *Gifu Shika Gakkai Zasshi* 15(1): 48-68.
- Not Avail** Makled, M. N., El-Hammady, H. Y. Assiut Univ. Egypt Faculty of Agriculture, and Osman, A. M. Assiut Univ. Egypt Faculty of Veterinary Medicine. 1974. growth and mineral content of certain organs [liver, heart, spleen, proventriculus] of chicks [local dokki 4 breed] as influenced by supplemental mn, zn and cu [manganese, zinc, copper]. *Assiut Journal of Agricultural Science*. V. 5(1) P. 99-107
- Nut** Makled, M. N., Khattab, M. S., and El-Hammady, H. Y. effect of feeding zinc additives on chickens blood components of immunological properties. *Egypt. J. Anim. Prod.* (1973) 13(1): 49-58 .
- FL** Maklid, N I. influence of additional nutrition with zinc sulphate on growth and development of ducklings. *Visnyk Sil's'Kohospodar Nauk* 1969 7: 97-100.

- FL** Maklid, N. I. influence of supplementary feeding with zinc sulfate on growth and development of ducklings. *Visnyk Silskohospodarskod Nauky* (1969) 12(7): 97-100 .
- FL** Maklid, N. I. level of some macro- and trace elements in ducks fed zinc sulfate. *Dokl. Vses. Akad. Sel'Skokhoz. Nauk* (1970) (9): 38-9.
- FL** Mal'ko, V. A., Gulii, M. F., Chizhskaya, G. Ya., and Mel'nichuk, D. A. activation of carboxylation and level of the biosynthesis processes in chicks. *Ukr. Biokhim. Zh.* (1970) 42(5): 649-53.
- FL** Mal'tsev, K. V., Ul'iashin, V. V., Karelin, A. A., Tsetlin, V. I., Beliaev, S. V., Ivanov, V. T., Rylov, A. L., Dolgov, O. N., and Sherstnev, V. V. 1993. [neuroactive complexed zinc compounds from bovine brain]. <original> neuroaktivnye kompleksnye soedineniia tsinka iz mozga krupnogo rogatogo skota. *Bioorganicheskaiia Khimiia* 19(9): 862-70.
- No Oral** Mal'tsev, K. V., Ul'yashin, V. V., Karelin, A. A., Tsetlin, V. I., Belyaev, S. V., Ivanov, V. T., Rylov, A. L., Dolgov, O. N., and Sherstnev, V. V. neuroactive zinc complexes from bovine brain. *Bioorg. Khim.* (1993) 19(9): 862-70.
- No COC** Malhi, C. S. Chopra G. and Parshad V. R. 1986. poison baiting of rodents in wheat triticum aestivum. *Indian J.Agric.Sci.* 56(8): 609-611.
- Mix** Maljkovic, T., Blanusa, M., and Kostial, K. health effect of ash from coal gasification and interaction with cadmium in rats. *Stud. Environ. Sci.* (1988) 34(Chem. Prot. Environ. 1987): 51-5 .
- Abstract** Malkinson, A. M. developmental changes in protein phosphorylation in mice. *FED PROC. Federation Proceedings.* 35 (7). 1976 1796
- Nut def** Maltin, C. A., Duncan, L., Wilson, A. B., and Hesketh, J. E. effect of zinc deficiency on muscle fiber type frequencies in the post-weanling rat . *Br. J. Nutr.* (1983) 50(3): 597-604, 3 plates.
- Nut def** Maltin, C. A., Duncan, L., Wilson, A. B., and Hesketh, J. E. effect of zinc deficiency on muscle fibre type frequencies in the post-weanling rat. *The British Journal Of Nutrition.* Nov 1983. v. 50 (3) p. 597-604. plates.
- Sludge** Maly, Mark S. Miami Univ OH. survivorship of meadow voles, microtus pennsylvanicus, from sewage. *Bull Environ Contam Toxicol.* V32, N6, P724(8)
- FL** Mamani, N. J. P. 1996. effects of high dietary levels of copper and zinc on performance of weanling pigs. <original> efeitos da suplementacao de altos niveis dieteticos de cobre e zinco no desempenho de leitoes. 62 P.
- Nut def** Mamba, K. Yamaguchi Univ. Japan Faculty of Agriculture, Taniguchi, K., Kagabu, S., and Makita, T. 1989. quantitative and morphological studies on the influence of zinc deficiency on the liver of pregnant rats. *Japanese Journal of Veterinary Science.* V. 51(3) P. 566-573
- Nut def** Mameesh, M. S., Keen, C. L., and Hurley, L. S. 1989. effect of zinc or copper deficiency on erythrocyte purine nucleoside phosphorylase and pyruvate kinase activity in the rat. *International Journal for Vitamin and Nutrition Research* 59(4): 390-5.
- FL** Man, L. Kh. and Molchanov, I. A. 1980. effect of dietary protein quality and quantity on mineral metabolism in hens. *Sbornik Nauchnykh Trudov Moskovskoi Veterinarnoi Akademii* 110: 75-80.

- In Vit** Manabe, N., Ishibashi, T., and Fujimura, H. 1982. morphology and distribution of langerhans cells in the epidermis of the goat. *Japanese Journal of Zootechnical Science*. 53(12): 781-785.
- FL** Manabe Noboru, Furuya Yoshihiro, Azuma Yasuyoshi, and Miyamoto Hajime. 1993. histological and morphometrical properties of cattle epidermal langerhans cells. *Animal Science and Technology* 64(1): 1-7.
- No COC** Mancuso, C., Kostoglou Athanassiou, I. , Forsling, M. L., Grossman, A. B., Preziosi, P., Navarra, P., and Minotti, G. 1997. activation of heme oxygenase and consequent carbon monoxide formation inhibits the release of arginine vasopressin from rat hypothalamic explants. molecular linkage between heme catabolism and neuroendocrine function. *Vol. 50, No. 1-2, Pp. 267-276* Mol. Brain Res.
- Prim** Mandell, Carol P. and George, Jeanne W. effect of repeated phlebotomy on iron status of rhesus monkeys (macaca mulatta). *Am. J. Vet. Res.* (1991) 52(5): 728-33
- Drug** Mandenoff, A., Fumeron, F., Apfelbaum, M., and Margules, D. L. endogenous opiates and energy balance. *SCIENCE (WASH D C)*. 215 (4539). 1982. 1536-1538.
- Not Avail** Mandour, A., Taha, N., and Korshom, M. Alexandria Univ. Egypt Faculty of Veterinary Medicine. 1992. some biochemical studies on broiler chickens supplemented with different dietary zinc levels. *Benha Veterinary Medical Journal*. V.3(1) P. 44-50
- Bio Acc** Mangal, P. C. and Gulati, N. 1981. trace elements in animal feed and animal tissues: a correlation study by neutron activation method. *Indian Journal of Experimental Biology* 19(5): 441-444.
- Nut def** Mangian, H. F., Li, G., Paul, G. L., and Shay, N. F. 1997. blood leptin levels are reduced during zinc deficiency-induced anorexia. *FASEB Journal* 11(3): A194.
- Nut def** Mangian, H. F., Williamson, S., and Shay, N. F. 1999. hypothalamic neuropeptide-expressing during the intitiation of zinc deficiency. *FASEB Journal* 13(4 PART 1): A570.
- Nut def** Mangian, Heather F., Lee, Rita G., Paul, Gregory L., Emmert, Jason L., and Shay, Neil F. zinc deficiency suppresses plasma leptin concentrations in rats. *J. Nutr. Biochem.* (1998) 9(1): 47-51.
- FL** Mangler, B. 1985. *Kinetics of Cumulation and Histopathological Changes in the Renal Tissue of Rats After Chronic Exposure to Cd in Drinking Water; Investigation of the Decay Curve and Reversibility of Induced Lesions*. <NOTE> Diss. (Dr.Rer.Nat. NP-8770343
- Nut def** Mann, S. O., Fell, B. F., and Dalgarno, A. C. 1974. observations on the bacterial flora and pathology of the tongue of sheep deficient in zinc. *Research in Veterinary Science* 17(No.1): 91-101.
- HHE** Mann, T. and Lutwak-Mann, C. 1982. passage of chemicals into human and animal semen: mechanisms and significance. *Critical Reviews in Toxicology* 11(1): 1-14.
- Drug** Manner, K. and Wang, K. 1991. effectiveness of zinc bacitracin on production traits and energy metabolism of heat-stressed hens compared with hens kept under moderate temperature. *Poultry Science*. 70(10): 2139-2147.
- No Oral** Mano, M., Kimoto, I., Hattori, T., Okumura, Y., Takeuchi, S., Nakajima, Y., Kashima, Y., Ishikawa, H., and Arakawa, Y. metal metabolism in diabetes mellitus in osteogenic disorder shionogi (ods) rat. *Biomed. Res. Trace Elem.* (1993) 4(2): 137-8.

- Drug** Mansour, M. A., el-Ridi, A. M., Soubhi, M. M., el-Gamal, R. L., and Mahfouz, S. 1986. effect of dietary zinc supplementation on the pathogenesis of hepatosplenomegaly in experimental schistosomiasis. *Journal of the Egyptian Society of Parasitology* 16(2): 645-51.
- Nut def** Mansour, M. M., El-Malkh, N. M., and El-Zayat, E. M. 143. effect of dietary zinc deficiency on serum and testicular total protein contents in male albino rats. *J. Drug Res.* 18 ISS 1-2 1989
- Nut def** Mansour, M. M., Hafiez, A. A., el-Kirdassy, Z. H., el-Malkh, M. N., Halawa, F. A., and el-Zayat, E. M. 1989. role of zinc in regulating the testicular function. part 2. effect of dietary zinc deficiency on gonadotropins, prolactin and testosterone levels as well as 3 beta-hydroxysteroid dehydrogenase activity in testes of male albino rats. *Die Nahrung* 33(10): 941-7.
- Drug** Mansour, M. M., Mikhail, M. M., and Guirgis, N. I. effect of zinc supplementation on s. mansoni-infected hamsters. *Ann. Trop. Med. Parasitol.* (1983) 77(5): 517-21 .
- Nut def** Mansour, M. M. S., Hafiez, A. A., El-Kirdassy, Z. H. M., El-Malkh, M. N., Halawa, F. A., and El-Zayat, E. M. I. role of zinc in regulating the testicular function. part 2. effect of dietary zinc deficiency on gonadotropins, prolactin and testosterone levels as well as 3.beta.-hydroxysteroid dehydrogenase activity in testes of male albino rats. *Nahrung* (1989) 33(10): 941-7.
- Drug** March, B. E., Akinwande, A., and Soong, R. 1972. the effect of feeding antibiotics for different periods on growth rate, feed conversion and metabolizability of dietary energy in growing chickens. *Poultry Science* 51(4): 1409-1414.
- Bact** Marco, E. 1995. sudden deaths in sows. *Pig Journal* 35: 157-163.
- Herp** Marechal, V., Elenbaas, B., Taneyhill, L., Piette, J., Mechali, M., Nicolas, J. C., Levine, A. J., and Moreau, J. 1997. conservation of structural domains and biochemical activities of the mdm2 protein from xenopus laevis. *Vol. 14, No. 12, Pp. 1427-1433 Oncogene*
- Nut** Mares-Perlman, J. A., Klein, B. E., Klein, R., Ritter, L. L., Freudenheim, J. L., and Luby, M. H. 1993. nutrient supplements contribute to the dietary intake of middle- and older-aged adult residents of beaver dam, wisconsin. *Journal of Nutrition* 123(2): 176-88.
- Abstract** Margolis, J. W., Koepp, S. J., and Gona, O. behavioral and ultrastructural studies of the effects of zinc sulfate caused anosmia in male mice. *BULL N J ACAD SCI.* 22 (2). 1977 43
- Surv** Margolles, E., Colome, H., Labrada, I., and Mayari, R. some results of the metabolic profile test in dairy cattle in cuba. *Revista De Salud Animal.* 10 (3). 1988. 228-235.
- CP** Marine, J. and Winoto, A. 1991. the human enhancer-binding protein gata3 binds to several t-cell receptor regulatory elements. *Proceedings of the National Academy of Sciences of the United States of*
- Phys** Marine, J. C., Gilbert, D. J., Bellefroid, E. J., Martial, J. A., Ihle, J. N., Copeland, N. G., and Jenkins, N. A. 1996. chromosomal location of fifteen unique mouse krab-containing zinc finger loci. *Mammalian Genome* 7(6): 413-6.
- In Vit** Markant, A. and Pallauf, J. 1996. metallothionein and zinc as potential antioxidants in radical-induced lipid peroxidation in cultured hepatocytes. *Journal of Trace Elements in Medicine and Biology* 10(2): 88-95.
- Unrel** Markiewicz, Jan and Harpula, Zbigniew. experimental studies on the effect of some trace elements on oxidation of alcohol in perfused rat liver. *Blutalkohol* (1983) 20(5): 427-33.

- FL** Markiewicz, K., Bronicki, M., Luczak, Z., and Kowalczyk, R. Akademia Rolniczo-Techniczna Olsztyn Poland Katedra Chorob Wewnetrznych. 1988. effect of dietary zinc and sulphur on health status and productivity of sheep. <original> wpływ podawania cynku i siarki na stan zdrowia i produktywnosc owiec. *Medycyna Weterynaryjna*. V. 44(2) P. 95-97
- Unrel** Markkola, A. and Anttila, M. 1999. lethal acrodermatitis in a non-white bull terrier. *Suomen Elainlaakarilehti* 105(11): 589-592.
- Phys** Markov Yu G. interrelations between zinc-positive cells and prostaglandins in various organs. *LATV ZINAT AKAD VESTIS*. 0 (9). 1991. 83-89.
- In Vit** Markov, Yu. G. 1986. regulation of zinc metabolism in the duodenal epithelium by prostaglandins. 92-93.
- Fate** Markov Yu G(A), Berzin', N. I., and Val'dman, A. R. 1992. morphological analysis of zinc-accumulation capacity in organs of the digestive system. *Byulleten' Eksperimental'noi Biologii i Meditsiny* 113(3): 324-327.
- No Dose** Markova, O. O., Misula, I. R., Bodnar, Ya. Ya., Kvik, I. I., and Boris, A. P. the level of macro- and microelements in the cardiac muscle of adult and old rats after the stress influence. *Fiziol. Zh. (Kiev)* (1995) 41(1-2): 100-104.
- Biom** Marks Gerald S. 1994. heme oxygenase: the physiological role of one of its metabolites, carbon monoxide and interactions with zinc protoporphyrin, cobalt protoporphyrin and other metalloporphyrins. *Cellular and Molecular Biology (Noisy-Le-Grand)* 40(7): 863-870.
- In Vit** Marlow, R. and Freeman, S. J. 1989. failure of zinc to prevent dysmorphogenesis of cultured rat conceptuses by anti-yolk sac antiserum. *Life Sciences* 44(13): 837-46.
- In Vit** Marlow, Roberta and Freeman, Stuart J. failure of zinc to prevent dysmorphogenesis of cultured rat conceptuses by anti-yolk sac antiserum. *Life Sci.* (1989) 44(13): 837-46.
- FL** Marois, M., Rateau, J. C., and Elie, C. 1982. [histologic study of stimulation of preputial glands in the mouse by androgens and inhibition by a detergent or zinc salts]. <original> etude histologique de la stimulation des glandes preputiales de souris par des androgenes et de l'inhibition par un detergent ou des sels de zinc. *Bulletin De L'Association Des Anatomistes* 66(195): 491-506.
- FL** Marois, M., Rateau, J. G., Marois, G., and Elie, C. 1982. study of the development of preputial glands and of seminal-vesicles in the prepubescent mouse in the function of age and weight of the animals and in the function of the weight of the testicles - comparative-study of the stimulation of preputial glands and of seminal-vesicles of the mouse under the action of diverse androgenous steroids - study of the antagonistic action exerted by a detergent, a superinone and by zinc salts on the stimulation of the preputial glands of the mouse provoked by diverse androgenous steroids. *Semaine Des Hopitaux* 58: 1398.
- Gene** Maroney, A. C., Qureshi, S. A., Foster, D. A., and Brugge, J. S. 1992. cloning and characterization of a thermolabile v-src gene for use in reversible transformation of mammalian cells. *Oncogene* 7(6): 1207-14.
- FL** Marquering, B. and Wiemann, H. effects of different dietary calcium levels on zinc-65 metabolism in quails (*coturnix c. japonica*). *Arch. Gefluegelk.* (1970) 34(2): 62-5.
- Unrel** Marques, D. M. 1979. roles of the main olfactory and vomero nasal systems in the response of the female hamster *mesocricetus-auratus* to young. *Behavioral and Neural Biology*. 26(3):

- Chem Meth** Marrella, Mauro and Milanino, Roberto. simple and reproducible method for acid extraction of copper and zinc from rat tissue for determination by flame atomic absorption spectroscopy. *At. Spectrosc.* (1986) 7(1): 40-2 .
- Phys** Marret, S., Bonnier, C., Raymackers, J. M., Delpech, A., Evrard, P., and Gressens, P. 1999. glycine antagonist and no synthase inhibitor protect the developing mouse brain against neonatal excitotoxic lesions. *Pediatric Research* 45(3): 337-42.
- Acu** Marrs, T. C., Clifford, W. E., and Colgrave, H. F. 1983. pathological changes produced by exposure of rabbits and rats to smokes from mixtures of hexachloroethane and zinc oxide. *Toxicology Letters* 19(3): 247-52.
- Carcin** Marrs, T. C., Colgrave, H. F., Edgington, J. A., Brown, R. F., and Cross, N. L. 1988. the repeated dose toxicity of a zinc oxide/hexachloroethane smoke. *Archives of Toxicology* 62(2-3): 123-32.
- HHE** Marsal, K. and Furgyik, S. 1987. zinc concentrations in maternal blood during pregnancy and post partum, in cord blood and amniotic-fluid. *Acta Obstetricia Et Gynecologica Scandinavica* 66(7): 653-656.
- Nut def** Marschner, H. and Cakmak, I. 1986. mechanism of phosphorus-induced zinc-deficiency in cotton .2. evidence for impaired shoot control of phosphorus uptake and translocation under zinc-deficiency . *Physiologia Plantarum* 68(3): 491-496.
- Plant** Marsh, Dyremple B., Waters, Luther Jr., and Ascher, Peter D. 1985. the use of a split-root technique to study zinc movement and activity in a nodulating cowpea root system. *HortScience* 20(3): 425-7 .
- Org Met** MARSHALL, E. why you should use tracking powders. *PEST CONTROL*; 57 (9). 1989. 34-35.
- Alt** Marshall, J. F. further analysis of the resistance of the diabetic rat to dextro amphetamine. *Pharmacology Biochemistry and Behavior.* 8 (3). 1978 281-286.
- Rev** Martelli, P. 1996. control of enteritis. *Rivista Di Suinicoltura* 37(5): 45-47.
- OAC** Martin, C., Fessi, H., Lambert, F., Fontanille, P., Martin, S., and Fatome, M. 1997. effects of treatment with liposomal superoxide dismutase on the lethality of irradiated mice. *Travaux Scientifiques Des Chercheurs Du Service De Sante Des Armees* 0(18): 33-34.
- Nut def** Martin, G. B., White, C. L., Markey, C. M., and Blackberry, M. A. 1994. effects of dietary zinc deficiency on the reproductive system of youngmale sheep: testicular growth and the secretion of inhibin and testosterone. *Journal of Reproduction and Fertility* 101(1): 87-96.
- Nut def** Martin, G. B(A) and White, C. L. 1992. effects of dietary zinc deficiency on gonadotrophin secretion and testicular growth in young male sheep. *Journal of Reproduction and Fertility* 96(2): 497-507.
- No Oral** Martin, L. R., Tidwell, E., Tenca, J. I., Pelleu, G. B., and Longton, R. W. 1975. *Histologic Response of Rat Connective Tissue to Zinc-Containing Amalgam.* <NOTE> *Medical Research Progress Rept J. Endodontics.* 2(1): 25-27.
- Drug** Martin, L. R., Tidwell, E., Tenca, J. I., Pelleu, G. B. Jr, and Longton, R. W. 1976. histologic response of rat connective tissue to zinc-containing amalgam. *Journal of Endodontics* 2(1): 25-7.

- HHE** Martin, M. T., Jacobs, F. A., and Brushmiller, J. G. 1984. identification of copper-binding and zinc-binding ligands in human and bovine-milk. *Journal Of Nutrition* 114(5): 869-879.
- CP** Martin William(A). 1999. oxidative stress and abnormal neurotransmission in genital smooth muscle. *British Journal of Pharmacology* 126(PROC. SUPPL.): 321P.
- In Vit** Martina Marco, Mozrzymas Jerzy W, Strata Fabrizio, and Cherubini Enrico(A). 1996. zinc modulation of bicuculline-sensitive and -insensitive gaba receptors in the developing rat hippocampus. *European Journal of Neuroscience* 8(10): 2168-2176.
- Gene** Martinerie, C., Chevalier, G., Rauscher, F. J. 3rd, and Perbal, B. 1996. regulation of nov by wt1: a potential role for nov in nephrogenesis. *Oncogene* 12(7): 1479-92.
- No Dose** Martinez, J. A., Barcina, Y., and Larralde, J. induced biochemical and physiological changes in young and adult growing rats fed on a vegetable or animal protein diet. *Growth (1986)* 50(2): 178-84 .
- Nut def** Martinez, J. A., Barcina, Y., and Larralde, J. 1985. interrelationships between zinc supply and protein source in young and adult rats. *Nutrition Reports International* 32(5): 1037-1046.
- FL** Martinez, J. A., Barcina, Y., and Larralde, J. zinc bioavailability from a faba bean diet to rats. *Rev. Esp. Fisiol. (1986)* 42(1): 123-4.
- Nut** Martinez, J. Alfredo, Macarulla, M. Teresa , Marcos, Rafael, and Larralde, Jesus. nutritional outcome and immunocompetence in mice fed on a diet containing raw field beans (vicia faba, var. minor) as the source of protein. *Br. J. Nutr. (1992)* 68(2): 493-503 .
- No Tox** Martinez, Lista E., Sole, J., Arola, L., and Mas, A. changes in plasma copper and zinc during rat development. *Biol. Neonate (1993)* 64(1): 47-52.
- Nut def** Martinez, M. G., Lopez, H., and Navia, J. M. 1976. histopathologic changes in zinc-deficient guinea-pigs fed a purified diet. *Journal Of Dental Research* 55: B66.
- In Vit** Martinez-Martinez, A., Flores-Flores, C., Campoy, F. J., Munoz-Delgado, E., Fini, C., and Vidal, C. J. 1998. biochemical properties of 5'-nucleotidase from mouse skeletal muscle. *Biochimica Et Biophysica Acta* 1386(1): 16-28.
- No COC** Martinez-Noel, G., Niedenthal, R., Tamura, T., and Harbers, K. 1999. a family of structurally related ring finger proteins interacts specifically with the ubiquitin-conjugating enzyme ubcm4. *FEBS Letters* 454(3): 257-61.
- Mix** Martinova, Y., Petkova, S., and Topashka-Ancheva, M. 1998. in vivo effect of polymetallic industrial dust on mice spermatogenic cells and chromosome reactivity. *Warsaw '98 Int. Symp. Exhib. Environ. Contam. Cent. East. Eur., Symp. Proc., 4th* : 1187-1191 Publisher: Institute for International Cooperative Environmental Research, Florida State University, Tallahassee, Fla..
- No COC** Martinovich, P. and Margolin, S. 1975. enzyme and hormone preparations in feeds for young fattening cattle. *Molochnoe i Myasnoe Skotovodstvo* (1): 43-44.
- Unrel** Martins, C. E., Coser, A. C., Oliveira, F. T. T. D., and Saraiva, O. F. evaluation of limiting nutrients on alfalfa growth in alluvial soil. *Revista Da Sociedade Brasileira De Zootecnia.* 19 (4). 1990. 333-339.
- Unrel** Martins, J. 1968. [behavior of the alveolar tissues of the rat in the presence of various root canal

obturation materials. morphologic study]. <original> comportamento dos tecidos do alveolo dental do rato em presenca de algumas pastas obturadoras de canal radicular. *Revista Brasileira De Odontologia* 25(152): 215-26.

- FL** Martins, M. F., Ferreira Neto, J. M., and Silva, R. M. 1981. phosphorus, calcium, magnesium, iron, zinc and copper in the bloodserum of pigs given different diets with detoxified castor meal. *Arquivos Da Escola De Veterinaria Da Universidade Federal De Minas Gerais* 33(1): 5-18.
- FL** Martinsson, K. and Ekman, L. 1974. (treatment trial of zinc in piglets with the wasting syndrome followingweaning). *Svensk Veterinartidning* 26(No.24): 824-828.
- FL** Martinsson, K., Ekman, L., Lofstedt, M., Figueiras, H., and Jonsson, L. 1978. organ weights and concentration of zinc in different tissues of pigs and pigs with regional ileitis. *Zentralblatt Fur Veterinarmedizin, A* 25(7): 570-578.
- Nut def** Marusic, Ana, Kos, Ksenija, Stavljenic, Ana, and Vukicevic, Slobodan. acute zinc deficiency and trabecular bone loss in rats with talc granulomatosis. *Biol. Trace Elem. Res.* (1991) 29(2): 165-73.
- Drug** Marusich, W. L., Ogrinz, E. F., Brown, P. R., and Mitrovic, M. 1973. comparative efficacy of intermittent and continuous feeding of four antibiotics at low levels in broilers. *Poultry Science* 52(5): 1774-1779.
- Drug** Marusich, W. L., Ogrinz, E. F., Camerlengo, N., and Mitrovic, M. 1977. effect of diet on the performance of broiler chickens fed lasalocid in combination with growth promotants. *Poultry Science* 56(4): 1297-1304.
- Drug** Marusich, W. L., Ogrinz, E. F., Camerlengo, N., and Mitrovic, M. 1976. lasalocid compatibility studies with broiler growth promotants utilizing 2 rations. *Poultry Science*. 55 (5): 2061-2062
- Drug** Marusich, W. L., Ogrinz, E. F., Camerlengo, N., and Mitrovic, M. 1978. use of a rye soybean ration to evaluate growth promotants in chickens. *Poultry Science*. 57 (5) 1297-1304.
- No COC** Marusich, W. L., Ogrinz, E. F., and Mitrovic, M. 1974. laboratory model for the detection of poultry growth promotants. *British Poultry Science* 15(6): 525-533.
- Drug** Marusich, W. L., Ogrinz, E. F., and Mitrovic, M. 1974. a new antibiotic, x-5108, for improved growth and feed conversion in poultry. *Poultry Science* 53(3): 936-945.
- Abstract** Maruyama, K. and Sunde, M. L. 1977. comparative lysine requirement of anconas at various dietary levels of arginine selected for needing high dietary zinc. *Poultry Science*. 56 (5) 1734
- In Vit** Marzabadi, Massoud R. and Jones, Charles B. heavy metals and lipofuscinogenesis. a study on myocardial cells cultured under varying oxidative stress. *Mech. Ageing Dev.* (1992) 66(2): 159-71.
- No Oral** Mas, A. and Arola, L. 1985. cadmium and lead toxicity effects on zinc copper nickel and iron distribution in the developing chick embryo. *Comp. Biochem. Physiol. C, Pharmacol. Toxicol.* 80(1): 185-188.
- Bio Acc** Mas, A., Romeu, A., Alemany, M., and Arola, L. 1985. iron, zinc, and copper content in the tissues of the rat during pregnancy. *Biological Trace Element Research*. 8(2): 105-111.
- No Dose** Mas, A., Romeu, A., Alemany, M., and Arola, Ll. iron, zinc, and copper content in the tissues of the rat during pregnancy. *Biol. Trace Elem. Res.* (1985) 8(2): 105-11 .

- No Oral** Mas, A. and Arola L. 1985. cadmium and lead toxicity effects on zinc, copper, nickel and iron distribution in the developing chick embryo. *Comp.Biochem.Physiol.C.* 80(1): 185-188.
- Nut def** Masaoka, T., Shirai, M., Tuboi, T., and Akahori, F. effect of cadmium and zinc on serum or lung angiotensin i converting enzyme activity in rats . *Biomed. Res. Trace Elem.* (1993) 4(2): 99-100.
- Prim** Masaoka, Toshio, Akahori, Fumiaki, Arai, Shigeyuki, Nomiyama, Kazuo, Nomiyama, Hiroko, Kobayashi, Kosaku, Nomura, Yasuo, and Suzuki, Tatsuo. nine-year chronic toxicity study of cadmium ingestion in monkeys . i. effects of dietary cadmium on the general health of monkeys. *Vet. Hum. Toxicol.* (1994) 36(3): 189-94.
- Org Met** Masincupp, F. B. 1974. the effect of zinc-protein added to swine finishing rations. *Tennessee Farm and Home Science* (89): 30-31.
- No Oral** Maskar, U. 1972. [heterotopical tissue growth with malignant degeneration in testicles of chickens following injection of zinc chlorate solution]. <original> heterotopische gewebsbildungen mit maligner entartung im hoden von hahnen nach injektion von zinkchloratlosung. *Acta Anatomica* 81(1): 68-73.
- Plant** Maskina, M. S. and Randhawa, N. S. effect of organic manures and zinc levels on the availability of zinc iron manganese and copper to wetland rice oryza-sativa. *Indian Journal of Agricultural Sciences.* 53 (1). 1983. 48-52.
- Nut def** Mason, K. E., Burns, W. A., and Smith, J. C. Jr. testicular damage associated with zinc deficiency in pre pubertal and post pubertal rats response to zinc repletion. *Journal of Nutrition.* 112 (5). 1982. 1019-1028.
- Nut def** Mason, Karl E., Burns, Willard A., and Smith, J. Cecil Jr. 1982. testicular damage associated with zinc deficiency in pre- and postpubertal rats : response to zinc repletion. *J. Nutr.* 112(5): 1019-28 .
- Gene** Mason, M. M., Grasso, J. A., Gavrilova, O., and Reitman, M. 1996. identification of functional elements of the chicken epsilon-globin promoter involved in stage-specific interaction with the beta/epsilon enhancer. *Journal of Biological Chemistry* 271(41): 25459-67.
- Bio Acc** Mason, R., Bakka, A., Samarawickrama, G. P., and Webb, M. metabolism of zinc and copper in the neonate: accumulation and function of (zinc, copper)-metallothionein in the liver of the newborn rat. *Br. J. Nutr.* (1981) 45(2): 375-89 .
- No Tox** Mason, R., Bakka, A., Samarawickrama, G. P., and Webb, M. 1981. metabolism of zinc and copper in the neonate: accumulation and function of (zn, cu)-metallothionein in the liver of the newborn rat. *British Journal of Nutrition* 45(2): 375-89.
- No Dose** Mason, R., Brady, F. O., and Webb, M. metabolism of zinc and copper in the neonate: accumulation of copper in the gastrointestinal tract of the newborn rat. *Br. J. Nutr.* (1981) 45(2): 391-9 .
- Abstract** Mason, R., Brady, F. O., and Webb, M. zinc and copper metabolism in neo nates function of metallo thionein in growth and development of the rat. *PACIFIC SCIENCE ASSOCIATION 15TH CONGRESS, DUNEDIN, NEW ZEALAND, FEB. 1-11, 1983. PAC SCI CONGR PROC.* 15 (1-2). 1983. 161.
- Fate** Mason, R. W. and Edwards, I. R. 1985. cisplatin-induced alteration of the copper and zinc content of the rat-kidney. *Biochemical Pharmacology* 34(14): 2575-2577.

- CP** Mason, R. W. and Edwards, I. R. 1985. cisplatin-induced change in the copper and zinc content of the rat-kidney. *Proceedings Of The University Of Otago Medical School* 63(1): 26-27.
- Nut def** Massaro, T. F., Mohs, M., and Fosmire, G. 1982. effects of moderate zinc deficiency on cognitive performance in young adult rats. *Physiology & Behavior* 29(1): 117-21 .
- Nut def** Massaro, Thomas F., Mohs, M., and Fosmire, G. effects of moderate zinc deficiency on cognitive performance in young adult rats. *Physiol. Behav. (1982)* 29(1): 117-21.
- Unrel** Masslich, W. J., Brotherson, J. D., and Cates, R. G. 1988. relationships of aspen (populus tremuloides) to foraging patterns of beaver (castor canadensis) in the strawberry valley of central utah. *Great Basin Naturalist* 48(2): 250-262.
- Plant** MASSLICH, W. J., BROTHERSON, J. D., and CATES, R. G. relationships of aspen populus-tremuloides to foraging patterns of beaver castor-canadensis in the strawberry valley of central utah usa. *GREAT BASIN NAT; 48 (2).* 1988. 250-262.
- CP** Masters, D. G. 1986. lack of effect of excess iron on zinc retention in the growing rat. *Proceedings of the Nutrition Society of Australia* 11: 130.
- Nut def** Masters, D. G., Chapman, R. E., and Vaughan, J. D. 1985. effects of zinc deficiency on the wool growth, skin and wool folliclesof pre-ruminant lambs. *Australian Journal of Biological Sciences* 38(4): 355-364.
- HHE** Masters, D. G., <Editors> J.M. Gawthorne, and others. 1982. low zinc and reproduction in the ewe. <document title>trace element metabolism in man and animals. 331-333.
- Nut def** Masters, D. G., Keen, C. L., Lonnerdal, B., and Hurley, L. S. 1986. release of zinc from maternal tissues during zinc deficiency or simultaneous zinc and calcium deficiency in the pregnant rat. *The Journal Of Nutrition.* 116(11): 2148-2154.
- Nut def** Masters, D. G., Keen, C. L., Lonnerdal, B., and Hurley, L. S. 1983. zinc deficiency teratogenicity: the protective role of maternal tissue catabolism. *Journal of Nutrition* 113(4): 905-12.
- Nut def** Masters, D. G. and Moir, R. F. provision of zinc to sheep by means of an intra ruminal pellet. *Australian Journal of Experimental Agriculture and Animal Husbandry.* 20 (106). 1980. 547-551.
- Nut def** Masters, D. G. and Moir, R. J. Dep. Animal Science and Production Univ. Western Australia Nedlands WA 6009 Australia. 1983. effect of zinc deficiency on the pregnant ewe and developing foetus. *British Journal of Nutrition.* V. 49(3) P. 365-372
- Surv** Masters, D. G., Purser, D. B., Yu, S. X., Wang, Z. S., Yang, R. Z., Liu, N., Lu, D. X., Wu, L. H., Ren, J. K., and Li, G. H. 1993. mineral nutrition of grazing sheep in northern china: ii. selenium, copper, molybdenum, iron and zinc in pasture, feed supplements and sheep. *Asian-Australasian Journal of Animal Sciences* 6(1): 107-113.
- Surv** Masters, D. G. and Somers, M. 1980. zinc status of grazing sheep: seasonal changes in zinc concentrationsin plasma, wool and pasture. *Australian Journal of Experimental Agriculture and Animal Husbandry* 20(102): 20-24.
- CP** Masters, D. Western Australia Univ. Nedlands. Dept. of Animal Science and Production, Fels, H. E. Western Australian Dept. of Agriculture Perth. Div. of Plant Research, Oldham, C. M., Pearce, D. T. Western Australia Univ. Nedlands. Dept. of Animal Science and Production, and Paterson, A. M. Western Australian Dept. of Agriculture Perth. Div. of Animal Production. 1983.

responses by grazing ewes to zinc supplementation [sheep]. [seminar paper]. proceedings of a seminar on reproduction in farm animals. P. 127-132

- Nut def** Masters, David G., Keen, Carl L., Loennerdal, Bo, and Hurley, Lucille S. comparative aspects of dietary copper and zinc deficiencies in pregnant rats. *J. Nutr.* (1983) 113(7): 1448-51.
- Nut def** Masters, David G., Keen, Carl L., Loennerdal, Bo, and Hurley, Lucille S. release of zinc from maternal tissues during zinc deficiency or simultaneous zinc and calcium deficiency in the pregnant rat. *J. Nutr.* (1986) 116(11): 2148-54.
- Nut def** Masters, David G., Keen, Carl L., Lonnerdal, Bo, and Hurley, Lucille S. zinc deficiency teratogenicity: the protective role of maternal tissue catabolism. *J. Nutr.* (1983) 113(4): 905-12.
- No COC** Mastrangelo Peter, Zwingman Theresa, Erickson Robert P, and Blecher Stan R= (A). 1994. zfy is transcribed in the normal mouse epididymis and in the xxsxr ("sex reversed") testis. *Developmental Genetics* 15(2): 129-138.
- No Dose** Masuda, H., Soejima, A., and Waide, Y. 1980. the association of protein agglutinating activity with some physical properties and chemical constituents in boar seminal plasma and secretions of accessory reproductive glands. *Japanese Journal of Animal Reproduction* 26(3): 121-125.
- Mix** Mathe, G., Blazsek, I., Canon, C., Gil-Delgado, M., and Misset, J. L. 1986. from experimental to clinical attempts in immunorestitution with bestatin and zinc. *Comparative Immunology, Microbiology and Infectious Diseases* 9(2-3)
- Phys** Mathew, B. M., Kumar, S., Ahmad, M. S., Seth, T. D., Hasan, M. Z., and Jamil, S. A. 1978. a temporal profile of myocardial zinc changes after isoproterenol induced cardiac necrosis. *Japanese Circulation Journal* 42(3): 353-7.
- Bact** Mathias, A., Deplazes, P., and Eckert, J. 1996. an improved test system for pcr-based specific detection of echinococcus multilocularis eggs. *Journal of Helminthology* 70(3): 219-222.
- Unrel** Mathieu, Jacques, Ferlat, Sylvie, Ballester, Bruno, Platel, Sandrine, Herodin, Francis, Chancerelle, Yves, Mestries, Jean-Claude, and Kergonou, Jean-Francois. radiation-induced apoptosis in thymocytes: inhibition by diethyldithiocarbamate and zinc. *Radiat. Res.* (1996) 146(6): 652-659.
- Gene** Mathieu, Jacques, Ferlat, Sylvie, Ferrand, Damien, Ballester, Bruno, Platel, Sandrine, Gerard, Valerie, Chancerelle, Yves, Mestries, Jean-Claude, and Kergonou, Jean-Francois. dna fragmentation induced in lymphocytes by .gamma. irradiation or dexamethasone: inhibition by diethyldithiocarbamate (dtc), potentiated by zinc. *Biochem. Mol. Biol. Int.* (1995) 36(4): 733-744
- Org Met** MATHUR, R. P. effectiveness of various rodent control measures in cereal crops and plantations in india. *BELGIAN JOURNAL OF ZOOLOGY; 127 (SUPPL.)*. 1997. 137-144.
- Unrel** Mathur, R. P. and Prakash, I. laboratory evaluation of chlorophacinone against tatera-indica and meriones-hurrianae. *TROP PEST MANAGE. Tropical Pest Management.* 28 (3). 1982. 291-294.
- Unrel** Matise, M. P., Epstein, D. J., Park, H. L., Platt, K. A., and Joyner, A. L. 1998. gli2 is required for induction of floor plate and adjacent cells, but not most ventral neurons in the mouse central nervous system. *Development* 125(15): 2759-70.

- No Oral** Matochik, J. A. 1988. role of the main olfactory system in recognition between individual spiny mice. *Physiology & Behavior* 42(3): 217-22.
- FL** Matosic-Cajavec, V. 1982. effect of virginiamycin for fattening chickens. *Poljoprivredna Znanstvena Smotra* 58: 93-109.
- FL** Matras, J., Bojarczyk, W., Rozaniecka, K., Wojtasik, J., and Wojcik, S. 1992. the influence of faba bean (*vicia faba*) supplement on nitrogen utilization, digestibility and blood indicators of ewes. *Annales Universitatis Mariae Curie-Sklodowska. Sectio EE Zootechnica* 10: 245-251.
- No COC** Matrone, Gennard, Tuggle, Betty C., and Ramsay, Peggy B. 1975. elucidation of the in vivo interactions of high levels of dietary zinc on synthesis of liver ferritin. *Proteins Iron Storage Transp. Biochem. Med. Proc. EMBO Workshop Conf.* 337-42. Editor(s): Crichton, Robert R. Publisher: North-Holland, Amsterdam, Neth.
- Org Met** Matschke G H, Fagerstone K A, Halstead N D, LaVoie G K, and Otis D L. 1982. population reduction of richardson's ground squirrels with zinc phosphide. *JOURNAL OF WILDLIFE MANAGEMENT* 46. 119(3): 671-677, illustr.
- Org Met** Matschke, G. H., Fagerstone, K. A., Halstead, N. D., Lavoie, G. K., and Otis, D. L. population reduction of richardson's ground squirrels *spermophilus-richardsonii* with zinc phosphide. *Journal of Wildlife Management.* 46 (3). 1982. 671-677.
- Org Met** Matschke, G. H., Marsh, M. P., and Otis, D. L. efficacy of zinc phosphide broadcast baiting for controlling richardson's ground squirrels *spermophilus-richardsonii* on rangeland. *J RANGE MANAGE. Journal of Range Management.* 36 (4). 1983. 504-506.
- No COC** Matschke, G. H. Fagerstone K. A. Halstead N. D. Lavoie G. K. and Otis D. L. 1982. population reduction of richardson's ground squirrels with zinc phosphide. *J.Wildl.Manag.* 46(3): 671-677.
- QAC** Matsubara, J., Ishioka, K., Egawa, J., Inada, T., and Machida, K. 1982. protective effect of zinc against lethality of the irradiated mice. *Proc. - Soc. Radiol. Prot. Int. Symp.: Radiol. Prot.--Adv. Theory Pract., 3rd* : Volume 1, 358-63 Publisher: Soc. Radiol. Prot., London, UK.
- No Oral** Matsubara, J., Tajima, Y., and Karasawa, M. 1987. promotion of radioresistance by metallothionein induction prior to irradiation. *Environmental Research* 43(1): 66-74.
- Mix** Matsubara, Junko, Ishioka, Kuniaki, Shibata, Yoshisada, and Kato, Kazuaki. risk analysis of multiple environmental factors: radiation, zinc, cadmium, and calcium. *Environ. Res. (1986)* 40(2): 525-30 .
- QAC** Matsubara, Junko Univ of Tokyo Japan, Shida, Toshitomo, Ishioka, Kuniaki, Egawa, Sunao, Inada, Tetsuo, and Machida, Kazuhiko. protective effect of zinc against lethality in irradiated mice. *Environ Res.* V41, N2, P558(10)
- FL** Matsuda, Akihiko, Kimura, Mieko, Yokoi, Katsuhiko, Kabata, Hisaaki, Itokawa, Yoshinori, Kataoka, Mikiko, and Sato, Makoto. effects of total parenteral nutrition containing essential trace elements on their concentrations in rats. *Nippon Eiseigaku Zasshi (1989)* 43(6): 1140-8.
- Drug** Matsuda, K., Nishi, N., Hiramatsu, Y., Shimizu, M., Ohta, T., and Kato, M. reproductive and developmental toxicity studies on catenane-s-mu-n-alpha-3-aminopropionylhistidinato-n-1 n-2 o n-tau-zinc. *ARZNEIM-FORSCH. Arzneimittel-Forschung.* 41 (10). 1991. 1042-1048.
- FL** Matsui, T., Susaki, H., Tamura, A., Yano, H., Nakajima, T., Matsuda, M., and Yano, F. 1998. the

improvement of zinc bioavailability in fermented soybean meal ingrowing pigs. *Animal Science and Technology* 69(6): 589-591.

- In Vit** Matsumoto, H., Silverton, S. F., Debolt, K., and Shapiro, I. M. 1991. superoxide dismutase and catalase activities in the growth cartilage: relationship between oxidoreductase activity and chondrocyte maturation. *Journal of Bone and Mineral Research* 6(6): 569-74.
- Drug** Matsumoto, T. and Dobek, A. S. 1968. *Systemic Antibiotic(S) in Contaminated Crush Wound Without Debridement* : 4p.
- FL** Matsuno, Z. 1971. [histological studies on the pancreatic islets of langerhans of rabbits after long-term glycodiazine administration]. *Nippon Naibunpi Gakkai Zasshi* 47(3): 165-73.
- Chem Meth** Matsuo, O., Okada, K., Fukao, H., Suzuki, A., and Ueshima, S. 1992. cerebral plasminogen activator activity in spontaneously hypertensive stroke-prone rats. *Stroke* 23(7): 995-9.
- Invert** Matsuo, Takashi, Ooe, Sakurao, and Ishikawa, Yukio. 1997. limitation of dietary copper and zinc decreases superoxide dismutase activity in the onion fly, *delia antiqua*. *Comp. Biochem. Physiol. A: Physiol. A: Physiol.* 117 A(2): 191-195 .
- No Oral** Matsuoka Masato(A), Igisu Hideki(A), Tanaka Isamu, Hori Hajime, and Koga Minoru. 1993. brain energy metabolites in mice after an acute exposure to carbon monoxide. *Research Communications in Chemical Pathology and Pharmacology* 81(1): 15-20.
- Fate** MATSUSAKA, N. uptake of 65zn in the mouse fetus as a function of gestational age. *RADIAT RES* 69:83-89,1977
- CP** Matsusaka, N., Berg, D., and Kollmer, W. E. 1985. influence of changing zinc supply on zinc-65 absorption and retention in rats. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th* : Meeting Date 1984, 394-7. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK.
- CP** Matsusaka, N., Berg, D., and Kollmer, W. E. influence of changing zn supply on 65zn absorption and retention in rats. *Trace Elements In Man And Animals : Tema 5 : Proceedings Of The Fifth International Symposium On Trace Elements In Man And Animals / Editors C.f. Mills, I. Bremner, & J.k. Chesters.* p. 394-397.
- Abstract** MATSUSAKA, N., BERG, D., and KOLLMER, W. E. 1984. relationship between whole-body retention of zinc-65 and dietary zinc levels in rats. *27TH ANNUAL MEETING OF THE JAPAN RADIATION RESEARCH SOCIETY*
- Nut def** Matsusaka, N., Ise, H., Sakamoto, H., Shinagawa, K., Berg, D., and Kollmer, W. E. influence of zinc deficiency on the whole-body retention of zinc-65 in young and adult mice. *Japanese Journal of Veterinary Science.* 50 (4). 1988. 966-967.
- FL** MATSUSAKA, N., NAKAMURA, I., and ICHIKAWA, R. zinc-65 uptake in the rat fetus and the organ distribution of zinc-65 in pregnant female and in male rats. *IGAKU TO SEIBUTSUGAKU (MED BIOL)* 87:227-230,1973
- Nut def** Matsusaka, N. and Nishimura, Y. zinc-65 absorption and its turnover in young and adult mice under supply of zinc deficient diet. *Trace Elem. Man Anim. 7: Monogr. Proc., Round Tables Discuss. Int. Symp., 7th* : Meeting Date 1990, 19-9-19/10. Editor(s): Momcilovic, Berislav. Publisher: Inst. Med. Res. Occup. Health Univ. Zagreb, Zagreb, Yugoslavia..
- Unrel** Matsusaka, N., Sakamoto, H., Sato, I., Shinagawa, K., Kobayashi, H., and Nishimura, Y. 1995.

whole-body retention and fetal uptake of ⁶⁵zn in pregnant mice fed a zn-deficient diet. *Journal of Radiation Research* 36(3): 196-202.

- No Dose** Matsusaka, N., Shinagawa, K., Kobayashi, H., Yuyama, A. Iwate Univ. Morioka Japan Faculty of Agriculture, and Matsuda, Y. 1981. zn-65 uptake and its distribution in mouse and rat fetuses. *Journal of the Faculty of Agriculture - Iwate University*. V. 15(4) P. 279-285
- No Oral** Matsusaka, Naonori. transfer of zinc-65 through placenta and milk in mice. *Radioisotopes* (1974) 23(3): 186-7
- Nut def** Matsusaka, Naonori, Ise, Hiroaki, Sakamoto, Hideki, Shinagawa, Kunihiro, Berg, Dieter, and Kollmer, Willy E. 1988. effect of zinc deficiency on the whole-body zinc retention in young and adult mice. *Jpn. J. Vet. Sci.* 50(4): 966-7.
- No Oral** Matsushita Kohji(A), Kitagawa Kazuo, Matsuyama Tomohiro, Ohtsuki Toshiho, Taguchi Akihiko, Mandai Kenji, Mabuchi Takuma, Yagita Yoshiki, Yanagihara Takehiko, and Matsumoto Masayasu. 1996. effect of systemic zinc administration on delayed neuronal death in the gerbil hippocampus. *Brain Research* 743(1-2): 362-365.
- In Vit** Matsushita, M., Hayakawa, Y., and Sawada, Y. fractal structure and cluster statistics of zinc-metal trees deposited on a line electrode. *Phys. Rev. A: Gen. Phys.* (1985) 32(6): 3814-16.
- CP** Matsuyama Shigemi(A), Chang Kyu Tae, Yoshida Shintarou, Nishihara Masugi, and Takahashi Michio. 1995. isolation of programmed cell death related genes from rat corpus luteum. *Biology of Reproduction* 52(SUPPL. 1): 67.
- FL** Mattes, S. ed. 1997. 10. symposium on housing and diseases of rabbits, furbearing animals and pet animals (celle (germany), 14-15 may 1997). <original> [10. symposium sur le logement et les maladies des lapins, animaux a fourrure et animaux de compagnie (celle (allemagne), 14-15 mai 1997)]. *World Rabbit Science*. V. 5(4) P. 129-133
- No COC** Mattsson, C., Marklund, S. L., and Hellstrom, S. 1997. application of oxygen free radical scavengers to diminish the occurrence of myringosclerosis. *Annals of Otology, Rhinology, and Laryngology* 106(6): 513-8.
- Alt** Matuo, Y., Nishi, N., Tanaka, Y., Muguruma, Y., Tanaka, K., Akatsuka, Y., Matsui, S. I., Sandberg, A. A., and Wada, F. 1984. changes of an androgen-dependent nuclear protein during functional differentiation and by dedifferentiation of the dorsolateral prostate of rats. *Biochemical and Biophysical Research Communications* 118(2): 467-73.
- FL** Matyaev, V. and Maksimov, S. 1998. premix for pregnant sows. *Svinovodstvo (Moskva)* (6): 22-24.
- CP** Maurer, R. R. and Echternkamp, S. E. factors associated with embryonic development in twice open repeat breeder beef cows. *MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE, SOUTHERN SECTION, ATLANTA, GA., USA, FEB. 1-4, 1981. J ANIM SCI.* 53 (Suppl. 1). 1981 (Recd. 1982). 107.
- No COC** Maurice, D. V., Bodine, A. B., and Rehner, N. J. 1983. metabolic effects of low aflatoxin b1 levels on broiler chicks. *Applied and Environmental Microbiology* 45(3): 980-4.
- Nut** Maurice, D. V., Jones, J. E., Dillon, C. R., and Weber, J. M. chemical composition and nutritional value of brazilian elodea (egeria densa) for the chick. *Poult. Sci.* (1984) 63(2): 317-23.

- Nut** Maust, L. E., Pond, W. G., and Scott, M. L. 1972. energy value of a cassava-rice bran diet with and without supplemental zinc for growing pigs. *Journal of Animal Science* 35(5): 953-957.
- FL** Mavaeva, E. N. and Rish, M. A. antagonism of zinc and copper as one of the factors contributing to the development of anemia. *Tr. Samarkand. Gos. Univ. (1972)* : No. 193, 75-84.
- Unrel** May, J. D., Malone, G. W., Chaloupka, G. W., Merkley, J. W., and Huff, W. E. 1982. the effect of floor type on the development of breast blisters and feather follicle infections in broilers. *Poultry Science* 61(2): 250-4.
- Bio Acc** Mayari, R. and Colome, H. 1984. plasma concentrations of zinc and copper in calves at different ages. *Revista De Salud Animal* 6(2): 227-236.
- FL** Mayari, R. and Colome, H. Centro Nacional de Sanidad Agropecuaria La Habana Cuba Dept. de Metabolismo. 1984. zinc and copper plasma levels in developing calves. <original> niveles plasmaticos de cinc y cobre en terneros en desarrollo. *Revista De Salud Animal*. V. 6(2) P. 227-236
- No Oral** Mayer, A. D. and Rosenblatt, J. S. effects of intra nasal zinc sulfate on open field and maternal behavior in female rats. *Physiology & Behavior*. 18 (1). 1977 101-109.
- No COC** Mayer, A. D. and Rosenblatt, J. S. olfactory basis for the delayed onset of maternal behavior in virgin female rats experiential effects. *Journal of Comparative and Physiological Psychology*. 89 (7). 1975 701-710.
- No Oral** Mayer, Anne D. and Rosenblatt, Jay S. 1993. peripheral olfactory deafferentation of the primary olfactory system in rats using zinc sulfate nasal spray with special reference to maternal behavior. *Physiol. Behav.* 53(3): 587-92 .
- HHE** MAYS, C. W., TAYLOR, G. N., and FISHER, D. R. estimated toxicity of ca-dtpa to the human fetus. *HEALTH PHYS* 30:247-249,1976
- No COC** Mazgutov, V. Z. and Kudrin, A. N. changes in the content of selenium and other trace elements in albino rat organs and tissues during experimental hypotrophy and after sodium selenite treatment. *Farmatsiya (Moscow)* (1987) 36(4): 49-54 .
- FL** Mazhul', L. M. some patterns of lipid peroxidation in blood of old rats with alloxan diabetes. *Voprosy Meditsinskoi Khimii*. 33 (2). 1987. 41-44.
- Nut** Maziya-Dixon, B. B. and Klopfenstein, C. F. nutritional properties of hard white and hard red winter wheats and oatmeal. ii. effects on fecal water-holding capacity and loss of protein, ash, calcium, and zinc in cholesterol-fed rats. *Cereal Chem.* (1994) 71(6): 544-7.
- FL** Mazurczak, Jerzy, Harenza, Tadeusz, Piotrowska, Janina, and Węgorzewska, Genowefa. 1975. trial evaluation of the effect of copper sulfate as a rat growth stimulator. *Zesz. Nauk. Szk. Gl. Gospod. Wiejsk.-Akad. Roln. Warszawa Weter.* 6: 23-34.
- Nut** Mazurenko, N. A., Zhurenko, V. K., and Kurnaev, A. N. 1991. phosphorus-containing liquid feed supplement for young male cattle. *Zootekhniya* (10): 42-44.
- Unrel** Mazurkiewicz, Michal, Grys, Stanislaw, Klimentowski, Stanislaw, and Gawel, Andrzej. the effect of carotenoids on some indices of cellular immunity in slaughter cocks receiving feed of high vitamin a content. *Pol. Arch. Weter.* (1990) 30(1-2): 117-26.
- Abstract** Mc Cuaig L W and Motzok, I. effects of dietary calcium on intestinal alkaline phosphatase and

intestinal and plasma calcium zinc and phosphate levels. *Federation Proceedings*. 31 (2). 1972
721

- Nut def** McBean, L. D., Smith, J. C. Jr, and Halsted, J. A. 1972. zinc deficiency in guinea pigs. 1. *Proceedings of the Society for Experimental Biology and Medicine*; 140
- Nut def** McBean, Lois D., Smith, J. Cecil Jr., and Halsted, James A. zinc deficiency in guinea pigs. *Proc. Soc. Exp. Biol. Med.* (1972) 140(4): 1207-9 .
- Drug** McBean, Lois D., Smith, James Cecil Jr., and Halsted, James A. 1971. effect of oral contraceptive hormones on zinc metabolism in the rat. *Proc. Soc. Exp. Biol. Med.* 137(2): 543-7 .
- Bio Acc** McBride-Warren, P. A., Brown, R. G., and McCutcheon, J. 1979. alaskan malamute chondrodysplasia. vii. isolation and characterization of copper, zinc and iron binding proteins in canis familiaris. *Comparative Biochemistry and Physiology* 64B(2): 187-193.
- Abstract** Mccalla, J. M(A), Gallaher, D. D(A), Johnston, L. J., Whitney, M. H(A), and Shurson, G. C(A). 1999. evaluation of the optimal growth promoting level of dietary zn from a zn amino acid complex for weanling pigs. *Journal of Animal Science* 77(SUPPL. 1): 64.
- Diss** McCarthy, Patrick Vincent. 1988. investigation of dietary zinc and linoleic acid interactions in the sprague-dawley rat. Avail.: *Univ. Microfilms Int. Order No. DA8921281 From: Diss. Abstr. Int. B* 1989, 50. 6. 2345 : 132 pp.
- Unrel** McCarty, M. F. 1983. nutritional modulation of mineralocorticoid and prostaglandin production: potential role in prevention and treatment of gastric pathology. *Medical Hypotheses* 11(4): 381-9.
- Rev** McClain, C. J., Antonow, D. R., Cohen, D. A., and Shedlofsky, S. I. 1986. zinc-metabolism in alcoholic liver-disease. *Alcoholism-Clinical And Experimental Research* 10(6): 582-589.
- Nut def** McClain, C. J., Gavalier, J. S., and Thiel, D. H. Van. 1984. hypogonadism in the zinc-deficient rat: localization of the functional abnormalities. *Journal of Laboratory and Clinical Medicine* 104(6): 1007-1015.
- Nut def** McClain, C. J., Kasarskis, E. J., and Allen, J. J. 1985. functional consequences of zinc-deficiency. *Progress In Food And Nutrition Science* 9(1-2): 185-226.
- Abstract** McClain, C. J., Swanson, D., and Cameron, D. effect of biotin deficiency on the squamous epithelium of the cornea and skin in man and rats. *50TH ANNUAL MEETING OF THE MIDWEST SECTION OF THE AMERICAN FEDERATION FOR CLINICAL RESEARCH, CHICAGO, ILL., USA, NOV. 4-6, 1982. CLIN RES.* 30 (4). 1982. 716a.
- Nut def** McClain, P. E., Pearson, A. M., Miller, E. R., and Dugan, L. R. Jr. application of inst differential thermal analysis to the study of hydrothermal shrinkage in epimysial and corium collagen pig cow zinc deficient diet. *BIOCHIM BIOPHYS ACTA. Biochimica Et Biophysica Acta.* 168 (1). 143-149. 1968.
- Nut def** McClain, P. E., Wiley, E. R., Beecher, G. R., Anthony, W. L., and Hsu, J. M. influence of zinc deficiency of synthesis and crosslinking of rat skin collagen. *Biochim. Biophys. Acta* (1973) 304(2): 457-65.
- Nut def** McClain, P. E., Wiley, E. R., Beecher, G. R., Anthony, W. L., and Hsu, J. M. 1973. influence of zinc deficiency on synthesis and cross-linking of rat skin collagen. *Biochimica Et Biophysica*

Acta 304(2): 457-465.

- Nut def** McConnell, K. P., Hsu, Jeng M., Herrman, J. L., and Anthony, W. L. parallelism between sulfur and selenium amino acids in protein synthesis in the skin of zinc-deficient rats. *Proc. Soc. Exp. Biol. Med.* (1974) 145(3): 970-4.
- Nut def** McConnell, S. D. and Henkin, R. I. altered preference for sodium chloride, anorexia, and changes in plasma and urinary zinc in rats fed a zinc deficient diet. *J. Nutr.* (1974) 104(9): 1108-14
- CP** McCormick, C. C. a marked interaction of a high fat diet and zinc deficiency on growth and mortality of young chicks. *68TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 1-6, 1984 FED PROC.* 43 (3). 1984. Abstract 2347.
- CP** McCormick, C. C. 1984. the tissue-specific accumulation of hepatic zinc metallothionein following parenteral iron loading. *Proceedings of the Society for Experimental Biology and Medicine*; 176
- CP** McCormick, C. C. and Cunningham, D. L. a direct comparison of equal periods of high zinc feeding and fasting as methods of forced resting. *73RD ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC. POULT SCI.* 63 (Suppl. 1). 1984. 147.
- No Control** McCormick, C. C. and Cunningham, D. L. 1984. forced resting by high dietary zinc: tissue zinc accumulation and reproductive organ weight changes. *Poultry Science* 63(6): 1207-12.
- CP** McCormick, Charles C. and Cunningham, Dan L. forced molting of laying hens by zinc toxicity. *Proc. - Cornell Nutr. Conf. Feed Manuf.* (1982) 17-24
- No Control** McCormick, Charles C. and Cunningham, Dan L. 1984. high dietary zinc and fasting as methods of forced resting: a performance comparison. *Poult. Sci.* 63(6): 1201-6 .
- CP** McCormick, Charles C. and Cunningham, Dan L. inducing molt with dietary zinc oxide. *Proc. - Cornell Nutr. Conf. Feed Manuf.* (1983) 69-74
- No Control** McCormick, Charles C. and Cunningham, Dan L. 1987. performance and physiological profiles of high dietary zinc and fasting as methods of inducing a forced rest: a direct comparison. *Poult. Sci.* 66(6): 1007-13 .
- Acu** McCormick, Charles C., Menard, Michael P., and Cousins, Robert J. induction of hepatic metallothionein by feeding zinc to rats of depleted zinc status. *Am. J. Physiol.* (1981) 240(4): E414-E421 .
- In Vit** McCuaig, L. 1976. interference by divalent metals in the preparation of soluble intestinal alkaline phosphatase with n-butanal. *Preparative Biochemistry* 06(04): 295-306.
- FL** McCuaig, L. W. and Motzok, I. 1974. interactions of ca, p, zn, and alkaline phosphatase in the chick. ii. effect of dietary ca level. *Canadian Journal of Physiology and Pharmacology* 52(1): 90-5.
- Nut** McCuaig, L. W. and Motzok, I. 1973. interactions of calcium, phosphorus, zinc, and alkaline phosphatase in the chick. i. methodological considerations and preliminary findings. *Poult. Sci.* 52(5): 1896-902.
- Nut def** McCuaig, L. W. and Motzok, I. interactions of calcium, phosphorus, zinc, and alkaline phosphatase in the chick. iii. effects of dietary phosphate, sodium chloride, and theophylline.

Comp. Biochem. Physiol. A (1974) 48(4A): 663-74.

- Rev** McCusker, R. H. 1998. controlling insulin-like growth factor activity and the modulation of insulin-like growth factor binding protein and receptor binding. *Journal of Dairy Science* 81(6): 1790-1800.
- No Oral** McDermott, J. L. and Dluzen, D. E. effects of olfactory bulbectomy and zinc sulfate induced anosmia on reproductive and related behaviors in the male mongolian gerbil *Meriones unguiculatus*. *BIOL BEHAV. Biology of Behaviour.* 7 (2). 1982. 91-100.
- Nut** McDonald, R. C. and Wilson, K. R. 1980. dry matter yields, digestibilities, mineral levels, and cattle growth rates on greenfeed oats at different stages of development. *New Zealand Journal of Experimental Agriculture* 8(2): 105-109.
- Drug** McDougald, L. R., Reid, W. M., Taylor, E. M., and Mabon, J. L. 1972. effects of anticoccidial and growth promoting agents on intestinal motility in broilers. *Poultry Science* 51(2): 416-8.
- Mineral** McDowell, L. R. and <Editors> Blair, R. 1996. feeding minerals to cattle on pasture. *Animal Feed Science and Technology* 60(3/4): 247-271.
- Nut def** McDowell, L. R., Froseth, J. A., Piper, R. C., Dyer, I. A., and Kroening, G. H. 1977. tissue selenium and serum tocopherol concentrations in deficient pigs fed peas (*Pisum sativum*). *Journal of Animal Science* 45(6): 1326-1333.
- No COC** Mcevoy, R. C., Schmitt, R. V., and Hegre, O. D. syngeneic transplantation of fetal rat pancreas part 1 effect of insulin treatment on the reversal of alloxan diabetes. *Diabetes.* 27 (10). 1978. 982-987.
- Unrel** McEwan, N. A. Department of Veterinary Medicine University of Glasgow Veterinary Glasgow United Kingdom. 1990. lethal acrodermatitis of bull terriers. <subtitle> [correspondence]. *Veterinary Record.* V. 127(4) P. 95
- Phys** McFadden, S. L., Ding, D., Reaume, A. G., Flood, D. G., and Salvi, R. J. 1999. age-related cochlear hair cell loss is enhanced in mice lacking copper/zinc superoxide dismutase. *Neurobiology of Aging* 20(1): 1-8.
- No COC** McGinty, Elizabeth A., Neafsey, Patricia J., Stake, Paul E., Wyand, D. Stuart, and Lammi-Keefe, Carol J. the effect of ethanol consumption on trace mineral status in elderly rats. *Nutr. Res. (N. Y.)* (1986) 6(9): 1095-109.
- Alt** McGinty, J. F., Kanamatsu, T., Hong, J. S., Morton, J. D., and Frederickson, C. J. seizure-induced alterations of opioid peptide and zinc metabolism in the hippocampus of rats. *Nutritional Modulation Of Neural Function / Edited By John E. Morley, M. Barry Serman, John H. Walsh.* p. 271-287. ill.
- No Oral** McGregor, A. and Herbert, J. the effects of beta endorphin infusions into the amygdala on visual and olfactory sensory processing during sexual behaviour in the male rat. *Neuroscience.* 46 (1). 1992. 173-180.
- Not Avail** McIntosh, J E A and Lutwak-Mann, C. zinc transport in rabbit tissues: some hormonal aspects of the turnover of zinc in female reproductive organs, liver and body fluids. *Biochem J* Feb 1972 126 (4): 869-876. Ref.
- Mix** McKenna, I. M., Chaney, R. L., Tao, S. H., Leach, R. M. Jr., and Williams, F. M. 1992. interactions of plant zinc and plant species on the bioavailability of plant cadmium to Japanese

quail fed lettuce and spinach. *Environmental Research*. 57(1): 73-87.

- Abstract** McKenna, L., Kearney, R. D., Flynn, A., Cremin, F. M., and Connolly, J. F. bioavailability of zinc from whey calcium phosphate complex. *14TH ANNUAL FOOD SCIENCE AND TECHNOLOGY RESEARCH CONFERENCE, CORK, IRELAND, SEPT. 5-7, 1984. IR J FOOD SCI TECHNOL.* 8 (2). 1984 (Recd. 1985). 152.
- CP** McKenzie, J. M. and Davies, N. T. influence of dietary protein on zinc availability from bread in rats. *Proceedings ... Symposium On Trace Element Metabolism In Man And Animals*. 1981 (pub. 1982). 1981 (pub. 1982). (4th) p. 111-113.
- Nut def** McKenzie, J. M., Fosmire, G. J., and Sandstead, H. H. 1975. zinc deficiency during the latter third of pregnancy: effects on fetal rat brain, liver, and placenta. *Journal of Nutrition* 105(11): 1466-75.
- CP** McKenzie, Joan M. and Davies, Neill T. 1982. influence of dietary protein on zinc availability from bread in rats. *Trace Elem. Metab. Man Anim. Proc. Int. Symp., 4th* : Meeting Date 1981, 111-13. Editor(s): Gawthorne, J. M.; Howell, J. McC.; White, C. L. Publisher: Springer, Berlin, Fed. Rep. Ger.
- Nut def** McKenzie, Joan M., Fosmire, Gary J., and Sandstead, Harold H. zinc deficiency during the latter third of pregnancy. effects on fetal rat brain, liver, and placenta. *J. Nutr.* (1975) 105(11): 1466-75.
- Nut def** McKenzie, Joan M., Fosmire, Gary J., and Sandstead, Harold H. zinc deficiency in the prenatal rat. *Proc. N. D. Acad. Sci.* (1976) : 28, Pt. 2, 79-85.
- HHE** Mckenzieparnell, J. M. and Thomson, C. D. 1987. zinc, copper, selenium, and glutathione-peroxidase in blood of 11-yr-old dunedin, new-zealand children. *Biological Trace Element Research* 14(1-2): 53-63.
- BioX** Mckie Norman, Dando Pamela M, Brown Molly A, and Barrett Alan J. 1995. rat thimet oligopeptidase: large-scale expression in escherichia coli and characterization of the recombinant enzyme. *Biochemical Journal* 309(1): 203-207.
- In Vit** McLardy, T. 1970. intravital nontoxic sulfide loading of synaptic zinc in hippocampus. *Experimental Neurology* 28(3): 416-9.
- In Vit** McLardy, T. 1970. memory consolidations in rats with sulfide-loaded hippocampal zinc-rich synapses. *Experimental Neurology* 29(3): 468-72.
- Nut def** McLaughlan, J. M., Beare-Rogers, J. L., Jones, J. D., and Shah, B. G. zinc inadequacy of mineral mixtures in protein quality assays for rapeseed protein concentrate. *Nutr. Rep. Int.* (1977) 15(3): 331-6.
- Nut def** McLaughlan, J. M., Beare-Rogers, J. L., Jones, J. D., and Shah, B. G. CS Ottawa Canada. 1977. zinc inadequacy of mineral mixtures in protein quality assays for rapeseed protein concentrate. *Nutrition Reports International* 15(3): 331-336.
- Nut def** McLaughlan, J. M., Jones, J. D., Shah, B. G., and Beare-Rogers, J. L. reproduction in rats fed protein concentrate from mustard or rapeseed. *Nutr. Rep. Int.* (1975) 11(4): 327-35.
- No Oral** McLaughlin, C. L., Hedrick, H. B., Veenhuizen, J. J., Hintz, R. L., Munyakazi, L., Kasser, T. R., and Baile, C. A. 1994. performance, clinical chemistry, and carcass responses of finishing lambs to formulated sometribove (methionyl bovine somatotropin). *Journal of Animal Science*

72(10): 2544-2551.

- Phys** McLaughlin, C. R., Tao, Qing, and Abood, M. E. 1994. isolation and developmental expression of a rat cdna encoding a cysteine-rich zinc finger protein. *Vol. 22, No. 24, Pp. 5477-5483 Nucleic Acids Res.*
- Food** McLean, J. A. and Speakman, J. R. 1995. elimination rate of ⁶⁵zn as a measure of food intake: a validation study in the mouse (mus sp.). *Journal of Applied Physiology* 79(4): 1361-9.
- Phys** McMahon, A. P., Champion, J. E., McMahon, J. A., and Sukhatme, V. P. developmental expression of the putative transcription factor egr-1 suggests that egr-1 and c-fos are coregulated in some tissues. *DEVELOPMENT (CAMB). DEVELOPMENT (Cambridge). 108 (2). 1990. 281-288.*
- Fate** McMahon, Robert J. and Cousins, Robert J. regulation of the zinc transporter znt-1 by dietary zinc. *Proc. Natl. Acad. Sci. U. S. A. (1998) 95(9): 4841-4846.*
- Nut** McMaster, D., Ewing, A. S., Erwin, C., McBriar, D. L., and Love, A. H. G. the influence of dietary vitamins on zinc uptake from the lumen of the perfused rat gut. *Nutrition Research. 1985. (suppl. 1) p. 267-270.*
- No Oral** McMaster, D. Ewing A. S. Erwin C. McBriar D. L. and Love A. H. G. 1985. the influence of dietary vitamins on zinc uptake from the lumen of the perfused rat gut. *Nutr.Res. Suppl.I: 267-270.*
- CP** McMaster, Dorothy, Steel, Linda, and Love, A. H. G. 1982. zinc absorption by vascularly perfused small intestine. *Trace Elem. Metab. Man Anim. Proc. Int. Symp., 4th : Meeting Date 1981, 121-4. Editor(s): Gawthorne, J. M.; Howell, J. McC.; White, C. L. Publisher: Springer, Berlin, Fed. Rep. Ger.*
- Nut def** McMaster, Dorothy, Steel, Linda, and Love, Andrew H. G. the isolated, vascularly perfused, small intestine of the rat : a useful tool for the study of absorption in nutritional deficiency. *Ir. J. Med. Sci. (1983) 152(9): 329-35.*
- Surv** McMeniman, N. P., Beale, I. F. Queensland Dept. of Primary Industries Charleville Australia, and Payne, G. Queensland Dept. of Primary Industries Blackall Australia. 1989. the nutrient status of sheep grazing on a dry mitchell grass pasture association in central-western queensland. *Australian Rangeland Journal. V. 11(1) P. 7-14*
- In Vit** Mcmillan, James I, Riordan, John W, Couser, William G, Pollock, Allan S, and Lovett, David H A. 1996. characterization of a glomerular epithelial cell metalloproteinase as matrix metalloproteinase-9 with enhanced expression in a model of membranous nephropathy. *Journal of Clinical Investigation* 97(4): 1094-1101.
- Abstract** McMurray, D. N., Carlomagno, M. A., and Cumberland, P. A. effect of dietary protein and zinc deficiencies on experimental respiratory infection with attenuated mycobacteria. *83RD ANNUAL MEETING OF THE AMERICAN SOCIETY FOR MICROBIOLOGY, NEW ORLEANS, LA., USA, MAR. 6-11, 1983. ABSTR ANNU MEET AM SOC MICROBIOL. 83 (0). 1983. E60.*
- Nut def** McMurray, D. N., Carlomagno, M. A., and Cumberland, P. A. 1983. respiratory infection with attenuated mycobacterium tuberculosis h37ra in malnourished guinea pigs. *Infection and Immunity* 39(2): 793-9.
- Biom** McMurray, D. N., Carlomagno, M. A., and Mintzer, C. L. 1988. effect of diet on non-specific antimicrobial resistance in mycobacterium bovis bcg-vaccinated guinea pigs. *Nutrition Research*

8(10): 1171-1181.

- Drug** McMurray, D. N. and Yetley, E. A. 1983. response to mycobacterium bovis bcg vaccination in protein- and zinc-deficient guinea pigs. *Vol. 39, No. 2, Pp. 755-761 Infect. Immun.*
- Nut def** McMurray, D. N. and Yetley, E. A. 1983. response to mycobacterium-bovis bcg vaccination in protein-deficient and zinc-deficient guinea-pigs. *Infection And Immunity* 39(2): 755-761.
- Nut def** McMurray, David N., Bartow, Rebecca A., Mintzer, Carole L., and Hernandez-Frontera, Evaurely. micronutrient status and immune function in tuberculosis. *Ann. N. Y. Acad. Sci. (1990)* 587(Micronutr. Immune Funct./Cytokines Metab.): 59-69.
- Bact** McMurray, David N., Carlomagno, Mirta A., and Powanda, Michael C. 1986. effect of dietary zinc and pulmonary listeriosis on biochemical indicators of infection. *Nutr. Rep. Int.* 33(1): 5-11.
- CP** McNall, A. D(A), Etherton, T. D., and Fosmire, G. J. 1995. growth hormone (gh) does not affect serum insulin-like growth factor-i (igf-i) and hepatic igf-i mrna levels in zinc deficient, female rats. *FASEB Journal* 9(4): A737.
- Nut def** McNall, Amy D., Etherton, Terry D., and Fosmire, Gary J. the impaired growth induced by zinc deficiency rats is associated with decreased expression of the hepatic insulin-like growth factor i and growth hormone receptor genes. *J. Nutr. (1995)* 125(4): 874-9.
- Nut def** McQuitty, James T. Jr., DeWys, William D., Monaco, Liberatore, Strain, William H., Rob, Charles G., Apgar, Jean, and Pories, Walter J. inhibition of tumor growth by dietary zinc deficiency. *Cancer Res. (1970)* 30(5): 1387-90.
- HHE** Meadows, N., Ruse, W., Keeling, P. W. N., Scopes, J. W., and Thompson, R. P. H. 1983. peripheral-blood leukocyte zinc depletion in babies with intrauterine growth-retardation. *Archives Of Disease In Childhood* 58(10): 807-809.
- HHE** Meadows, N. J., Grainger, S. L., Ruse, W., Keeling, P. W. N., and Thompson, R. P. H. 1983. oral iron and the bioavailability of zinc. *British Medical Journal* 287(6398): 1013-1014.
- HHE** Medeiros, D., Pllum, L., and Brown, B. 1983. serum-lipids and glucose as associated with hemoglobin levels and copper and zinc intake in young-adults. *Life Sciences* 32(16): 1897-1904.
- HHE** Medeiros, D. M. and Brown, B. J. 1983. blood-pressure in young-adults as influenced by copper and zinc intake. *Biological Trace Element Research* 5(3): 165-174.
- Mineral** Medeiros Denis M(A), Illich Jasminka, Ireton John, Matkovic Velimir, Shiry Laura, and Wildman Robert. 1997. femurs from rats fed diets deficient in copper or iron have decreased mechanical strength and altered mineral composition. *Journal of Trace Elements in Experimental Medicine* 10(3): 197-203.
- Mineral** Medeiros, L. C., Russell, W. C., Stobart, R. H., Riley, M. L., and West, S. 1989. iron and zinc content of ovine muscle after dietary zinc-methioninesupplementation. *Nutrition Reports International* 40(3): 509-516.
- Species** Medici, John C. and Taylor, Milton Wight. interrelations among copper, zinc, and cadmium in the diet of the confused flour beetle. *J. Nutr. (1967)* 93(3): 307-9 .
- Abstract** Medina, C. A., Scherle, P. A., King, L. E., and Fraker, P. J. alterations of b cell development in

bone marrow by zinc deprivation. 69TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ANAHEIM, CALIF., USA, APR. 21-26, 1985. *FED PROC.* 44 (4). 1985. 977.

- In Vit** Medina, Juan F., Wetterholm, Anders, Raadmark, Olof, Shapiro, Robert, Haeggstroem, Jesper Z., Vallee, Bert L., and Samuelsson, Bengt. 1991. leukotriene a4 hydrolase: determination of the three zinc-binding ligands by site-directed mutagenesis and zinc analysis. *Proc. Natl. Acad. Sci. U. S. A.* 88(17): 7620-4 .
- FL** Medvid, V. S. content and changes of copper, zinc, and cobalt in the blood of guinea pigs infected with epidermophytosis. *Sb. Nauch. Tr. L'Vov. Nauch. Obshch. Dermatovenerol.* (1967) 5: 68-73 From: Ref. Zh., Biol. Khim. 1968, Abstr. No. 12F996.
- HHE** Meftah, S. P., Prasad, A. S., DuMouchelle, E., Zafrallah, T., and Rabbani, P. 1984. testicular androgen binding protein in zinc deficient rats (and humans). *Nutrition Research.* 4 (3): 437-446.
- Nut def** Meftah, Sheila P., Prasad, Ananda S., DuMouchelle, Elizabeth, Cossack, Zafrallah T., and Rabbani, Parviz. testicular androgen binding protein in zinc deficient rats. *Nutr. Res. (N. Y.)* (1984) 4(3): 437-46.
- No COC** Megarrity, R. G. and Jones, R. J. 1983. toxicity of leucaena leucocephala in ruminants: the effect of supplemental thyroxine on goats fed on a sole diet of leucaena. *Australian Journal of Agricultural Research* 34(6): 791-798.
- FL** Megdiatov, R. S., Vorobeichik, I. a. M., Dolgikh, V. G., and Reshetniak, V. K. 1995. [the role of zinc ions in the pathogenesis of trigeminal neuralgia (experimental and clinical research)]. <original> rol' ionov tsinka v patogeneze trigeminal'noi nevralgii (eksperimental'no-klinicheskoe issledovanie). *Zhurnal Nevropatologii i Psikiatrii Imeni S.S. Korsakova* 95(5): 14-8.
- HHE** Mehennaoui, S., Charles, E., Joseph-Enriquez, B., Clauw, M., and Milhaud, G. E. 1988. indicators of lead, zinc and cadmium exposure in cattle. ii. controlled feeding and recovery. *Veterinary and Human Toxicology* 30(6): 550-555.
- Meth** Mehra, R. K. and Bremner, I. 1983. development of a radioimmunoassay for rat liver metallothionein-i and its application to the analysis of rat plasma and kidneys. *Biochemical Journal* 213(2): 459-65.
- No Oral** Mehra, Rajesh K. and Bremner, Ian. influence of zinc on the synthesis of copper-metallothionein in the livers of rats given high-copper diets. *Biochem. Soc. Trans.* (1983) 11(6): 775-6.
- Unrel** Mehta, J. R., Braund, K. G., and Toivio-Kinnucan, M. 1990. elemental composition, water, and total lipid content in peripheral nerves, spinal cord and brain of healthy adult dogs. *Research in Veterinary Science* 49(2): 250-2.
- Nut def** Mehta, S. and Mehta, U. 1988. the effect of low, optimum and higher dietary zinc copper levels on hemoglobin levels in rats. *Indian Journal of Nutrition and Dietetics* 25(12): 384-387.
- No Tox** Mehta, S. N. and Gangwar, P. C. certain responses in erythrocyte potassium zinc iron and copper in lactating buffaloes with seasonal changes in thermal environment. *International Journal of Biometeorology.* 28 (2). 1984. 109-113.
- No COC** Mehta, S. W. and Eikum, R. effects of estrogen on serum and tissue levels of copper and zinc. *Advances In Experimental Medicine And Biology.* 1989. v. 258 p. 155-162.

- Abstract** Mehta, T. and Poetter, C. effect of psyllium husk on small intestine morphology and bio availability of zinc and copper in rats. *68TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 1-6, 1984 FED PROC.* 43 (4). 1984. Abstract 4480.
- Nut def** Mehta, U. and Kawatra, B. L. effect of feeding zinc deficient and supplemented bengalgram (cicer arietinum) diets on the urinary excretion of total nitrogen, uric acid, creatinine and urea in rats. *Nutr. Rep. Int.* (1984) 29(1): 217-21.
- Nut def** Mehta, U. and Kwatra, B. L. 1987. effect of feeding zinc-deficient and zinc-supplemented bengalgram dietson nitrogen and zinc absorption in rats. *Journal of Research, Punjab Agricultural University* 24(3): 517-522.
- FL** Meiramov, G. G. and Trukhanov, N. I. 1975. [the ultrastructure of pancreatic beta cells in dithizone diabetes and its prevention by sodium diethyldithiocarbamate]. <original> ul'trastruktura pankreatincheskikh beta-kletok pri ditizonovom diabete i ego preduprezhdenie dietilditiokarbamatom natriia. *Problemy Endokrinologii* 21(6): 92-5.
- FL** Meiramov, G. G. and Trukhanov, N. I. ultrastructure of the pancreatic beta cells in dithizone diabetes and its prevention with sodium di ethyl di thio carbamate. *Problemy Endokrinologii.* 21 (6). 1975 (Recd 1976) 92-95.
- FL** Meissner, D. and Eichhorn, D. 1978. behavior of serum copper and serum zinc during shock in experimental animal studies and patients. *Zentralbl. Pharm. Pharmakother. Laboratoriumsdiagn.* 117(7): 788-91.
- Fate** Mejborn, H. 1987. the effect of interactions between dietary protein and zinc content onprotein-zinc utilization in young male mink. *Scientifur* 11(3): 233-237.
- Bio Acc** Mejborn, H. 1990. endogenous zinc excretion in relation to various levels of dietary zinc intake in the mink (mustela vison). *J.Nutr.* 120: 862-868.
- FL** Mejborn, H. 1989. zinc balances in young and adult mink (mustela-vison) vison) in relation to dietary zinc intake. *Journal Of Animal Physiology And Animal Nutrition-Zeitschrift Fur Tierphysiologie Tierernahrung Und Futtermittelkunde* 61(4): 187-192.
- FL** Mejborn, H. National Inst. of Animal Science Foulum Tjele Denmark Research in Fur Animals. 1989. zinc balances in young and adult mink (mustela vison) in relation to dietary zinc intake. *Journal of Animal Physiology and Animal Nutrition.* V. 61(4) P. 187-192
- No Oral** Mejborn, Heddie. endogenous zinc excretion in relation to various levels of dietary zinc intake in the mink (mustela vison). *J. Nutr.* (1990) 120(8): 862-8.
- FL** Mejborn, Heddie. zinc balances in young and adult mink (mustela vison) in relation to dietary zinc intake. *J. Anim. Physiol. Anim. Nutr.* (1989) 61(4): 187-92.
- FL** Mejean, L., Mbugha, K. K., Klein, D., and Debry, G. 1979. effect of relative level of zinc and copper in dietary-intake on circulatory lipids in rats. *Annales De La Nutrition Et De L Alimentation* 33: 520.
- FL** Mekinova D(A), Chorvathova, V., Volkovova, K., Staruchova, M., Grancicova, E., Klvanova, J., and Ondreicka, R. 1995. effect of intake of exogenous vitamins c, e and beta-carotene on the antioxidative status in kidneys of rats with streptozotocin-induced diabetes. *Nahrung* 39(4): 257-261.

- FL** MEL'NIKOVA, V. V. and SAL'NIKOVA, L. S. evaluation of the mutagenic effect of zinc chloride. *GIG TR PROF ZABOL; 0* (3). 1989. 58.
- Mix** Meldrum, J. B., Troutt, H. F., Kornegay, E. T., Ehrich, M. F., Chickering, W. R., and <Editors> Tumbleson, M. E. 1986. influence of selenium, zinc and restricted floor space on glutathione peroxidase and creatine phosphokinase activities and on production performance in weanling pigs. <document title>swine in biomedical research. volume 2. 1069-1076.
- Phys** Meli, C., Sisti, R., Cicalese, R., Rossiello, E., Subissi, A., and Mariani, M. F. lack of foetotoxicity and teratogenicity following administration of idrapril calcium, a novel angiotensin-converting enzyme inhibitor, to the rat and the rabbit. *Teratology* 1996 May;53(5):33A
- Bact** Melin, L., Holmgren, N., Wallgren, P., and Franklin, A. 1997. sensitivity to olaquinox and zinc of coliform bacteria from weanedpigs. *Svensk Veterinartidning* 49(13): 573-579.
- No Dose** Mellanby, K. 1971. sea pollution. *Chem. and Ind. (London)* ; 40): 1120-1122
- CP** Mello, C. V., Vicario, D. S., and Clayton, D. F. 1992. song presentation induces gene expression in the songbird forebrain. *Proceedings of the National Academy of Sciences of the United States of*
- FL** Mello, W. de, Holland, R., and Souza, V. de. 1972. [pulp capping with calcium hydroxide or zinc oxide eugenol paste. comparative histological study in dogs]. <original> capeamento pulpar com hidroxido de calcio ou pasta de oxido de zinco e eugenol. estudo histologico comparativo em dentes de caes. *Revista Da Faculdade De Odontologia De Aracatuba* 1(1): 33-44.
- FL** Meluzzi, A., Franchini, A., Giordani, G., and Bertuzzi, S. 1986 . induction of moult in laying hens. 1. effects of fasting and of zincoxide. *Zootecnica e Nutrizione Animale* 12(6): 465-472.
- FL** Meluzzi, A., Franchini, A., Giordani, G. Bologna Univ. Italy Istituto di Zooculture, and Bertuzzi, S. 1986. [molting induction in laying hens. 1. effects of fasting and of zinc oxide]. <original> induzione della muta nelle galline ovaiole. 1: effetto del digiuno e dell'ossido di zinco. *Zootecnica e Nutrizione Animale*. V. 12(4) P. 465-472
- In Vit** Mena Maria A, Khan Uzma, Togasaki Daniel M, Sulzer David, Epstein Chacles J, and Przedborski Serge(A). 1997. effects of wild-type and mutated copper/zinc superoxide dismutase on neuronal survival and l-dopa-induced toxicity in postnatal midbrain culture. *Journal of Neurochemistry* 69(1): 21-33.
- Phys** Menard, M. P. and Cousins, R. J. 1983. effect of citrate, glutathione and picolinate on zinc transport by brush-border membrane-vesicles from rat intestine. *Journal Of Nutrition* 113(8): 1653-1656.
- Nut def** Menard, M. P., McCormick, C. C., and Cousins, R. J. 1981. regulation of intestinal metallothionein biosynthesis in rats by dietary zinc. *The Journal Of Nutrition*. 111 (8): 1353-1361.
- CP** Menard, M. P., McCormick, C. C., and Cousins, R. J. 1980. regulation of metallothionein biosynthesis in intestine and liver by dietary zinc. *Federation Proceedings* 39(3, I): 434 .
- CP** Menard, M. P., Oestreicher, P., and Cousins, R. J. 1983. zinc transport by isolated, vascularly perfused rat intestine and intestinal brush-border vesicles. *Acs Symposium Series* 210: 233-246.
- In Vit** Menard, Michael P. and Cousins, Robert J. zinc transport by brush border membrane vesicles

from rat intestine. *J. Nutr.* (1983) 113(7): 1434-42 .

- Acu** Menard, Michael P., McCormick, Charles C., and Cousins, Robert J. regulation of intestinal metallothionein biosynthesis in rats by dietary zinc. *J. Nutr.* (1981) 111(8): 1353-61 .
- Unrel** Mench, J. A., van Tienhoven, A., Marsh, J. A., McCormick, C. C., Cunningham, D. L. , and Baker, R. C. 1986. effects of cage and floor pen management on behavior, production, and physiological stress responses of laying hens. *Poultry Science* 65(6): 1058-69.
- CP** Mench, J. A., Van Tienhoven A, Marsh, J. A., McCormick, C. C., Cunningham, D. L., and Baker, R. C. welfare of laying hens housed in pens and cages. *73RD ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC. POULT SCI.* 63 (Suppl. 1). 1984. 149.
- OAC** Menczel, J., Lender, M., and Spencer, H. 1981. effect of starvation on super(65)zn tissue distribution and excretion by rats. *IN "TRACE SUBSTANCES IN ENVIRON. HEALTH-XV* : pp. 113-120.
- CP** Mendez E, G. and Huerta Bravo, M. Universidad Autonoma Chapingo Mexico. 1989. [the mineral status of dairy cattle in quintana roo state, mexico]. <original> estado mineral de bovinos lecheros en quintana roo, mexico. [22. ordinary meeting of the mexican association of animal production (summaries)]. <original> 22. reunion ordinaria de la asociacion mexicana de produccion animal (resumenes). P. 42
- Alt** Meneely, R. and Ghishan, F. K. 1982. in vivo intestinal zinc transport in rats: normal and growth retarded. *Journal of Pediatric Gastroenterology and Nutrition* 1(1): 119-24.
- In Vit** Meneely, R. L. and Ghishan, F. K. 1980. intestinal maturation - zinc transport in normal and growth retarded rats. *Clinical Research* 28: A821.
- Nut def** Meneely, Raymond and Ghishan, Faye K. in vivo intestinal zinc transport in rats : normal and growth retarded. *J. Pediatr. Gastroenterol. Nutr.* (1982) 1(1): 119-24.
- FL** Mengert, U., Fehlhaber, K., and Arwana, A. A. 1998. investigating stress-induced endogenous microbial contamination of muscovy ducks in connection with feeding zinc-bacitracin. *Archiv Fur Geflugelkunde* 62(2): 49-54.
- Nut def** Mengheri, E., Bises, G., and Gaetani, S. 1985. cell mediated immune response in rats fed diets with increasing amount of phytate. *Nutrition Reports International* 32(6): 1435-1445.
- Nut def** Mengheri, E., Bises, G., and Gaetani, S. differentiated cell-mediated immune response in zinc deficiency and in protein malnutrition. *Nutr. Res. (N. Y.)* (1988) 8(7): 801-12.
- Nut def** Mengheri, E., Vignolini, F., and Gaetani, S. zinc deficiency affects the expression of il-2 but not of il-2r in spleen lymphocytes of rats . *Nutr. Res. (N. Y.)* (1995) 15(4): 505-15
- Nut def** Mengheri, Elena, Nobili, Fabio, Vignolini, Francesco, Pesenti, Michela, Brandi, Giovanni, and Biavati, Bruno. bifidobacterium animalis protects intestine from damage induced by zinc deficiency in rats. *J. Nutr.* (1999) 129(12): 2251-2257.
- CP** Menissier De Murcia Josiane(A), Niedergang Claude, Trucco Carlotta, Ricoul Michele, Dutrillaux Bernard, Mark Manuel, Oliver, F. Javier, Masson Murielle, Dierich Andree, Lemeur Marianne, Walztinger Caroline, Chambon Pierre, and De Murcia Gilbert. 1997. requirement of poly(adp-ribose) polymerase in recovery from dna damage in mice and in cells. *Proceedings of the National Academy of Sciences of the United States of America* 94(14): 7303-7307.

- CP** Menke, K. H., Lantzsch, H. J., and Schenkel, H. 1978. a new method for estimation of zinc and copper status by chelating agents. *Trace Elem. Metab. Man Anim. Proc. Int. Symp.*, 3rd : Meeting Date 1977, 456-9. Editor(s): Kirchgessner, M. Publisher: Arbeitskreis Tierernaehrungsforschung Weihenstephan Inst. Ernaehrungsphysiol., Freising-Weihenstephan, Ger..
- FL** Menzi, H., Lehmann, E., and Kessler, J. 1999. amount and composition of manure produced by fattening beef cattle. *Agrarforschung* 6(11-12): 417-420.
- Nut def** Mercalli, M. E., Seri, S., Aquilio, E., Cramarossa, L., Del Gobbo, V., Accinni, L., and Toniette, G. zinc deficiency and thymus ultrastructure in rats . *Nutrition Research*. July/Aug 1984. v. 4 (4) p. 665-671. ill.
- CP** Mercer, J. F. B. 1983. metallothionein genes and their involvement in zinc and copper-metabolism. *Proceedings Of The Australian Biochemical Society* 15: S10.
- In Vit** Mercer, Julian F. B. and Grimes, Andrew. variation in the amounts of hepatic copper, zinc and metallothionein mrna during development in the rat. *Biochem. J.* (1986) 238(1): 23-7 .
- Nut def** Mercer, Julian F. B., Stevenson, Trevor, Wake, Samantha A., Mitropoulos, Georgia, Camakaris, James, and Danks, David M. developmental variation in copper, zinc and metallothionein mrna in brindled mutant and nutritionally copper deficient mice. *Biochim. Biophys. Acta* (1991) 1097(3): 205-11.
- Model** Mercer, L. Preston, Dodds, Steven J., and Gustafson, Jon M. the determination of nutritional requirements: a modeling approach. *Nutr. Rep. Int.* (1986) 34(3): 337-50 .
- Phys** Meredith, M., Marques, D. M., O'Connell, R. O., and Stern, F. L. 1980. vomeronasal pump: significance for male hamster sexual behavior. *Science* 207(4436): 1224-6.
- No Oral** Meredith, M. and O'connell, R. J. 1988. hrp uptake by olfactory and vomeronasal receptor neurons use as an indicator of incomplete lesions and relevance for non-volatile chemoreception. *Chemical Senses*. 13(4): 487-516.
- Nut def** Merker, H. J. and Gunther, T. testis damage induced by zinc deficiency in rats. *J. Trace Elem. Med. Biol.* (1997) 11(1): 19-22.
- No Oral** Merker H-J(A), Vormann, J., and Guenther, T. 1996. iron-induced injury of rat testis. *Andrologia* 28(5): 267-273.
- FL** Merkur'eva, R. V., Krasovskii, G. N., Koganova, Z. I., Shaternikova, I. S., Varshavskaya, S. P., Konstantinova, I. N., Bushinskaya, L. I., Protsenko, E. I., and Shchedrina, L. A. biochemical studies of the activity of lysosomal and cytosol enzymes in tissues and biological fluids of rats ingesting zinc in drinking water. *Gig. Sanit.* (1979) (10): 17-20.
- FL** Merkur'eva, R. V., Krasovskii, G. N., Koganova, Z. I., Shaternikova, S., Varshavskaya, S. P., Konstantinova, I. N., Bushinskaya, L. I., Protsenko, E. I., and Shchedrina, L. A. 1979. (biochemical investigation of the activity of lysosome and cytosol enzymes in tissues and biological fluids with peroral introduction of zinc). *GIGIENA I SANITARIYA* No. 10: 17-20.
- FL** Merkur'eva, R. V., Krasovskii, G. N., Koganova, Z. I., Shaternikova, S., Varshavskaya, S. P., Konstantinova, I. N., Bushinskaya, L. I., Protsenko, E. I., and Shchedrina, L. A. 1979. biochemical study of the activity of lysosomal and cytosol enzymes in tissues and biological fluids of rats given zinc by mouth. *Gigiena i Sanitariya* (10): 17-20.

- No Dose** Merriam, George R., Nunnelley, Lewis L., Trish, James W. V., and Naftolin, Frederick. sex-related and cyclic variation of trace elements in rat hypothalamus and pituitary. *Brain Res.* (1979) 171(3): 503-10 .
- Diss** Merrill, J. C. 1987. investigations into the mechanism of action of the toxic sesquiterpenelactones, helenalin and hymenoxon. *Dissertation Abstracts International, B (Sciences and Engineering)* 48(6): 1615.
- Mix** MERRINGTON, G., WINDER, L., and GREEN, I. the uptake of cadmium and zinc by the bird-cherry oat aphid rhopalosiphum padi (homoptera: aphididae) feeding on wheat grown on sewage sludge amended agricultural soil. *ENVIRONMENTAL POLLUTION*; 96 (1). 1997. 111-114.
- Org Met** Merson, M. H. and Byers, R. E. laboratory efficacy of some commercial zinc phosphide baits used for control of meadow and pine voles in orchards. *HortScience* (1981) 16(1): 49-51 .
- Org Met** Merson, M. H. and Byers, R. E. laboratory efficacy of some commercial zinc phosphide baits used for control of meadow voles microtus-pennsylvanicus and pine voles microtus-pinetorum in orchards. *Hortscience*. 16 (1). 1981. 49-51.
- Org Met** Merson, M. H. and Byers, R. E. 1985. weathering and the field efficacy of pelletized rodenticide baits in orchards. *Crop Protection* 4(4): 511-519.
- No COC** Merson, M. H. and Byers R. E. 1985. weathering and the field efficacy of pelletized rodenticide baits in orchards. *Crop Prot.* 4(4): 511-519.
- FL** Mertin, D., Suevegova, K., Oravcova, E. Vyskumny Ustav Zivocisnej Vyroby Nitra Slovak Republic, and Sviatko, P. 1994. concentrations of some mineral elements in the mink body in the period of fur maturity. <original> koncentracia niektorých minerálnych prvkov v tele noriek v období kozusínovej zrelosti. *Zivocisna Vyroba - UZPI.* V. 39(2) P. 121-127
- Gene** Mertsalov, I. B., Kulikova, D. A., Alimova Kost, M. V., Ninkina, N. N., Korochkin, L. I., and Buchman, V. L. 2000. structure and expression of two members of the d4 gene family in mouse. *Vol. 11, No. 1, Pp. 72-74 Mammalian Genome*
- Bio Acc** Meskin, M. S., Smith, C. H., and Bidlack, W. R. 1986. zinc levels in blood liver and spleen are unaffected by high dietary-intake of ascorbic-acid or iron in female guinea-pigs. *Journal Of Nutrition* 116: R42.
- Unrel** Mesquita, C. H. 1991. *Modelo Para Determinacao Da Absorcao De Substancias Radioativas: Aplicacao Em Radiodosimetria e Nutricao. (Model for Absorption Determination of Radioactive Materials: Application in the Radio Dosimetry and Nutrition Study).* INIS-BR-2929
- Abstract** MESROBIAN, A. the influence of dietary zinc supplements on experimental oral malignancies. *J DENT RES*; 55 (SPEC ISSUE B). 1976 B66
- Drug** Mesrobian, A. Z. and Shklar, G. the effect of dietary zinc sulfate supplements on the healing of experimental extraction wounds. *ORAL SURG ORAL MED ORAL PATHOL. Oral Surgery Oral Medicine Oral Pathology.* 28 (2). 1969 259-265.
- CP** Mesrobian, Armen Z. 1972. effect of dietary zinc supplements on experimental jaw fracture healing. *Trace Subst. Environ. Health - 5 Proc. Univ. Mo. Annu. Conf., 5th : Meeting Date* 1971, 205-14. Editor(s): Hemphill, Delbert D. Publisher: Univ. Mo.-Columbia, Columbia, Mo..
- Surv** Messer, N. T. 1981. tibiotarsal effusion associated with chronic zinc intoxication in three horses. *Journal of the American Veterinary Medical Association* 178(3): 294-297.

- FL** Mestek, O., Deyl, Z., Miksik, I., Novotna, J., Pfeifer, I., and Herget, J. 1998. accumulation of lead in tissues after its administration in drinking water to laboratory rats. *Physiol. Res. (Prague)* 47(3): 197-202 .
- Acu** Methfessel, A. H. and Spencer, H. 1973. zinc metabolism in the rat. 1. intestinal absorption of zinc. *Journal of Applied Physiology* 34(1): 58-62.
- No Oral** Methfessel, A. H. and Spencer, H. 1973. zinc metabolism in the rat. 2. secretion of zinc into intestine. *Journal of Applied Physiology* 34(1): 63-67.
- No Oral** Meurs, K. M., Breitschwerdt, E. B., and Baty, C. J. 1991. postsurgical mortality secondary to zinc toxicity in dogs. *Veterinary And Human Toxicology.* 33(6): 579-583.
- Nut def** Meydani, S. N. and Dupont, J. 1982. effect of zinc deficiency on prostaglandin synthesis in different organs of the rat. *Journal of Nutrition* 112(6): 1098-104.
- Nut def** Meydani, S. N. JONUA, Meydani, M., and Dupont, J. 1983. effects of prostaglandin modifiers and zinc deficiency on possibly related functions in rats. *The Journal Of Nutrition.* 113 (3): 494-500.
- Nut def** Meydani, Simin N. and Dupont, Jacqueline. effect of zinc deficiency on prostaglandin synthesis in different organs of the rat. *J. Nutr. (1982)* 112(6): 1098-104
- Nut def** Meydani, Simin Nikbin, Meydani, Mohsen, and Dupont, Jacqueline. effects of prostaglandin modifiers and zinc deficiency on possibly related functions in rats. *J. Nutr. (1983)* 113(3): 494-500.
- Nut def** Meyer, H. 1987. feeding of pedigree dogs. *Effem-Forschung Fur Kleintiernahrung Report* (25): 1-14.
- Dead** Meyer, H., Hebel, D., and Tiegs, W. 1997. zinc concentrations in the liver of fetuses and newborn foals. *Pferdeheilkunde* 13(3): 237-244.
- Nut def** Meyer, H., Hommerich, G., Schoon, H.-A., and Mundt, C. 1986. experimental zinc deficiency in adult dogs. *Kleintierpraxis* 31(1): 21-22, 27-28.
- FL** Meyer, H. Tieraerztliche Hochschule Hannover Germany Inst. fuer Tierernaehrung, Tiegs, W., Stuck, S., Anke, M., Meissner, D., Bergmann, H., Bitsch, R., Dorn, W., Flachowsky, G., Groppel, B., Guertler, H., Lombeck, I., Luckas, B., Merbach, W., and Schneider, H. J. 1994. copper and zinc concentrations in the liver of aborted and new-born foals. <original> kupfer- und zink-konzentrationen in der leber von abortierten und neugeborenen fohlen. (deficits and surpluses on macro and trace elements in the nutrition). <original> defizite und ueberschuesse an mengen- und spurenelementen in der ernaehrung. *P.* 348-353
- Nut def** Meyer, J. and Alvares, O. F. 1974. dry weight and size of cells in the buccal epithelium of zinc-deficient rats: a quantitative study. *Archives of Oral Biology* 19(6): 471-6.
- Nut def** Meyer, J., Stohle, M. R., and Stablein, M. J. 1981. correlation of changes in capillary supply and epithelial in the hyperplastic buccal mucosa of zinc-deficient rats. *Journal of Oral Pathology* 10(1): 49-59.
- Nut** Meyer, N. R., Stuart, M. A., and Weaver, C. M. 1983. bioavailability of zinc from defatted soy flour, soy hulls and whole eggs as determined by intrinsic and extrinsic labeling techniques. *Journal of Nutrition* 113(6): 1255-64.

- Nut** Meyer, Nancy R., Stuart, Mary A., and Weaver, Connie M. bioavailability of zinc from defatted soy flour, soy hulls and whole eggs as determined by intrinsic and extrinsic labeling techniques. *J. Nutr.* (1983) 113(6): 1255-64 .
- No COC** Mican, P. and Bouska, J. 1972. influence of chlortetracycline, zn-bacitracin and flavomycin on the caecal microflora of broilers. *Biologizace a Chemizace Vyzivy Zvirat* 8(1): 23-29.
- FL** Mican, P., Bouska, J., and Kukla, J. 1973. first results with mecadox for fattening pigs. *Biologizace a Chemizace Vyzivy Zvirat* 9(3): 273-281.
- Nut def** Miceli, M. V., Tate, D. J. Jr, Alcock, N. W., and Newsome, D. A. 1999. zinc deficiency and oxidative stress in the retina of pigmented rats. *Investigative Ophthalmology & Visual Science* 40(6): 1238-44.
- FL** Michael, B., Zink, F., and Lantzsche, H. J. effect of phosphate application on phytin phosphorus and other phosphate fractions in developing wheat triticum-aestivum grains. *Zeitschrift Fuer Pflanzenernaehrung Und Bodenkunde*. 143 (4). 1980. 369-376.
- Abstract** MICHAEL, W. R. and WAKIM, J. M. calcium and zinc metabolism in the presence of trisodium nitrilotriacetate. *TOXICOL APPL PHARMACOL*; 22 (2). 1972 297
- No COC** Michael, William R. and Wakim, Jubran M. effect of trisodium nitrilotriacetate (na₃nta) on the metabolism of selected metal ions. *Toxicol. Appl. Pharmacol.* (1973) 24(4): 519-29.
- CP** Michel, A. D. and Humphrey, P. P. A. 1994. the effect of metal cations on (3h)alpha,beta-methylene atp binding to rat vas deferens membranes. *British Journal of Pharmacology* 112(PROC. SUPPL. MAY): 136P.
- In Vit** Michel, A. D(A) and Humphrey, P. P. A. 1994. effects of metal cations on (3h)alpha,beta-methylene atp binding in rat vas deferens. *Naunyn-Schmiedeberg's Archives of Pharmacology* 350(2): 113-122.
- Unrel** Michel, B., Stephan, D., Grima, M., Barthelmebs, M., and Imbs, J. L. 1993. effects of one-hour and one-week treatment with ramipril on plasma and renal brush border angiotensin converting enzyme in the rat. *European Journal of Pharmacology* 242(3): 237-43.
- Org Met** Michie, M. W., Angerhofer, R. A., Barlow, M. P., and Beall, P. A. 1988. *Effects of Ingestion of Zinc Naphthenate on the Reproduction Function of Rats. Phase 5.* <NOTE> Study Rept. Jan 87-Feb 88. USAEHA-75-51-0497-91
- In Vit** Micklem, K. J., Alder, G. M., Buckley, C. D., Murphy, J., and Pasternak, C. A. 1988. protection against complement-mediated cell damage by ca²⁺ and zn²⁺. *Complement* 5(3): 141-52 .
- In Vit** Mieden, G. D., Keen, C. L., Hurley, L. S., and Klein, N. W. 1986. effects of whole rat embryos cultured on serum from zinc-deficient and copper-deficient rats. *Journal Of Nutrition* 116(12): 2424-2431.
- In Vit** Mieden, Gregory D., Keen, Carl L., Hurley, Lucille S., and Klein, Norman W. effects of whole rat embryos cultured on serum from zinc- and copper-deficient rats. *J. Nutr.* (1986) 116(12): 2424-31.
- Drug** Miert, A. S. J. P. A. M. van, Duin, C. T. M. van, Verheijden, J. H. M., and Schotman, A. J. H. 1982. endotoxin-induced fever and associated haematological and blood biochemical changes in the goat: the effect of repeated administration and the influence of flurbiprofen. *Research in Veterinary Science* 33(2): 248-255.

- CP** Mihova, Z. 1995. zinc in low does prevents pneumocystis carinii pneumonia in a rat model. *European Respiratory Journal* 8(SUPPL. 19): 406S.
- No COC** Mikami, M., Kitahara, M., Kitano, M., Ariki, Y., Mimaki, Y., Sashida, Y., Yamazaki, M., and Yui, S. 1999. suppressive activity of lycoricidinol (narciclasine) against cytotoxicity of neutrophil-derived calprotectin, and its suppressive effect on rat adjuvant arthritis model. *Biological & Pharmaceutical Bulletin* 22(7): 674-8.
- Unrel** Mikawa, S., Kinouchi, H., Kamii, H., Gobbel, G. T., Chen, S. F., Carlson, E., Epstein, C. J., and Chan, P. H. 1996. attenuation of acute and chronic damage following traumatic brain injury in copper, zinc-superoxide dismutase transgenic mice. *Journal of Neurosurgery* 85(5): 885-91.
- Surv** Mikkelsen, R. L., Page, A. L., and Bingham, F. T. geochemistry and health in california: recent experiences with selenium. *Trace Subst. Environ. Health* (1986) : 20, 413-23 .
- CP** Mikoshiba Katsuhiko(A). 1998. molecular mechanism of the development and formation of the brain. *Neuroscience Research Supplement* (22): S13.
- No Dose** Miksik I(A), Holan, V., and Deyl, Z. 1996. avian eggshell pigments and their variability. *Comparative Biochemistry and Physiology B* 113(3): 607-612.
- FL** Milachowski, K., Moschinski, D., and Stawinoga, B. the influence of the trace elements copper and zinc on bone healing in rabbits. *Unfallheilkunde*. 84 (4). 1981. 168-174.
- Alt** Milanino, R., Cassini, A., Conforti, A., Franco, L., Marrella, M., Moretti, U., and Velo, G. P. copper and zinc status during acute inflammation: studies on blood, liver and kidney metal levels in normal and inflamed rats. *Agents Actions* (1986) 19(3-4): 215-23.
- No Dose** Milanino, R., Marrella, M., Moretti, U., Concari, E., and Velo, G. P. 1988. copper and zinc status in rats with acute-inflammation - focus on the inflamed area. *Agents And Actions* 24(3-4): 356-364.
- No Oral** Milanino, R., Moretti, U., Concari, E., Marrella, M., and Velo, G. P. 1988. copper and zinc status in adjuvant-arthritic rat: studies on blood, liver, kidneys, spleen and inflamed paws. *Agents and Actions* 24(3-4): 365-76.
- CP** Milbrandt, J. nerve growth factor induces transcription of genes encoding zinc-finger proteins. *SYMPOSIUM ON MOLECULAR NEUROBIOLOGY HELD AT THE 19TH ANNUAL UCLA (UNIVERSITY OF CALIFORNIA-LOS ANGELES) SYMPOSIA ON MOLECULAR AND CELLULAR BIOLOGY, SOUTH PADRE ISLAND, TEXAS, USA, APRIL 17-23, 1990. J CELL BIOCHEM SUPPL.* 0 (14 Part F). 1990. 50.
- Nut** Milgate, J. and Roberts, D. C. K. 1995. the nutritional & biological significance of saponins. *Nutrition Research* 15(8): 1223-1249.
- HHE** Milhaud, G. E. and Mehennaoui, S. 1988. indicators of lead, zinc and cadmium exposure in cattle: i. results ina polluted area. *Veterinary and Human Toxicology* 30(6): 513-517.
- Alt** Milin, Cedomila, Radosevic-Stasic, Biserka, Verbanac, Donatella, Domitrovic, Robert, Petkovic, Marija, Trobonjaca, Zlatko, Ravlic-Gulan, Jagoda, Cuk, Mira, Varljen, Jadranka, and Rukavina, Daniel. 1995. activation of zinc-dependent hepato-thymic axis during liver regeneration in hepatectomized mice. *Croat. Chem. Acta* 68(3): 559-67 .
- No COC** MILLER, C. R., ZHU, S. Y., VICTERY, W., and GOYER, R. A. 1986. partitioning of renal zinc between metallothionein and edta after treatment of rats with calcium disodium edta. *TOXICOL*

APPL PHARMACOL; 84 (3): 584-592.

- Plant** Miller, D. M., Wells, B. R., and Norman, R. J. fertilization of rice on graded soils using organic materials. *ARKANSAS AGRIC EXP STN RES SER. Arkansas Agricultural Experiment Station Research Series. 0 (411). 1991. 55-58.*
- Nut def** Miller, D. W., Vetter, R. J., Hullinger, R. L., and Shaw, S. M. 1975. the uptake and distribution of cadmium-115m in calcium deficient and zinc deficient golden hamsters. *Bulletin of Environmental Contamination and Toxicology* 13(1): 40-43.
- Unrel** Miller, E. R., <Editors> Miller, E. R., Ullrey, D. E., and Lewis, A. J. 1991. iron, copper, zinc, manganese, and iodine in swine nutrition. <Document Title> *Swine Nutrition* : 267-284.
- Rev** Miller, E. R., Lei, X., and Ullrey, D. E. 1991. trace elements in animal nutrition. 593-662.
- Mix** Miller, J. and Landes, D. R. 1975. hematological response of rats to diets containing either marginal or adequate levels of methionine, iron, and zinc. *Nutrition Reports International* 11(2): 103-112.
- Meth** Miller, J. K. 1972. new techniques for intensive research with dairy cattle--mineral research. *Journal of Dairy Science* 55(8): 1211-9.
- Nut** Miller, J. K., Madsen, F. C., Holwerda, R. A., and Campbell, M. H. 1996. zinc may protect periparturient dairy cattle against excessive dietary iron. *Feedstuffs* 68(20): 12-14 .
- Sludge** Miller, Josephine and Boswell, Fred C. 1981. cadmium, lead and zinc in growing rats fed corn leaf tissue grown on soil amended with sewage sludge or heavy metal salts. *Environ. Health Perspect.* 42: 197-202 .
- Nut def** Miller, Josephine and Landes, Doelas R. hematological response of rats to diets containing either marginal or adequate levels of methionine, iron, and zinc. *Nutr. Rep. Int. (1975)* 11(2): 103-12 .
- Unrel** Miller, K. J., Michel, A. D., Chessell, I. P., and Humphrey, P. P. A. cibacron blue allosterically modulates the rat p2x4 receptor. *Neuropharmacology (1998)* 37(12): 1579-1586
- No COC** Miller, L. L., Schalch, D. S., and Draznin, B. 1981. role of the liver in regulating somatomedin activity: effects of streptozotocin diabetes and starvation on the synthesis and release of insulin-like growth factor and its carrier protein by the isolated perfused rat liver. *Endocrinology* 108(4): 1265-1271.
- Unrel** Miller, Sheldon I., Del Villano, Bert C., Flynn, Arthur, and Krumhansl, Margaret. 1983. interaction of alcohol and zinc in fetal dysmorphogenesis. *Pharmacol. Biochem. Behav.* 18 (Suppl. 1): 311-15.
- CP** Miller, W. J. homeostatic control of zinc in ruminants. *AMERICAN DAIRY SCIENCE ASSOCIATION. PROCEEDINGS: SECOND WORLD CONFERENCE ON ANIMAL PRODUCTION. XIX + 537P. ILLUS. MAP. AMERICAN DAIRY SCIENCE ASSOCIATION: URBANA, ILL., U.S.A. 1969. 444.*
- Rev** Miller, W. J. 1981. mineral and vitamin nutrition of dairy cattle. *Journal of Dairy Science* 64(6): 1196-1206.
- CP** Miller, W. J., Kincaid, R. L., Neathery, M. W., Gentry, R. P., Ansari, M. S., and Lassiter, J. W. 1978. zinc metabolism in calves, cows, rats and chicks fed high dietary zinc. *Trace Elem.*

Metab. Man Anim. Proc. Int. Symp., 3rd, Meeting Date 1977, 175-8. Editor(s): Kirchgessner, M. Publisher: Arbeitskreis Tierernaehrungsforschung Weihenstephan Inst. Ernaehrungsphysiol., Freising-Weihenstephan, Ger..

- Abstract** Miller, W. J., Martin, Y. G., and Blackmon, D. M. influence of varying protein and energy intake on wound healing hair growth hair and serum zinc enz serum alkaline phosphatase packed cell volume and hemo globin in the bovine abstract. *Federation Proceedings.* 28 (2). 1969 491
- Drug** Miller, W. J., Martin, Y. G., Blackmon, D. M., and Fowler, P. R. effects of high protein diets with normal and low energy intake on wound healing hair growth hair and serum zinc and serum alkaline phosphatase in dairy heifers. *Journal of Nutrition.* 98 (4). 1969 411-419.
- CP** Miller, W. J., Neathery, M. W., Gentry, R. P., Blackmon, D. M., and Stake, P. E. adaptations in zinc metabolism by lactating cows fed a low zinc practical type diet. *HOEKSTRA, W. G. ET AL. (ED.). TRACE ELEMENT METABOLISM IN ANIMALS, NO. 2. PROCEEDINGS OF THE SECOND INTERNATIONAL SYMPOSIUM. MADISON, WIS., U.S.A., JUNE 18-22, 1973. XXVI+775P. ILLUS. UNIVERSITY PARK PRESS: BALTIMORE, MD., U.S.A.; LONDON, ENGLAND. ISBN 0-8391-0696-3. 1974 550-552*
- Abstract** Miller, W. J., Wells, E. S., Gentry, R. P., Neathery, M. W., Blackmon, D. M., and Lassiter, J. W. effects of high dietary zinc levels on zinc metabolism after a single intra venous zinc-65 dose. *Federation Proceedings.* 30 (2). 1971 644
- Nut def** Mills, B. J., Lindeman, R. D., and Lang, C. A. 1981. effect of zinc deficiency on blood glutathione levels (rats). *The Journal Of Nutrition.* 111 (6): 1098-1102.
- Nut def** Mills, Betty J., Lindeman, Robert D., and Lang, Calvin A. effect of zinc deficiency on blood glutathione levels. *J. Nutr. (1981)* 111(6): 1098-102.
- CP** Mills, C. F. 1980. metabolic interactions of copper with other trace elements. *Ciba Foundation Symposium* 79: 49-69.
- Abstract** Mills, C. F., Quarterman, J., Chesters, J. K., Williams, R. B., and Dalgarno, A. C. 1969. metabolic role of zinc. *American Journal of Clinical Nutrition* 22(9): 1240-9.
- In Vit** Mills, J. W., Church, G., and Lacroix, J. 1994. interaction between ca, cd, and zn and the actin filaments in mdck cells. *In Vitro Cellular & Developmental Biology Animal* 30A(3 PART 2): 89.
- Gene** Mills, W., Critcher, R., Lee, C., and Farr, C. J. 1999. generation of an approximately 2.4 mb human x centromere-based minichromosome by targeted telomere-associated chromosome fragmentation in dt40. *Human Molecular Genetics* 8(5): 751-61.
- Nut def** Milne, D. B., Ralston, N. V. C., and Wallwork, J. C. 1985. zinc content of blood cellular components and lymph node and spleen lymphocytes in severely zinc-deficient rats. *The Journal Of Nutrition.* 115(8): 1073-1078.
- No COC** Milthorpe, B. K., Nichol, L. W., and Jeffrey, P. D. sedimentation analysis of the polymerization behavior of zinc insulin at physiological ph. *Proceedings of the Australian Biochemical Society.* 10. 1977 10
- Surv** Milton, Adrian and Johnson, Michael. 1999. biomonitoring of contaminated mine tailings through age accumulation of trace metals in the bank vole (*clethrionomys glareolus*). *J. Environ. Monit.* 1(3): 219-225.

- Alt** Mimouni, V. and Poisson, J. P. 1992. altered desaturase activities and fatty acid composition in liver microsomes of spontaneously diabetic wistar bb rat. *Biochimica Et Biophysica Acta* 1123(3): 296-302.
- Abstract** Min, S. H(A), Farr, V. C(A), Lee J(A), Cooper, G. J. S., and Davis, S. R(A). 1998. effects of amylin on mineral metabolism in lactating goats. *Journal of Dairy Science* 81(SUPPL. 1): 234.
- Meth** Minami, T., Matsubara, H., O-Higashi, M., Kubo, K., Okabe, N., and Okazaki, Y. 1996. analysis of interaction between cadmium and metallothionein isoforms by capillary zone electrophoresis. *Electrophoresis* 17(10): 1602-6.
- Nut def** Minami, Takeshi, Fushimi, Hisako, Inoue, Toru, Yamada, Yuya, and Okazaki, Yuko. diabetic osteoporosis and renal dysfunctions are enhanced by zinc deficiency. *Recent Res. Dev. Nutr. Res. (1998)* : 2, 121-129.
- Alt** Minami, Takeshi, Ichii, Masayo, Okazaki, Yuko, Kubo, Michinori, Kadota, Eizi, Inoue, Toru, Yamada, Yuya, and Fushimi, Hisako. renal changes of streptozotocin-induced diabetic rats fed a low-zinc diet. *Renal Failure (1995)* Volume Date 1995, 17(4): 349-63.
- Alt** Minami, Takeshi, Okazaki, Yuko, Komiya, Hisanao, Horiuchi, Yoshitaka, Inoue, Toru, Yamada, Yuya, and Fushimi, Hisako. accumulation of hydroxyapatite in the kidney of streptozotocin-induced diabetic rat fed a low-zinc diet. *Biol. Trace Elem. Res. (1995)* 49(1): 67-74.
- Drug** Minami, Takeshi, Sasaki, Hiroto, Okazaki, Yuko, Inoue, Toru, Yamada, Yuya, and Fushimi, Hisako. effects of insulin and 1.alpha.-hydroxy vitamin d3 on streptozotocin- induced diabetic rats fed a low zinc diet. *Biol. Pharm. Bull. (1993)* 16(5): 468-70.
- FL** Minato, A. and Ogiso, T. 1966. [studies on metalloprotein. ix. the effects of excessive dietary zinc on serum copper and oxidase activity of ceruloplasmin]. *Yakugaku Zasshi* 86(6): 521-4.
- FL** Minetti, C. A. S. A., Oshiro, M. M., Santos, M. F., Romaldini, J. H., Moura, N. M., Valle, L. B. S., and Oliveira-Filho, R. M. 1992. androgenic expression in the submandibular gland of zinc-deficient mice. *Annals Of Nutrition And Metabolism*. 36(3): 167-174.
- FL** Minetti, Conceicao A. S. A., Oshiro, Mario M., Santos, Marilice F., Romaldini, Joao H., Moura, Neidmar M., Valle, Luiz B. S., and Oliveira-Filho, Ricardo M. androgenic expression in the submandibular gland of zinc-deficient mice. *Ann. Nutr. Metab. (1992)* 36(3): 167-74
- In Vit** Minkel, D. T., Poulsen, K., Wielgus, S., Shaw, C. F. 3d, and Petering, D. H. 1980. on the sensitivity of metallothioneins to oxidation during isolation. *Biochemical Journal* 191(2): 475-85.
- Nut def** Minkus, Tracy M., Koski, Kristine G., and Scott, Marilyn E. marginal zinc deficiency has no effect on primary or challenge infections in mice with heligmosomoides polygyrus (nematoda). *J. Nutr. (1992)* 122(3): 570-9.
- Carcin** Mints, S. M., Padalka, E. S., and Lazarovich, V. G. iron, copper, zinc, and cobalt content of organs and tissues of rats during tumor growth. *Mikroelem. Med. (1973)* : 4, 25-30 .
- Abstract** Mintzer, C., Carlomagno, M. A., Black, S. H., and McMurray, D. N. effect of dietary protein and zinc deficiencies on anti mycobacterial antibody responses in bcg vaccinated guinea-pigs. *84TH ANNUAL MEETING OF THE AMERICAN SOCIETY FOR MICROBIOLOGY, ST. LOUIS, MO., USA, MAR. 4-9, 1984. ABSTR ANNU MEET AM SOC MICROBIOL. 84 (0). 1984. Abstract U7.*
- Nut def** Mintzer, Carole L., Carlomagno, Mirta A., and McMurray, David N. effect of dietary protein

and zinc on anti-mycobacterial antibody responses in guinea pigs. *Nutr. Res. (N. Y.)* (1986) 6(2): 167-79 .

- No Oral** Miro, J. L., Canguilhem, B., and Schmitt, P. 1980. effects of bulbectomy on hibernation, food intake and body weight in the european hamster, *cricetus cricetus*. *Physiology and Behavior* 24(5): 859-862.
- In Vit** MISHIMA, A., KAJI, T., YAMAMOTO, C., SAKAMOTO, M., and KOZUKA, H. zinc-induced tolerance to cadmium cytotoxicity without metallothionein induction in cultured bovine aortic endothelial cells. *TOXICOLOGY LETTERS (SHANNON)*; 75 (1-3). 1995. 85-92.
- Nut def** Mishima Kazuaki(A), Amemiya Tsugio, and Takano Kunio. 1999. x-ray microanalysis of melanin granules of retinal pigment epithelium and choroid in hereditary copper deficient mice (macular mice). *Experimental Eye Research* 68(1): 59-65.
- No COC** Mishra, U. K., Dwarkanath, P. K., and Hossain, M. I. clinical manifestation and hepatic trace minerals in growing chickens as influenced by t-2 toxin. *Indian J. Anim. Sci.* (1987) 57(10): 1069-74.
- Phys** Misra, U., Shukla, S., Gurtu, S., Saxena, A. K., and Shanker, K. 1995. novel pyrimidinediones and thiazolidinones as anti depressants. *Bollettino Chimico Farmaceutico* 134(9): 492-6.
- Ecol** Mitchell, C. J. winter survival of *culex-tarsalis* diptera culicidae hibernating in mine tunnels in boulder county colorado usa *Journal of Medical Entomology*. 16 (6). 1979 (Recd. 1980). 482-487.
- Abstract** MITCHELL, C. L., BARNES, M. I., and GRIMES, L. 1988. diethyldithiocarbamate and dithizone augment the toxicity of kainic acid. *18TH ANNUAL MEETING OF THE SOCIETY FOR NEUROSCIENCE*
- No COC** Mitchell, Clifford L. and Barnes, Martha I. proconvulsant action of diethyldithiocarbamate in stimulation of the perforant path. *Neurotoxicol. Teratol.* (1993) 15(3): 165-71.
- No COC** Mitchell, G. Vaughan and Jenkins, M. Young. effect of excess l-lysine on rat growth and on plasma and tissue concentrations of copper, iron and zinc. *J. Nutr. Sci. Vitaminol.* (1983) 29(6): 709-15.
- No Oral** Mitchell, M. A. and Carlisle, A. J. 1991. plasma zinc as an index of vitellogenin production and reproductive status in the domestic fowl. *Comparative Biochemistry And Physiology : A : Comparative Physiology*. 100(3): 719-724.
- FL** Mitin, V., Gradinski-Vrbanac, B., Mazija, H., Kis, I., and Pisl, Z. 1996. concentration of glutathione and tbars in chickens fed on varying amounts of mineral or chelated zinc. *Krmiva* 38(3): 141-148.
- Drug** Mitrovic, M., Schildknecht, E. G., and Marusich, W. L. 1975. comparative anti coccidial activity and compatibility of lasalocid in broiler chickens. *Poultry Science*. 54 (3): 757-761.
- No Oral** Mittal, M., Chandra, S., and Chandra, S. 1995. comparative tissue toxicity evaluation of four endodontic sealers. *Journal of Endodontics* 21(12): 622-4.
- No COC** Mittal, V. P. and Vyas H. J. 1992. groundnut. *Rodents in Indian Agriculture*. 1: 249-264.
- No COC** Miura, Tsutomu, Uehara, Mariko, Suzuki, Kazuharu, Kanke, Yusuke, and Goto, Shiro. 1998. long-term effect of high dietary calcium level on fecal mineral excretion in rats. *Nippon Eiyo Shokuryo Gakkaishi* 51(2): 81-86.

- OAC** Miyachi, Y. 1996. head-up behavior induced by low-doses of x-irradiation in the mouse and its disappearance by zinc sulfate perfusion in the nasal passage. *Behav. Processes* 36(3): 297-301.
- Unrel** Miyachi, Y. and Yamada, T. 1996. head-portion exposure to low-level x-rays reduces isolation-induced aggression of mouse, and involvement of the olfactory carnosine in modulation of the radiation effects. *Behavioural Brain Research* 81(1-2): 135-40.
- No Oral** Miyake Naoki, Sawada Mitsutaka, and Hiai Hiroshi(A). 1995. regeneration of paneth cells after dithizone treatment. *Acta Histochemica Et Cytochemica* 28(6): 549-553.
- BioX** Miyamoto, O., Minami, J., Toyoshima, T., Nakamura, T., Masada, T., Nagao, S., Negi, T., Itano, T., and Okabe, A. 1998. neurotoxicity of clostridium perfringens epsilon-toxin for the rat hippocampus via the glutamatergic system. *Infection and Immunity* 66(6): 2501-8.
- FL** Miyazawa, E. on the chronic toxicity of two year- administration of zinc salt of polyoxin d in rats (detailed report). *Nippon Daigaku Igaku Zasshi (Nippon Univ. Med. J.)* 38(5): 947-996 1979 (10 References)
- Unrel** Mizoguchi Hirokazu, Suzuki Tsutomu(A), and Misawa Miwa. 1993. effects of serotonergic anxiolytics on physical dependence on diazepam in mice. *Neuroscience Letters* 160(1): 41-44.
- Nut def** Mizoguchi, T. and Amemiya, T. ultrastructural study of corneal epithelium in zinc-deficient rat. *Folia Ophthalmologica Japonica*. 41 (3). 1990. 494-498.
- Nut def** Mizoguchi, T. and Amemiya, T. ultrastructure of the corneal epithelium of zinc deficient rats deficiency and recovery. *Trace Elements in Medicine*. 9 (2). 1992. 84-89.
- No Oral** Mizuno, Toshio, Hikami, Yuzo, and Nakanishi, Mitsuo. effects of chloride supplements on formation of urinary calculi in rats. *Kobe Daigaku Nogakubu Kenkyu Hokoku (1971)* 9(1,2): 151-5 .
- No Dose** Mizuno, Y. 1984. superoxide dismutase activity in early stages of development in normal and dystrophic chickens. *Life Sciences* 34(10): 909-14.
- FL** Mkhitarian, V. G. BZARA and Gevorkian, D. M. 1981. <translated> influence of vitamin e, superoxide dismutase and zinc ions on the process of lipid peroxidation in rats with alloxan diabetes. *Biologicheskii Zhurnal Armenii*. v. 34 (8): 783-788.
- No Oral** Mkhitarian, V. G. and Gevorkyan, D. M. effect of vitamin e super oxide dis mutase and zinc ions on the process of lipid per oxidation in alloxan diabetes in rats. *Biologicheskii Zhurnal Armenii*. 34 (8). 1981. 783-788.
- FL** Mo, B. and Ma, F. a study on the bioavailability of zinc enokitake. *ACTA NUTR SIN*. 12 (4). 1990. 378-382.
- Nut def** Mo, Baoqing and Ma, Fenglou. bioavailability of zinc of enokitake. *Yingyang Xuebao (1990)* 12(4): 378-82.
- Nut def** Mobarhan, Sohrab, Layden, Thomas J., Friedman, Howard, Kunigk, Annette, and Donahue, Philip. depletion of liver and esophageal epithelium vitamin a after chronic moderate ethanol consumption in rats : inverse relation to zinc nutriture. *Hepatology (Baltimore)* (1986) 6(4): 615-21 .
- Unrel** Mobarhan, Sohrab, Russell, Robert M., Newberne, Paul M., and Ahmed, Saffia B. the effect of

- zinc deficiency and alcohol feeding on esophageal epithelium of rats. *Nutr. Rep. Int.* (1984) 29(3): 639-45.
- Nut def** Mobarhan, Sohrad, Greenberg, Bruce, Mehta, Rajendra, Friedman, Howard, and Barch, David. zinc deficiency reduces hepatic cellular retinol-binding protein in rats. *Int. J. Vitam. Nutr. Res.* (1992) 62(2): 148-54.
- IMM** Mocchegiani, E., Corradi, A., Santarelli, L., Tibaldi, A., DeAngelis, E., Borghetti, P., Bonomi, A., Fabris, N., and Cabassi, E. 1998. zinc, thymic endocrine activity and mitogen responsiveness (pha) in piglets exposed to maternal aflatoxicosis b1 and g1. *Veterinary Immunology and Immunopathology* 62(3): 245-260.
- CP** Mocchegiani, E., Muzzioli, M., and Fabris, N. 1991. effect of dietary zinc supplementation on immune function in aging mice. *Trace Elem. Man Anim. 7: Monogr. Proc., Round Tables Discuss. Int. Symp., 7th* : Meeting Date 1990, 31-8-31/9. Editor(s): Momcilovic, Berislav. Publisher: Inst. Med. Res. Occup. Health Univ. Zagreb, Zagreb, Yugoslavia.
- IMM** Mocchegiani, E., Muzzioli, M., Santarelli, L., and Fabris, N. 1992. restoring effect of oral supplementation of zinc and arginine on thymic endocrine activity and peripheral immune functions in aged mice. *Arch. Gerontol. Geriatr. Suppl.* 3(Congr. IABG: Free Pap., 4th, 1991), 267-75 .
- Alt** Mocchegiani, E., Verbanac, D., Santarelli, L., Tibaldi, A., Muzzioli, M., Radosevic-Stasic, B., and Milin, C. 1997. zinc and metallothioneins on cellular immune effectiveness during liver regeneration in young and old mice. *Life Sciences* 61(12): 1125-45.
- Nut** Mocchegiani, Eugenio, Santarelli, Lory, Muzzioli, Mario, and Fabris, Nicola. reversibility of the thymic involution and of age-related peripheral immune dysfunctions by zinc supplementation in old mice. *Int. J. Immunopharmacol.* (1995) 17(9): 703-18 .
- Nut** Mochida, Hiromi, Kikuchi, Takeo, Tanaka, Hyoutaro, Ikeda, Akira, Fujii, Yuji, and Sato, Makoto. nutritional effects of mmb-1, 2 and 3, new tpm solutions, in rats. *Yakuri to Chiryō* (1991) 19(2): 443-55.
- FL** Moersch, J. 1973. (experiments in reproducing necrotic enteritis in broiler chickens). *Nordisk Veterinarmedicin* 25(No.6): 300-307.
- Nut** Moersen, Thomas J. and Borgman, Robert F. relation of dietary carbohydrates to lipid metabolism and the status of zinc and chromium in rabbits. *Am. J. Vet. Res.* (1984) 45(6): 1238-41 .
- Nut def** Moffat, J. F., Edelstein, P. H., Regula, D. P. Jr., Cirillo, J. D., and Tompkins, L. S. 1994. effects of an isogenic zn-metalloprotease-deficient mutant of legionella pneumophila in a guinea-pig pneumonia model. *Vol. 12, No. 5, Pp.* 693-705 *Mol. Microbiol.*
- In Vit** Moffatt, P., Plaa, G. L., and Denizeau, F. 1996. rat hepatocytes with elevated metallothionein expression are resistant to n-methyl-n'-nitro-n-nitrosoguanidine cytotoxicity. *Toxicology and Applied Pharmacology* 136(1): 200-7.
- In Vit** Moffatt, Pierre, Lachapelle, Mario, Plaa, Gabriel L., and Denizeau, Francine. induction and localization of metallothionein in isolated rat hepatocytes exposed to zinc and epidermal growth factor. *Met. Ions Biol. Med. Proc. Int. Symp., 3rd* (1994): 577-82. Editor(s): Collery, Philippe. Publisher: Libbey, Montrouge, Fr.
- Unrel** Mogha, I. V., Hoque, M., and Kumar, Ram. experimental studies on the role of zinc sulfate on

gastric wound healing in rabbits. *Indian J. Anim. Sci.* (1993) 63(6): 633-5

- No Oral** Mogilnicka, Ewa M. and Webb, M. 1982. the effects of cadmium and copper on the renal uptake and metallothionein binding of gold in the rat and hamster. *Chem.-Biol. Interact.* 40(2): 247-56 .
- CP** Mohamed, O., Edrise, B., Mohamed, F., and Ismail, T. 1997. the immune-potentiating impact of vitamin e and zinc in buffalo calves. *Journal of Animal Science* 75(SUPPL. 1): 266.
- Nut def** Mohamed, O. E., Hady, M. M., and Zaki, M. M. 1990. role of dietary zinc on immune response of broiler chickens. *Veterinary Medical Journal Giza* 38(2): 283-295.
- Abstract** Mohamed, O. E., Mohamed, F. F., Telab, H. M., and Abdellatif, H. A. 1995. influence of dietary supplementation of vitamin e and/or zinc on electrophoretic pattern and immunity in buffalo calves. *Journal of Animal Science* 73(SUPPL. 1): 281.
- Diss** Mohammad Azzar Ali. 1992. production performance and physiological response of old layer quails (coturnix coturnix japonica temminck and schlegel) given forced molting treatments. 80 *Leaves*
- Not Avail** Mohammed, K. A. Minia Univ. Egypt Faculty of Agriculture. 1992. forced molting induced by fasting or high zinc supplemented diet and its effect on the subsequent performance of rir [rhode island red] hens. *Minia Journal of Agricultural Research and Development.* V. 14(3) P. 963-978
- No Control** Mohanna, C., Carre, B., and Nys, Y. incidence of dietary viscosity on growth performance and zinc and manganese bioavailability in broilers. *Anim. Feed Sci. Technol.* (1999) 77(3-4): 255-266.
- BioAcc** Mohanna, C. and Nys, Y. 1998. influence of age, sex and cross on body concentrations of trace elements (zinc, iron, copper and manganese) in chickens. *British Poultry Science* 39(4): 536-43.
- CP** Mohd Hair Bejo, Abdul Razak Alimon, Maria, J., Hass, M. Y., Moonafizad, M. Pertanian Malaysia Univ. Serdang Selangor Malaysia Faculty of Veterinary Medicine and Animal Science, Sharif, H., Liang, J. B., Ariff, O. M., and Saadiah, J. eds. 1995. dietary zinc supplementation: an alternative treatment for palm kernel cake toxicity in sheep [malaysia]. towards corporatising the animal and feed industries: proceedings of the 17th malaysian society of animal production (msap) annual conference. P. 116-117
- Plant** Moilanen Mikko(A), Penttila Timo, and Issakainen Jorma. 1996. effects of fertilization on tree growth and nutrient status of norway spruce stands on drained peatlands in northern finland. *Suo (Helsinki)* 47(3): 85-94.
- Alt** Molkentin, J. D., Lin, Qing, Duncan, S. A., and Olson, E. N. 1997. requirement of the transcription factor gata4 for heart tube formation and ventral morphogenesis. *Vol. 11, No. 8, Pp. 1061-1072* Genes Dev.
- CP** Momcilovic, B. 1982. copper-64 metabolism in infant rats fed milk enriched with zinc, iron and copper. *Trace Elem. Metab. Man Anim. Proc. Int. Symp., 4th* : Meeting Date 1981, 578-80. Editor(s): Gawthorne, J. M.; Howell, J. McC.; White, C. L. Publisher: Springer, Berlin, Fed. Rep. Ger.
- CP** Momcilovic, B. 1997. dose-rate idiorhythm is a powerful tool for the detection of subtle mineral interactions. a case for the expression of recommended dietary allowances (rdas) and safety limits (rfd) in the range format. *Trace Elem. Man Anim.--9 Proc. Int. Symp., 9th* : Meeting

Date 1996, 403-405. Editor(s): Fischer, Peter W. F. Publisher: National Research Council of Canada, Ottawa, Ont..

- CP** Momcilovic, B. 1978. the effect of milk enriched with zinc, iron and copper on zinc-65 retention in newborn rats. *Trace Elem. Metab. Man Anim. Proc. Int. Symp.*, 3rd : Meeting Date 1977, 448. Editor(s): Kirchgessner, M. Publisher: Arbeitskreis Tierernaehrungsforschung Weihenstephan Inst. Ernaehrungsphysiol., Freising-Weihenstephan, Ger..
- Nut** Momcilovic, B. experimental design for the study of dietary interactions in infant rat nutrition. *Periodicum Biologorum*. 81 (3). 1979 (Recd. 1980). 559-566.
- CP** Momcilovic, B. 1982. iron-59 metabolism in infant rats fed milk enriched with zinc, iron, and copper. *Trace Elem. Metab. Man Anim. Proc. Int. Symp.*, 4th : Meeting Date 1981, 581-3. Editor(s): Gawthorne, J. M.; Howell, J. McC.; White, C. L. Publisher: Springer, Berlin, Fed. Rep. Ger..
- CP** Momcilovic, B. 1994. the study of dietary zinc dose/rate (d/r) impact on growth of weanling rats with an idiorrhythmic experimental feeding design. *FASEB Journal* 8(4-5): A937 .
- Nut def** Momcilovic, B., Belonje, B., Giroux, A., and Shah, B. G. bio availability of zinc in milk and soy protein based infant formulas. *Journal of Nutrition*. 106 (7). 1976 913-917.
- Nut def** Momcilovic, B., Belonje, B., Giroux, A., and Shah, B. G. total femur zinc as the parameter of choice for a zinc bioassay in rats. *Nutr. Rep. Int.* (1975) 12(3): 197-203 .
- Abstract** Momcilovic, B., Belonje, B., and Shah, B. G. the choice of young rat tissue for a zinc bioassay. *FED PROC. Federation Proceedings*. 34 (3). 1975 906
- Nut def** Momcilovic, B., Belonje, B., and Shah, B. G. 1975. suitability of young rat tissue for a zinc bioassay. *Nutrition Reports International* 11(5): 445-452.
- QAC** Momcilovic, B., Blake, M. J., Buckley, A. R., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. restrained stress-induced heat shock protein (hsp70) expression in aortas and adrenal glands of moderately zinc-deficient rats. 141-144 .
- Mix** Momcilovic, B. and Kello, D. 1977. the effect of milk enriched with iron on 65zn absorption. *Nutrition Reports International* 15(6): 651-657.
- Nut** Momcilovic, B. and Kello, D. 1979. fortification of milk with zinc and iron. *Nutritional Reports International* 20(3): 429-436.
- Nut def** Momcilovic, B. and Shah, B. G. femur zinc, magnesium, and calcium in rats fed tower rapeseed (brassica napus) protein concentrate. *Nutr. Rep. Int.* (1976) 13(2): 135-42 .
- Bio Acc** Momcilovic, B. and Shah, B. G. 1976. femur zinc, magnesium, and calcium in rats fed tower rapeseed(napus) protein concentrate. *Nutrition Reports International* 13(2): 135-142.
- Nut def** Momcilovic, B., Shah, B. G., Belonje, B., and Giroux, A. 1976. bio availability of zinc in infant foods. *Nutrition Reports International*. 14(6): 717-724.
- CP** Momcilovic B(A), Blake, M. J., and Reeves, P. G. 1995. aortal heat shock protein-70 mrna (hsp70mrna) and intestinal metallothionein (imt) response in weanling rats fed graded amounts of dietary zinc. *FASEB Journal* 9(4): A738.
- Nut def** Momcilovic, Berislav. coupling of zinc dose to frequency in a regularly recurrent pattern shows a

- limited capacity of excessive dietary zinc to compensate for a previously deficient intake. *J. Nutr.* (1995) 125(10): 2687-99.
- FL** Momcilovic, Berislav. fortification of milk with physiological concentrations of zinc and iron. *Mljekarstvo* (1980) 30(1): 3-6 .
- Unrel** Momcilovic, Berislav and Reeves, Philip G. quantitative assessment of the effects of variability in dietary zinc dose-rate idiorhythms upon zinc deposition in bone of weanling rats by using a slope-ratio assay. *J. Nutr. Biochem.* (1997) 8(5): 256-264.
- No Dose** Momcilovic, Berislav, Reeves, Philip G., and Blake, Michael J. idiorhythmic dose-rate variability in dietary zinc intake generates a different response pattern of zinc metabolism than conventional dose-response feeding. *Br. J. Nutr.* (1997) 78(1): 173-191.
- Nut def** Momcilovic, B., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993 . idiorhythmic vs continuous zinc dietary intake - a model approach to the study of trace element dose/rate impact. 194-197.
- Diss** Monkiewicz, J. 1988. analysis of the influence of the legnica-glogow copper district on the organism and production of cows. <original> analiza skutkow oddziaływania legnicko-glogowskiego okregu miedziowego na organizm i uzytkowosc krow. 74 P. No. 73
- Abstract** Montgomery, R. L. and Leonard, D. L. zinc concentrations in brains of brain lesioned rats. *Journal of the Elisha Mitchell Scientific Society.* 88 (4). 1972 (Recd 1973) 184
- Alt** Mooradian, A. D., Morley, J. E., and Scarpance, P. J. 1988. the role of zinc status in altered cardiac adenylate cyclase activity in diabetic rats. *Acta Endocrinologica* 119(2): 174-80.
- Alt** Mooradian, A. D., Norman, D. C., and Morley, J. E. the effect of zinc status on the immune function of diabetic rats. *Diabetologia* (1988) 31(9): 703-7
- Alt** Mooradian, Arshag D., Morley, John E., and Scarpance, Philip J. the role of zinc status in altered cardiac adenylate cyclase activity in diabetic rats . *Acta Endocrinol.* (1988) 119(2): 174-80.
- Unrel** Moore, C. L., Dou, H., and Juraska, J. M. 1992. maternal stimulation affects the number of motor neurons in a sexually dimorphic nucleus of the lumbar spinal cord. *Brain Research* 572(1-2): 52-6.
- No Oral** Moore, C. L. and Power, K. L. 1992. variation in maternal care and individual differences in play, exploration, and grooming of juvenile norway rat offspring. *Developmental Psychobiology* 25(3): 165-82.
- Mix** Moore, C. L., Walker, P. M., Winter, J. R., Jones, M. A., and Webb, J. W. zinc methionine supplementation for dairy cows. *Transactions of the Illinois State Academy of Science.* 82 (3-4). 1989. 99-108.
- CP** Moore, J. B., Blanchard, R. K., and Cousins, R. 1999. identification of dietary zinc regulated expressed sequence tags in murine thymus by mrna differential display. *FASEB Journal* 13(4 PART 1): A241.
- Nut** Moore, R. J. and Kornegay, E. T. 1984-1985. influence of duration of feeding of high fiber diets on mineral balance of growing pigs. *Animal Science Research Report, Virginia Agricultural Experiment Station* (4): 82-86.
- Abstract** Moore, R. J., Lindemann, M. D., and Kornegay, E. T. effect of dietary oat hulls or wheat bran on

mineral absorption in growing pigs fed diets with and without salinomycin. *62ND ANNUAL MEETING OF THE VIRGINIA ACADEMY OF SCIENCE, RICHMOND, VA., USA, MAY 15-18, 1984. VA J SCI.* 35 (2). 1984. 66.

- Bio Acc** Mora, M. A. 1996. organochlorines and trace elements in four colonial waterbird species nesting in the lower laguna madre, texas. *Arch.Environ Contam Toxicol.* 31(4): 533-537.
- CP** Morais, M., Feste, A., Miller, R., and Lifschitz, C. 1995. effect of resistant and digestible starch on intestinal absorption of calcium, phosphorus, iron and zinc in infant pigs. *FASEB Journal* 9(4): A981.
- Nut def** Moran, J. R. and Lyerly, A. 1985. the effects of severe zinc deficiency on intestinal amino acid losses in the rat. *Life Sciences.* 36(26): 2515-2521.
- CP** Moran, J. R. and Lyerly, A. D. exacerbation of intestinal amino-acid loss by hypertonic solutions during in-vivo perfusion of zinc deficient rats. *COMBINED MEETING OF THE AMERICAN PEDIATRIC SOCIETY AND THE SOCIETY FOR PEDIATRIC RESEARCH, SAN FRANCISCO, CALIF., USA, MAY 1-4, 1984. PEDIATR RES.* 18 (4 Part 2). 1984. 206a.
- Nut def** Moran, J. Roberto and Lyerly, Anne. the effects of severe zinc deficiency on intestinal amino acid losses in the rat. *Life Sci. (1985)* 36(26): 2515-21.
- No COC** Moran, S. 1991. toxicity of sodium fluoroacetate and zinc phosphide wheat grain baits to microtus guentheri and meriones tristrami. *Bull.OEPP/EPPO.* 21(1): 73-80.
- Mix** Moreng, R. E., Balnave, D., and Zhang, D. 1992. dietary zinc methionine effect on eggshell quality on hens drinking saline water. *Poultry Science.* 71 (7): 1163-1167.
- Invert** Morgan, A. J., Sturzenbaum, S. R., Winters, C., Kille, P., <Editors> de Jong-Brink, M., Dohmen, M. R., and Golding, D. W. 1999. cellular and molecular aspects of metal sequestration and toxicity in earthworms. *Invertebrate Reproduction and Development* 36(1/3): 17-24.
- Surv** Morgan, Hilary and Simms, Dennis L. [cadmium contamination at shipham, england]. discussion and conclusions. *Sci. Total Environ. (1988)* 75(1): 135-43.
- No Dose** Morgan, K. L., Brown, P. J., Wright, A. I., Steele, F. C., and Baker, A. S. 1986. an investigation into the aetiology of 'wool slip': alopecia in ewes which are housed and shorn in winter. *Veterinary Record* 119(25/26): 621-625.
- CP** Morgan, P., Keen, C. L., and Lonnerdal, B. effect of altering dietary zinc intake during compensatory growth on tissue minerals relative organ weights and plasma protein. *FIFTH JOINT MEETING OF THE AMERICAN INSTITUTE OF NUTRITION, THE AMERICAN SOCIETY FOR CLINICAL NUTRITION, AND THE CANADIAN SOCIETY FOR NUTRITIONAL SCIENCES, DAVIS, CALIF., USA, JULY 20-24, 1986. AM J CLIN NUTR.* 43 (6). 1986. No Pagination.
- CP** Morgan, P., Keen, C. L., and Lonnerdal, B. 1985. effect of dietary zinc levels on tissue trace-elements and growth-response of mice during recovery from protein-energy malnutrition. *Federation Proceedings* 44: 1674.
- CP** Morgan, P., Keen, C. L., and Lonnerdal, B. 1986. effect of varying dietary zinc intake on body-composition and other parameters during recovery from protein-malnutrition in weanling mice. *Federation Proceedings* 45: 352.
- Abstract** Morgan, P. N., Cardinet, G. C. Jr, Keen, C. L., and Lonnerdal, B. effects of dietary zinc intake

during recovery from undernutrition on mouse gastrocnemius muscle gm. *71ST ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, WASHINGTON, D.C., USA, MARCH 29-APRIL 2, 1987. FED PROC.* 46 (3). 1987. 885.

- Nut def** Morgan, P. N., Keen, C. L., Calvert, C. C., and Lonnerdal, B. 1988. effect of varying dietary zinc intake of weanling mouse pups during recovery from early undernutrition on growth, body composition and composition of gain. *The Journal Of Nutrition.* 118(6): 690-698.
- CP** Morgan, P. N., Keen, C. L., Cardinet, G. H. III, and Lonnerdal, B. effects of varying dietary zinc in mice during recovery from undernutrition. *Trace Elements In Man And Animals 6 / Edited By Lucille S. Hurley, ... [Et Al.].* p. 611-612.
- Nut def** Morgan, P. N., Keen, C. L., and Lonnerdal, B. 1988. effect of varying dietary zinc intake of weanling mouse pups during recovery from early undernutrition on tissue mineral concentrations, relative organ weights, hematological variables and muscle composition. *The Journal Of Nutrition.* 118(6): 699-711.
- Nut def** Morgan, Paula N., Keen, Carl L., Calvert, C. Chris, and Lonnerdal, Bo. effect of varying dietary zinc intake of weanling mouse pups during recovery from early undernutrition on growth , body composition and composition of gain. *J. Nutr. (1988)* 118(6): 690-8 .
- Nut def** Morgan, Paula N., Wehr, Carol M., MacGregor, James T., Woodhouse, Leslie R., and King, Janet C. zinc deficiency, erythrocyte production, and chromosomal damage in pregnant rats and their fetuses. *J. Nutr. Biochem. (1995)* 6(5): 263-8.
- Diss** Morgan, Paula Nell. 1986. effects of varying dietary zinc intake of mouse pups during recovery from early undernutrition. *Avail.: Univ. Microfilms Int. Order No. DA8701702 From: Diss. Abstr. Int. B 1987, 47. 10. 4116. 254 pp.*
- Not Avail** Morgenstern, H. and Machtey, I. 1983. serum zinc and copper levels in rheumatoid-arthritis.
- BioX** Mori, N., Nikai, T., Sugihara, H., and Tu, A. T. 1987. biochemical characterization of hemorrhagic toxins with fibrinogenase activity isolated from crotalus ruber ruber venom. *Archives of Biochemistry and Biophysics* 253(1): 108-21.
- FL** Mori, N. and Nishimura, Y. biokinetic behavior of iron-59 zinc-65 and selenium-75 in liquid diet pair-fed rats effects of chronic ethanol administration. *Nichidai Igaku Zasshi.* 50 (1). 1991. 71-82.
- Mix** Mori, Naomiki, Hara, Motohiko, Takasu, Toshiaki, Nishimura, Yoshikazu, and Inaba, Jiro. biokinetic behavior of zinc-15 in liquid diet pair-fed rats . effects of chronic ethanol administration. *Biomed. Res. Trace Elem. (1991)* 2(2): 205-6 .
- No Oral** Morimoto, A., Murakami, N., Nakamori, T., Sakata, Y., and Watanabe, T. 1989. brain regions involved in the development of acute phase responses accompanying fever in rabbits. *Journal of Physiology* 416: 645-57.
- HHE** Morimoto, A., Murakami, N., Takada, M., Teshirogi, S., and Watanabe, T. 1987. fever and acute phase response induced in rabbits by human recombinant interferon-gamma. *Journal of Physiology* 391: 209-18.
- No Oral** Morimoto, A., Murakami, N., and Watanabe, T. is the central arachidonic acid cascade system involved in the development of acute-phase response in rabbits9. *Journal of Physiology (London).* 397 (0). 1988. 281-290.

- Alt** Morishima, Itsuro, Okumura, Kenji, Matsui, Hideo, Kaneko, Shinji, Numaguchi, Yasushi, Kawakami, Kei, Mokuno, Shinji, Hayakawa, Makoto, Toki, Yukio, Ito, Takayuki, and Hayakawa, Tetsuo. zinc accumulation in adriamycin-induced cardiomyopathy in rats : effects of melatonin, a cardioprotective antioxidant. *J. Pineal Res.* (1999) 26(4): 204-2.
- Gene** Morishita, K., Parker, D. S., Mucenski, M. L., Jenkins, N. A., Copeland, N. G., and Ihle, J. N. 1988. retroviral activation of a novel gene encoding a zinc finger protein in il-3-dependent myeloid-leukemia cell-lines. *Cell* 54(6): 831-840.
- Mineral** Morita, A., Kimura, M., and Itokawa, Y. changes with age in the mineral status in brain of female samp1 and samr1. *Int. Congr. Ser. - Excerpta Med.* (1994) 1062(SAM Model of Senescence): 317-20.
- Bio Acc** Morita, A., Kimura, M., and Itokawa, Y. effect of age and sex on trace elements in mice. *Biomed. Res. Trace Elem.* (1993) 4(2): 199-200 .
- Mineral** Morita, A., Kimura, M., and Itokawa, Y. 1994. the effect of aging on the mineral status of female mice. *Biological Trace Element Research* 42(2): 165-77.
- Mineral** Morita, Akemi, Kimura, Mieko, and Itokawa, Yoshinori. changes with age in the mineral status in brain of senescence accelerated mouse (sam). study of female mice. *Maguneshumu (Kyoto)* (1994) Volume Date 1993, 12(2): 137-43.
- Drug** Morita, T., Awakura, T., Shimada, A., Umemura, T., Nagai, T., and Haruna, A. 1995. vitamin d toxicosis in cats: natural outbreak and experimental study. *Journal of Veterinary Medical Science* 57(5): 831-7.
- FL** Morlacchini, M. Centro Ricerche per la Zootecnia e l'Ambiente CERZOO San Bonico Piacenza Italy, Amerio, M., and Piva, G. F. Universita Cattolica del Sacro Cuore Piacenza Italy Istituto di Scienze della Nutrizione. 1992. [feeding as a way to reduce the polluting action of swine excreta]. <original> l'alimentazione quale mezzo per ridurre l'azione inquinante delle deiezioni suine. *Informatore Agrario*. V. 48(Suppl.18) P. 7-10
- Nut def** Morley, John E., Gordon, Jody, and Hershman, Jerome M. zinc deficiency, chronic starvation, and hypothalamic-pituitary-thyroid function. *Am. J. Clin. Nutr.* (1980) 33(8): 1767-70.
- HHE** Morris, E. R. and Ellis, R. 1983. dietary phytate zinc molar ratio and zinc balance in humans. *Acs Symposium Series* 210: 159-172.
- Abstract** Morris, E. R. and Ellis, R. 1987. usefulness of the dietary phytic acid zinc molar ratio as an index of zinc bioavailability to rats and humans. *Abstracts Of Papers Of The American Chemical Society 1987, V194, Aug, P24-Agfd*
- CP** Morris, Eugene R. and Ellis, Rex. the biological availability to rats of iron and zinc in low-phytate wheat bran. *Agric. Rev. Man. West. Ser. U. S. Dep. Agric., Sci. Educ. Adm.)* (1978. Volume Date 1977, ARM-W-4 Proc. Natl. Conf. Wheat Util. Res., 10th, 51-62
- HHE** Morris, Eugene R. and Ellis, Rex. usefulness of the dietary phytic acid/zinc molar ratio as an index of zinc bioavailability to rats and humans. *Biol. Trace Elem. Res.* (1989) 19(1-2): 107-17.
- Unrel** Morrissey, E. E., Ip, H. S., Tang, Z., and Parmacek, M. S. 1997. gata-4 activates transcription via two novel domains that are conserved within the gata-4/5/6 subfamily. *Journal of Biological Chemistry* 272(13): 8515-24.

- Gene** Morrison, C. J., McMaster, W. R., and Piret, J. M. 1997. differential stability of proteolytically active and inactive recombinant metalloproteinase in chinese hamster ovary cells. *Vol. 53, No. 6, Pp. 594-600* Biotechnol. Bioeng.
- Nut def** Morrison, James N. and Bremner, Ian. effect of maternal zinc supply on blood and tissue metallothionein i concentrations in suckling rats. *J. Nutr. (1987) 117(9): 1588-94.*
- IMM** Morrow, W. J., Youinou, P., Isenberg, D. A., and Snaith, M. L. 1983. systemic lupus erythematosus: 25 years of treatment related to immunopathology. *Lancet 2(8343): 206-10.*
- No Oral** Morton, John D., Howell, Gailyn A., and Frederickson, Christopher J. effects of subcutaneous injections of zinc chloride on seizures induced by noise and by kainic acid. *Epilepsia (N. Y.) (1990) 31(2): 139-44.*
- CP** Morvan J(A), Brightwell J(A), Navarette K(A), Krause L(A), Flinn J(A), and Jones, B. 1999. the effect of different types of zinc-enriched water on spatial learning in rats. *Society for Neuroscience Abstracts. 25(1-2): 1829.*
- No Oral** Moser, Christian, Roth, Hans-Peter, and Kirchgessner, Manfred. influence of alimentary zinc deficiency on the concentration of the second messengers d-myo-inositol-1,4,5-trisphosphate (ip3) and s,n-1,2-diacylglycerol (dag) in testes and brain of force-fed rats. *Biol. Trace Elem. Res. (1996) 52(3): 281-291.*
- Nut** Moser, P. B. and Gunderson, C. J. 1983. changes in plasma zinc following the ingestion of a zinc multivitamin-mineral supplement with and without breakfast. *Nutrition Research 3(3): 279-284.*
- Phys** Mosquera, L., Forristall, C., Zhou, Y., and King, M. L. 1993. a mrna localized to the vegetal cortex of xenopus oocytes encodes a protein with a nanos-like zinc finger domain. *Development 117(1): 377-86.*
- Alt** Motoyama, J., Liu, J., Mo, Rong, Ding, Qi, Post, M., and Hui, Chi chung. 1998 . essential function of gli2 and gli3 in the formation of lung, trachea and oesophagus. *Vol. 20, No. 1, Pp. 54-57* Nat. Genet.
- Unrel** Mott, E. L., MacNeil, J. H., Mast, M. G., and Leach, R. M. protein efficiency ratio and amounts of selected nutrients in mechanically deboned spent layer meat. *Journal Of Food Science. Mar/Apr 1982. v. 47 (2) p. 655-656, 663. charts.*
- Nut** Motz, C., Roth, H.-P., and Kirchgessner, M. changes in zinc status and some side-effects on long-term diuretic therapy in growing rats. *Trace Elem. Electrolytes (1995) 12(2): 55-61 .*
- No COC** Moughan, P. J., Stevens, E. V. J., Reisima, I. D., and Rendel, J. 1989. the effect of avoparcin on the ileal and fecal digestibility of nitrogen and amino acids in the milk-fed calf. *Animal Production. 49(1): 63-72 .*
- Nut def** Moulder, K. and Steward, M. W. 1989. capillary-localized low-affinity antibody-antigen complexes act as a focus for the deposition of high-affinity complexes. *Clinical and Experimental Immunology 77(2): 275-80.*
- IMM** Moulder, K. and Steward, M. W. experimental zinc deficiency: effects on cellular responses and the affinity of humoral antibody. *Clin. Exp. Immunol. (1989) 77(2): 269-74*
- Fate** Moutafchiev Dimiter A and Sirakov Ljuben M(A). 1998. influence of ascorbic acid, sodium citrate, and sodium bicarbonate on the uptake of 59fe-transferrin, 54mn-transferrin, and 65zn-

transferrin from lactating mouse mammary gland cells. *Biological Trace Element Research* 63(1): 31-36.

- FL** Mozhaev, E. A. and Litvinov, N. N. joint action of detergents and other chemical substances on the body. *Gig. Sanit. (1972)* 37(4): 26-8.
- Plant** Mtimuni, J. P., Mfitilodze, M. W., and Mcdowell, L. R. interrelationships of minerals in soil-plant-animal system at kuti ranch malawi. *Communications in Soil Science and Plant Analysis*. 21 (5-6). 1990. 415-428.
- Carcin** Mu, Z. M., Chin, K. V., Liu, J. H., Lozano, G., and Chang, K. S. 1994. pml, a growth suppressor disrupted in acute promyelocytic leukemia. *Molecular and Cellular Biology* 14(10): 6858-67.
- No COC** Mucha, R. F. and Kalant, H. 1979. effect of desglycinamide(9)-lysine(8)-vasopressin and prolyl-leucyl-glycinamide on oral ethanol intake in the rat. *Pharmacology, Biochemistry, and Behavior* 10(2): 229-34.
- No COC** Mucha, R. F. and Kalant, H. effects of deglycinamide 9 lysine 8 vasopressin and prolylleucyl glycylglycinamide on oral ethanol intake in the rat. *Pharmacology Biochemistry and Behavior*. 10(2): 1979.
- FL** Muchowicz, M., Leroch, R., Solarz, J., and Fuchs, B. 1997. effect of different zinc oxide levels in mixtures for piglets on their productive parameters during (the) rearing period. *Biuletyn Naukowy Przemyslu Paszowego* 36(3/4): 57-68.
- FL** Mueller, D. and Brandt, G. zinc concentration of tissues in an experimental model of dystrophic disease related changes in liver and skeletal muscle and the influence of substitution of minerals in the recovery period. *Zeitschrift Fuer Ernaehrungswissenschaft*. 18 (4). 1979 (Recd. 1980). 286-294.
- FL** Mueller, D. and Brandt, G. zinc content of organs in experimental animal disease model: dystrophy dependent changes in liver and skeletal muscle and the effect of mineral substitution in the recovery phase. *Z. Ernaehrungswiss. (1979)* 18(4): 286-94
- Phys** Mueller, S. G., Paterson, A. J., and Kudlow, J. E. transforming growth factor alpha in arterioles cell surface processing of its precursor by elastases. *Molecular and Cellular Biology*. 10 (9). 1990. 4596-4602.
- Rev** Mueller, W. J. and Leach, R. M. Jr. 1974. effects of chemicals on egg shell formation. *Annu. Rev. Pharmacol.* 14: 289-303.
- No COC** Muhlbauer, R. C., Bonjour, J. P., and Fleisch, H. 1987. effects of glucagon on renal and extrarenal handling of inorganic phosphate in mice: evidence for inorganic phosphate mobilizing activity. *Mineral and Electrolyte Metabolism* 13(1): 45-50.
- In Vit** Muir David. 1994. metalloproteinase-dependent neurite outgrowth within a synthetic extracellular matrix is induced by nerve growth factor. *Experimental Cell Research* 210(2): 243-252.
- Unrel** Mujais Salim K. 1993. maleic acid-induced proximal tubulopathy: sodium, potassium pump inhibition. *Journal of the American Society of Nephrology* 4(2): 142-147.
- Mix** Mukherjee, Jagat J., Huang, Jin-Sheng, Getman, Crescent, and Kiss, Zoltan. bombesin promotes synergistic stimulation of dna synthesis by ethanol and insulin in fibroblasts. *Arch. Biochem. Biophys. (1999)* 362(1): 183-189.

- Org Met** Muktha Bai K, Krishnakumari, M. K., Ramesh, H. P., Shivanandappa, T., and Majumder, S. K. short-term toxicity study of zinc phosphide in albino rats *rattus-norvegicus*. *INDIAN J EXP BIOL. Indian Journal of Experimental Biology*. 18 (8). 1980. 854-857.
- No Dose** MULAY, S., PHILIP, A., and SOLOMON, S. influence of maternal diabetes on fetal rat development: alteration of insulin receptors in fetal liver and lung. *J ENDOCRINOL* 98:401-410,1983
- No COC** MULAY, S. and VARMA, D. R. influence of streptozotocin-diabetes on the pharmacokinetics, placental transfer and tissue localization of dexamethasone in rats. *BR J PHARMACOL* 83:139-144,1984
- IMM** Mulhern, S. A., Magruder, L. E., Jones, S. T., and Rabbani, P. I. 1982. excess dietary zinc causes hair loss and suppresses the immune-response in 2nd generation mice. *International Journal Of Immunopharmacology* 4: 323.
- FL** Mulhern, S. A., Stroube, W. B. Jr., and Jacobs, R. M. alopecia induced in young mice by exposure to excess dietary zinc. *Experientia* (1986) 42(5): 551-3
- CP** Mulhern, S. A., Vessey, A. R., Taylor, G. L., and Magruder, L. E. 1985. suppression of antibody response by excess dietary zinc exposure during certain stages of ontogeny. *Proceedings Of The Society For Experimental Biology And Medicine*. 180(3): 453-461.
- FL** Muller, D. and Brandt, G. 1979. contents of zinc in organs in an experimental animal model of disease:dystrophy-related changes in the liver and skeletal muscle and the effects of mineral substitution during recovery. *Zeitschrift Fur Ernährungswissenschaft* 18(4): 286-294.
- Herp** Muller, Jean Pierre, Wouters-Tyrou, Daniele, Erraiss, Nour Eddine, Vedel, Michele, Touzet, Nicole, Mesnard, Jacqueline, Sautiere, Pierre, and Wegnez, Maurice. molecular cloning and expression of a metallothionein mrna in xenopus laevis. *DNA Cell Biol.* (1993) 12(4): 341-9 .
- Anat** Muller, T. 1999. characteristic intraepidermal nerve fibre endings of the intervibrissal fur in the mystacial pad of the rat: morphological details revealed by intravital methylene blue staining and the zinc iodide-osmium tetroxide technique. *Journal of Anatomy* 195(Pt 1): 147-52.
- Alt** Mullin, C. H., Frings, G., Abel, J., Kind, P. P., and Goerz, G. 1987. specific induction of metallothionein in hairless mouse skin by zinc and dexamethasone. *Journal Of Investigative Dermatology* 89(2): 164-166.
- Abstract** Mullis, L. A. and Spears, J. W. 1997. effect of breed (angus vs simmental) and copper and zinc source on mineral status of steers fed high dietary iron. *Journal of Animal Science* 75(SUPPL. 1): 24.
- Mix** Mullis, L. A. J. W. Speers and R. L. McCraw. 2003. effects of breed (angus vs simmental) and copper and zinc source on mineral status of steers fed high dietary iron. *Journal of Animal Science*. 81: 318-322.
- Unrel** Multhaup, G., Mechler, H., and Masters, C. L. 1995. characterization of the high affinity heparin binding site of the alzheimer's disease beta a4 amyloid precursor protein (app) and its enhancement by zinc(ii). *Journal of Molecular Recognition* 8(4): 247-57.
- Mix** Muni, I. A., Gordon, E. B., and Goodband, J. B. 1985. *Dermal, Eye, and Oral Toxicological Evaluations*. <NOTE> Rept. for Nov 83-Dec 84 on Phase 2. BSC-11357
- No COC** Munoz, Amalia and Rodriguez, Adela Rosa. electrochemical behavior of metallothioneins and

related molecules. part iii: metallothionein. *Electroanalysis* (1995) 7(7): 674-80 .

- Abstract** MUNOZ, C., VORMANN, J., and DIETER, H. H. 1911. characterization and development of metallothionein in fetal limb buds brain and liver from the mouse. *29TH SPRING MEETING OF THE DEUTSCHE GESELLSCHAFT FUER PHARMAKOLOGIE UND TOXIKOLOGIE (GERMAN SOCIETY FOR PHARMACOLOGY AND TOXICOLOGY)*
- Diss** Munoz, L. 1997. *Determination of Selenium and Zinc in Rat Plasma by Instrumental Neutron Activation Analysis*. INIS-CL-009
- No COC** Munoz, Leda, Keen, Carl L., Lonnerdal, Bo, and Dewey, Kathryn G. coffee intake during pregnancy and lactation in rats : maternal and pup hematological parameters and liver iron, zinc and copper concentration. *J. Nutr.* (1986) 116(7): 1326-33 .
- Drug** Munyabagisha, L., Westendorf, M. L., Mitchell, G. E. Jr., Gay, N., and Tucker, R. E. 1993. bovine plasma vitamin a responses to selected nutrients, monensin, and endophytic fescue. *International Journal for Vitamin and Nutrition Research* 63(2): 77-81.
- Phys** Murai, K., Murakami, H., and Nagata, S. 1997. a novel form of the myeloid-specific zinc finger protein (mzf-2). *Vol. 2, No. 8, Pp. 581-591* Genes Cells
- Unrel** Murakami, K., Kondo, T., Yang, G., Chen, S. F., Morita-Fujimura, Y., and Chan, P. H. 1999. cold injury in mice: a model to study mechanisms of brain edema and neuronal apoptosis. *Progress in Neurobiology* 57(3): 289-99.
- Phys** Murashima Yoshiya L(A), Kasamo Kimihiro, and Suzuki Jiro. 1998. antiepileptic effects of allopurinol on el mice are associated with changes in sod isoenzyme activities. *Epilepsy Research* 32(1-2): 254-265.
- Nut def** Murata, Ryosuke, Soda, Sachiko, Yamamoto, Akio, Sato, Hiroko, and Ito, Akiharu. effect of zinc on the production of various toxins of clostridium perfringens. *Jap. J. Med. Sci. Biol.* (1969) 22(3): 133-48.
- FL** Muren, Zhang, S., Wang, J., Yan, W., Xu, Z., and Xu, R. 1997. effect of sucrose, bovine serum albumin and zn²⁺ on cryopreservation of goat spermatozoa. *Acta Veterinaria Et Zootechnica Sinica* 28(2): 120-125.
- Phys** Murgia, Chiara, Vespignani, Isabella, Cerase, Joanna, Nobili, Fabio, and Perozzi, Giuditta. cloning, expression, and vesicular localization of zinc transporter dri 27/znt4 in intestinal tissue and cells. *Am. J. Physiol.* (1999) 277(6, Pt. 1): G1231-G1239
- CP** MURILLO FUENTES ML, ARTILLO, R., CARRERAS, O., and MURILLO, M. L. 1998. effect of chronic ethanol ingestion on zinc duodenal absorption and zinc serum levels during pregnancy of lactation in rats. *SCIENTIFIC MEETING OF THE PHYSIOLOGICAL SOCIETY*
- No COC** Murphy, P., Topilko, P., Schneider Maunoury, S., Seitanidou, T., Baron Van Evercooren, A., and Charnay, P. 1996. the regulation of krox-20 expression reveals important steps in the control of peripheral glial cell development. *Vol. 122, No. 9, Pp. 2847-2857* Development
- Nut def** Murray, E., Singer, L., and Ophaug, R. 1981. effects of zinc deficiency and zinc repletion on 3', 5'-cyclic adenosine monophosphate levels in the rat. *Nutrition Reports International*. 24 (4): 689-697.
- Abstract** Murray, E., Singer, L., Ophaug, R. H., and Wong, K. M. effect of zinc deficiency on cyclic amp levels in the rat. *57TH GENERAL SESSION OF THE INTERNATIONAL ASSOCIATION FOR*

DENTAL RESEARCH AND THE ANNUAL SESSION OF THE AMERICAN ASSOCIATION FOR DENTAL RESEARCH, NEW ORLEANS, LA., USA, MAR. 29-APR. 1, 1979. *J DENT RES.* 58 (Spec. Issue A). 1979. 191.

- Nut def** Murray, E. J., Langhaus, B., and Messer, H. H. 1981. the effects of zinc and calcium deficiencies on the rate of bone resorption in the rat. *Nutrition Research.* 1 (1): 107-115.
- Nut def** Murray, E. J. and Messer, H. H. 1981. turnover of bone zinc during normal and accelerated bone loss in rats. *Journal of Nutrition* 111(9): 1641-7.
- Nut def** Murray, Elsa J. and Messer, Harold H. turnover of bone zinc during normal and accelerated bone loss in rats. *J. Nutr. (1981)* 111(9): 1641-7.
- Alt** Murray, F. T., Orth, J., Gunsalus, G., Weisz, J., Li, J. B., Jefferson, L. S., Musto, N. A, and Bardin, C. W. the pituitary testicular axis in the streptozotocin diabetic male rat evidence for gonadotroph sertoli cell and leydig cell dys function. *INT J ANDROL. International Journal of Andrology.* 4 (2). 1981. 265-280.
- No Oral** Murray, M. J., Erickson, K. L., and Fisher, G. L. 1983. effects of supplemental zinc on melanoma metastasis in mice. *Cancer Letters* 18(3): 339-47.
- CP** Murray, M. J., Erickson, K. L., and Fisher, G. L. 1982. the effects of zinc-deficiency on melanoma growth and metastasis in mice. *Federation Proceedings* 41: 358.
- In Vit** Murray, Michael J., Erickson, Kent L., and Fisher, Gerald L. 1983. effects of dietary zinc on melanoma growth and experimental metastasis. *Cancer Lett. (Shannon Irel.)* 21(2): 183-94
- No Oral** Murray, Michael J., Erickson, Kent L., and Fisher, Gerald L. 1983. effects of supplemental zinc on melanoma metastasis in mice. *Cancer Lett. (Shannon Irel.)* 18(3): 339-47
- Diss** Murray, Michael John. 1982. effects of zinc on cellular immunity, melanoma growth and metastasis in mice. Avail.: Univ. Microfilms Int. Order No. DA8227880 From: Diss. Abstr. Int. B 1983, 43. 7. 2157-8. 128 pp.
- Mineral** Murry Acie C Jr(A), Gelaye Deyoum, Casey John M, Foutz Timothy L, Kouakou Brou, and Arora Deepa. 1999. type of milk consumed can influence plasma concentrations of fatty acids and minerals and body composition in infant and weanling pigs. *Journal of Nutrition* 129(1): 132-138.
- CP** Murthy, A. S., Vawter, G. F., Kopito, L., and Rossen, E. 1972. retinal atrophy and cataract in rats following administration of n-methyl-n-nitrosourea. *Proceedings of the Society for Experimental Biology and Medicine*; 139
- Nut def** Murthy, L., Highhouse, S., Levin, L., Menden, E. E., and Petering, H. G. 1975. a study of the combined toxic effects of oral cadmium and lead in rats. *Trace Subst. Environ. Health* : 9, 395-401.
- Nut** Murthy, L., Klevay, L. M., and Petering, H. G. 1974. interrelationships of zinc and copper nutriture in the rat. *Journal of Nutrition* 104(11): 1458-1465.
- Not Avail** Murthy, L. and Petering, H. G. 1971. *Studies in Zinc Metabolism IV. Interactions of Zn and Cd.* <NOTE> Annual Rept
- Abstract** Murthy, L., Petering, H. G., Stemmer, K. L., Gartside, P. S., and Finelli, V. N. effects of a high dietary level of zinc copper and iron on lipid and mineral metabolism in aging male sprague-

dawley rats fed 1 percent cholesterol. *70TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 13-18, 1986. FED PROC. 45 (4). 1986. 1080.*

- CP** Murthy, L., Rice, D. P., and Petering, H. G. 1978. sex differences with respect to the accumulation of oral cadmium in rats. *Trace Elem. Metab. Man Anim. Proc. Int. Symp., 3rd* : Meeting Date 1977, 557-61. Editor(s): Kirchgessner, M. Publisher: Arbeitskreis Tierernaehrungsforschung Weihenstephan Inst. Ernaehrungsphysiol., Freising-Weihenstephan, Ger..
- CP** Murthy, Lalitha, Finelli, Vincent N., and Petering, Harold G. 1979. protective role of essential mineral nutrition on cadmium toxicity. *Manage. Control Heavy Met. Environ. Int. Conf.* 44-7 Publisher: CEP Consultants Ltd., Edinburgh, Scot.
- Fate** Murthy, Lalitha and Petering, Harold G. effect of dietary zinc and copper interrelations on blood parameters of the rat. *J. Agric. Food Chem. (1976) 24(4): 808-11 .*
- FL** Musbah, M., Harris, G. C. Jr., and Waldroup, P. W. 1978. the effects of supplementation of drinking water with zinc, molybdenum, and copper on skin fatty acids and dermatitis in broilers. *Poultry Science 57(4): 1174.*
- Diss** Mutch, P. B. 1973. the effect of zinc deficiency during lactation in rats. *Dissertation Abstracts International, B 34(2): 738-739.*
- Abstract** Mutch, P. B. and Hurley, L. S. zinc deficiency in suckling rats. *FED PROC. Federation Proceedings. 30 (2). 1971 643*
- Diss** Mutch, Patricia B. 1972. effect of zinc deficiency during lactation in rats. Avail.: Univ. Microfilms. Ann Arbor, Mich., Order No. 73-19,098 From: Diss. Abstr. Int. B 1973, 34. 2. 738-9. 112 pp.
- Nut def** Mutch, Patricia B. and Hurley, Lucille S. effect of zinc deficiency during lactation on postnatal growth and development of rats. *J. Nutr. (1974) 104(7): 828-42.*
- Nut def** Mutch, Patricia B. and Hurley, Lucille S. mammary gland function and development : effect of zinc deficiency in rat. *Am. J. Physiol. (1980) 238(1): E26-E31.*
- Unrel** Muto, Norio, Ren, Hong-Wei, Hwang, Gab-Soo, Tominaga, Shinpei, Itoh, Norio, and Tanaka, Keiichi. 1999. induction of two major isoforms of metallothionein in crucian carp (*carassius cuvieri*) by air-pumping stress, dexamethasone, and metals. *Comp. Biochem. Physiol. Part C: Pharmacol., Toxicol. Endocrinol. 122C(1): 75-82.*
- CP** Muzykantov Vladimir R(A), Atochina Elena N, Ischiropoulos Harry, Danilov Sergei M, and Fisher Aron B. 1996. immunotargeting of antioxidant enzymes to the pulmonary endothelium. *Proceedings of the National Academy of Sciences of the United States of America 93(11): 5213-5218.*
- Nut** Myer, R. O., Froseth, J. A., and Coon, C. N. 1982. protein utilization and toxic effects of raw beans (*phaseolus vulgaris*) for young pigs. *Journal of Animal Science 55(5): 1087-1098.*
- No COC** Myers, L. J. and Pugh, R. thresholds of the dog for detection of inhaled eugenol and benzaldehyde determined by electroencephalographic and behavioral olfactometry. *American Journal Of Veterinary Research. Nov 1985. v. 46 (11) p. 2409-2412. ill.*
- CP** Mylroie, A. A. effect of ingested lead on tissue levels of copper, iron, zinc and manganese in rats.

- Abstract** Naber, E. C. and Smathers, S. E. patterns of toxicity and teratogenicity in the chick embryo resulting from the administration of certain nutrients and food additives. *Poultry Science.* 54 (5). 1975 1800
- Nut def** Naber, T. H., Baadenhuysen, H., Jansen, J. B., van den Hamer, C. J., and van den Broek, W. 1996. serum alkaline phosphatase activity during zinc deficiency and long-term inflammatory stress. *Clinica Chimica Acta; International Journal of Clinical Chemistry;* 249
- Fate** Naber, T. H. J., Hamer, C. J. A. van den., Broek, W. J. M. van den., and Roelofs, H. 1994. zinc exchange by blood cells in nearly physiologic standard conditions. *Biological Trace Element Research.* 46(1/2): 29-50.
- Nut def** Naber, T. H. J., Hamer, J. A. van den, Broek, W. J. M. van den, and Tongeren, J. H. M. van. 1992. zinc uptake by blood cells of rats in zinc deficiency and inflammation. *Biological Trace Element Research.* 35(2): 137-152.
- Sludge** Nachtomi, E., Lipstein, B., Iosif, B., and Alumot, E. 1984. retention of minerals from activated sludge in growing chicks. *Nutrition Reports International* 29(3): 511-517.
- Nut** Nagabhushana, V. and Das, T. K. 1996. effect of supplemental zinc and copper on the growth rate in crossbred heifer calves. *Mysore Journal of Agricultural Sciences* 30(1): 76-80.
- Nut def** Nagai, K. 1989. [studies of metabolic abnormality of zinc in chronic liver diseases (report 2)--basic examination of its effects on pathophysiology]. *Nippon Shokakibyo Gakkai Zasshi* 86(1): 39-44.
- Nut def** Nagai, Kozo. studies of metabolic abnormality of zinc in chronic liver diseases (report-2). basic examination of its effects on pathophysiology. *Nippon Shokakibyo Gakkai Zasshi (1989)* 86(1): 39-44.
- Drug** Nagano, Seiichi, Ogawa, Yasuko, Yanagihara, Takehiko, and Sakoda, Saburo. 1999. benefit of a combined treatment with trientine and ascorbate in familial amyotrophic lateral sclerosis model mice. *Vol. 265, No. 3, Pp. 159-162 Neuroscience Letters*
- No COC** NAGANUMA, A., SATOH, M., KOYAMA, Y., and IMURA, N. 1985. protective effect of metallothionein induced metals on lethal toxicity of cis diamminedichloroplatinum in mice. *TOXICOL LETT (AMST);* 24 (2-3): 203-208.
- Nut def** Naganuma, M., Ikeda, M., and Tomita, H. 1988. changes in soft palate taste buds of rats due to aging and zinc deficiency--scanning electron microscopic observation. *Auris, Nasus, Larynx* 15(2): 117-27.
- No Oral** Nagatomo, Itsugi, Akasaki, Yasuaki, Uchida, Masahiro, Kuchiiwa, Satoshi , Nakagawa, Shiro, and Takigawa, Morikuni. influence of dietary zinc on convulsive seizures and hippocampal nadph diaphorase-positive neurons in seizure susceptible el mouse. *Brain Res. (1998)* 789(2): 213-220.
- CP** Nagele Arno. 1995. influence of the sod-mimetic complex cu-pupy on cellular redox systems, adenylates, and cell survival. *Biochemical Society Transactions* 23(2): 255S.
- In Vit** Nagle, W. A., Soloff, B. L., Moss, A. J. Jr, and Henle, K. J. 1990. cultured chinese hamster cells undergo apoptosis after exposure to cold but nonfreezing temperatures. *Cryobiology* 27(4):

439-51.

- No Oral** Nagler, R., Marmary, Y., Golan, E., and Chevion, M. novel protection strategy against x-ray-induced damage to salivary glands. *Radiat. Res.* (1998) 149(3): 271-276.
- Nut** Nagpal, A. K., Sahani, M. S., and Roy, A. K. 1998. growth, feed utilization efficiency and nutrient utilisation in growing camel calves. *Indian Journal of Animal Production and Management* 14(1): 1-4.
- Drug** Nagyova, Anna and Ginter, E. response of hepatic drug-metabolizing enzymes to immobilization stress in rats of various ages. *Acta Physiol. Hung.* (1993) 81(1): 29-35.
- Mix** Nair N(A), Bedwal, R. S., and Mathur, R. S. 1995. zinc, copper and hydrolytic enzymes in hydrocortisone treated sprague-dawley rats: i. testes. *Trace Elements and Electrolytes* 12(1): 7-19.
- Phys** Nair, Neena, Bedwal, R S, and Mathur, R S. effect of adrenalectomy and adrenalectomy + hydrocortisone treatment on histopathological, biochemical and zinc and copper profiles in rat testes. *Indian J. Exp. Biol.* (1995) Volume Date 1995, 33(9): 655-63.
- No COC** Nair Neena, Bedwal, R. S., and Mathur, R. S. 1998. zinc, copper and hydrolytic enzymes in epididymis of hydrocortisone treated rat. *Indian Journal of Experimental Biology* 36(1): 22-33.
- Alt** Nair, Neena, Edwards, M. S., Bedwal, R. S., and Mathur, R. S. 1987. effect of adrenalectomy and adrenalectomy-hydrocortisone treatment on zinc, biochemical parameters and histology of testes of rats. *Indian J. Exp. Biol.* 25(10): 651-9.
- HHE** Nair Satish K, Krebs Joseph F, Christianson David W, and Fierke Carol A(A). 1995. structural basis of inhibitor affinity to variants of human carbonic anhydrase ii. *Biochemistry* 34(12): 3981-3989.
- No COC** Najda, Jacek, Gminski, Jan, Drozd, Marian, and Danch, Alojzy. silicon metabolism. the interrelations of inorganic silicon (si) with systemic iron (fe), zinc (zn), and copper (cu) pools in the rat. *Biol. Trace Elem. Res.* (1992) 34(2): 185-95.
- Gene** Nakagawa, R., Sato, R., Futai, M., Yokosawa, H., and Maeda, M. 1997. gastric gata-6 dna-binding protein: proteolysis induced by camp. *FEBS Letters* 408(3): 301-5.
- Nut def** Nakajima, Katsuyuki and Suzuki, Keiji. the cytotoxic effect of endotoxin on bone marrow cells in zinc deficient rats. *Tohoku J. Exp. Med.* (1996) 179(3): 183-191.
- Abstract** Nakamoto, T. effects of caffeine on tooth germ development in newborn rats. *18TH ANNUAL SESSION OF THE AMERICAN ASSOCIATION FOR DENTAL RESEARCH, SAN FRANCISCO, CALIFORNIA, USA, MARCH 15-19, 1989. J DENT RES.* 68 (Spec. Issue). 1989. 281.
- CP** Nakamoto, T. effects of zinc supplementation to a caffeine diet on developing teeth. *69TH GENERAL SESSION OF THE INTERNATIONAL ASSOCIATION FOR DENTAL RESEARCH, 20TH ANNUAL SESSION OF THE AMERICAN ASSOCIATION FOR DENTAL RESEARCH, AND THE 12TH ANNUAL SESSION OF THE MEXICAN DIVISION OF THE IADR (INTERNATIONAL ASSOCIATION FOR DENTAL RESEARCH), ACAPULCO, MEXICO, APRIL 17-21, 1991. J DENT RES.* 70 (Spec. Issue April). 1991. 336.
- Abstract** Nakamoto, T. interaction between caffeine and zinc on newborn rat brain. *73RD ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, NEW ORLEANS, LOUISIANA, USA, MARCH 19-23, 1989. FASEB (FED AM SOC*

EXP BIOL) J. 3 (3). 1989. A463.

- CP** Nakamoto, T., Gottschalk, S., Yazdani, M., and Rossowska, M. alteration of mandibular growth by caffeine and zinc supplemented diets. *68TH GENERAL SESSION OF THE INTERNATIONAL ASSOCIATION FOR DENTAL RESEARCH AND THE 19TH ANNUAL SESSION OF THE AMERICAN ASSOCIATION FOR DENTAL RESEARCH, CINCINNATI, OHIO, USA, MARCH 7-11, 1990. J DENT RES. 69 (Spec. Issue Mar.). 1990. 293.*
- Drug** Nakamoto, T., Gottschalk, S. B., Yazdani, M., and Joseph, F. Jr. combined effects of caffeine and zinc in the maternal diet on fetal brains. *FASEB J 1991;5(5):A1319*
- No COC** Nakamoto, T., Grant, S., and Yazdani, M. the effects of maternal caffeine intake during pregnancy on mineral contents of fetal rat bone. *Res. Exp. Med. (1989) 189(4): 275-80.*
- FL** Nakamoto, T., Hartman, A. D., and Joseph, F. Jr. 1989. interaction between caffeine intake and nutritional status on growing brains in newborn rats. *Annals Of Nutrition And Metabolism. 33(2): 92-99.*
- Unrel** Nakamoto, T., Joseph, F. Jr, Yazdani, M., and Hartman, A. D. 1988. effects of different levels of caffeine supplemented to the maternal diet on the brains of newborn rats and their dams. *Toxicology Letters 44(1-2): 167-75.*
- CP** Nakamoto, T., Roy, G., Gottschalk, S. B., and Yazdani, M. chronic caffeine intake in early life permanently affects brain composition and behavior in later life in rats. *74TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, PART I, WASHINGTON, D.C., USA, APRIL 1-5, 1990. FASEB (FED AM SOC EXP BIOL) J. 4 (3). 1990. A538.*
- CP** Nakamoto, T., Wink, C. S., Rossowska, M. J., and Yazdani, M. 1999. effects of caffeine on the ultrastructure of cardiac mitochondria in growing rats. *FASEB Journal 13(4 PART 1): A219.*
- Abstract** NAKAMOTO, T., YAZDANI, M., and GRANT, S. 1988. effects of different levels of maternal caffeine intake during pregnancy on mandibular growth of fetal rats. *66TH GENERAL SESSION OF THE INTERNATIONAL ASSOCIATION FOR DENTAL RESEARCH*
- FL** Nakamoto, Tetsuo, Hartman, Arthur D., and Joseph, Fred Jr. interaction between caffeine intake and nutritional status on growing brains in newborn rats. *Ann. Nutr. Metab. (1989) 33(2): 92-9.*
- Drug** Nakamoto, Tetsuo and Joseph, Fred Jr. interaction between caffeine and zinc on brain in newborn rats. *Biol. Neonate (1991) 60(2): 118-26.*
- Drug** Nakamoto, Tetsuo, Roy, Gregg, Gottschalk, Sheila B., Yazdani, Malektaj, and Rossowska, Magdalena. lasting effects of early chronic caffeine feeding on rats ' behavior and brain in later life. *Physiol. Behav. (1991) 49(4): 721-7.*
- Bio Acc** Nakamura, Hisao, Uesaka, Fumito, Asonuma, Kaori, and Yoshizawa, Minako. 1995. determination of zinc contents in barley and protective effect of zinc on water-immersion-induced stress ulcer of rats. *Koshien Daigaku Kiyo A 22: 35-9.*
- Alt** Nakamura, Hisao, Uesaka, Fumito, Asonuma, Kaoru, Nakagawa, Rie, and Yoshizawa, Minako. 1997. protective effects of zinc and selenium on gastric stress ulcer induced by water immersion in rats. *Koshien Daigaku Kiyo A 24: 15-18.*
- No COC** Nakamura, Kaoru, Hayakawa, Takashi, Takita, Toshichika, Fukutomi, Asako, Saigo, Mitsuhiko,

- Suzuki, Kazuharu, Goto, Shiro, Innami, Satoshi, Fukui, Yoshitaka, and et al. 1988. dietary fiber effects of microfibrillated cellulose-carbohydrate mixture. ii. effect of intake of microfibrillated cellulose-carbohydrate mixture on growth, fecal weight, and gastrointestinal transit time in rats. *Nippon Eiyo Shokuryo Gakkaishi* 41(3): 191-6.
- FL** Nakamura, Kenichi, Nishiyama, Shoji, Takata, Tsutomu, Suzuki, Eiko, Sugiura, Yumiko, and Kobayashi, Terumi. effects of zinc on cadmium-induced ultrastructural changes in rat livers. *Sangyo Igaku (1981)* 23(1): 141-5.
- FL** Nakamura, Kenichi, Takata, Tsutomu, Suzuki, Eiko, Sugiura, Yumiko, and Kobayashi, Terumi. effects of calcium deficiency on the in vivo interaction of cadmium and zinc. *Nippon Eiseigaku Zasshi (1981)* 35(6): 851-7.
- Nut def** Nakamura, Kikuhiko. experimental study on zinc metabolism and pancreatic function in the fibrotic pancreas after pancreatic duct ligation in dogs. *Suizo (1991)* 6(4): 393-405.
- Alt** Nakamura Manabu T, Phinney Stephen D(A), Tang Anna B, Oberbauer Anita M, German, J. Bruce, and Murray James D. 1996. increased hepatic delta-6-desaturase activity with growth hormone expression in the mg101 transgenic mouse. *Lipids* 31(2): 139-143.
- FL** Nakamura, Shoichi, Tanaka, Katsumi, Sono, Tadashi, Tanaka, Takayuki, Tokuchi, Mikio, Yamamoto, Yoshio, Yoshimoto, Kanji, Nakagawa, Toshiyuki, and Komura, Setsuo. studies on antimony poisoning. ii. *Shiga-Kenritsu Eisei Kankyo Senta Shoho (1981)* : 16, 88-94.
- FL** Nakanishi, Takeo and Izumimoto, Masatoshi. color of meat. vi. effect of zinc in feed on chicken muscle color. *Rakuno Kagaku No Kenkyu (1972)* 21(2): A53-A58.
- Unrel** Nakao Naoyuki(A), Frodl Eva M, Widner Hakan, Carlson Elaine, Eggerding Faye A, Epstein Charles J, and Brundin Patrik . 1995. overexpressing cu/zn superoxide dismutase enhances survival of transplanted neurons in a rat model of parkinson's disease. *Nature Medicine* 1(3): 226-231.
- Herp** Nakata Katsunori, Nagai Takeharu, Aruga Jun(A), and Mikoshiba Katsuhiko. 1998 . xenopus zic family and its role in neural and neural crest development. *Mechanisms of Development* 75(1-2): 43-51.
- In Vit** Nakatani, T., Kennedy, D. O., Murakami, Y., Yano, Y., Otani, S., and Matsui-Yuasa, I. 1998. restricted zn(2+) availability affects the antizyme-dependent ornithine decarboxylase degradation pathway in isolated primary cultured rat hepatocytes. *Biochemical And Biophysical Research Communications*. 243(3): 797-800.
- In Vit** Nakatani, Teruyo, Ohtani, Kimiko, Yano, Yoshihisa, Otani, Shuzo, and Matsui-Yuasa, Isao. the requirement of zn2+ for the increase in ornithine decarboxylase induced by insulin and epidermal growth factor in primary cultured rat hepatocytes. *J. Nutr. Biochem. (1996)* 7(7): 386-391.
- Alt** Nakatani Toshiya, Inouye Masayori, and Mirochnitchenko Oleg(A). 1997. overexpression of antioxidant enzymes in transgenic mice decreases cellular ploidy during liver regeneration. *Experimental Cell Research* 236(1): 137-146.
- Nut def** Nakatsuka, M., Ohta, T., Shibata, Y., Haneda, M., and Tanaka, T. magnesium and zinc in tryptophan and tyrosine metabolism in diabetes. *Biomed. Res. Trace Elem. (1990)* 1(2): 277-8
- Abstract** NAKAURA, S., KAWANISHI, T., OHNO, Y., KAWASHIMA, K., TANAKA, S., TAKAHASHI, A., TAKANAKA, A., OMORI, Y., and MATUMOTO, K. 1985. fetal toxicity of zinc ethylphenyldithiocarbamate 3 mechanism of formation of methemoglobin caused by zinc

ethylphenyldithiocarbamate. *21ST ANNUAL MEETING OF THE JAPANESE SOCIETY OF TOXICOLOGICAL SCIENCES*

- FL** Nakaura, S., Tanaka, S., Kawashima, K., Takanaka, A., and Omori, Y. 1984. [effects of zinc diethyldithiocarbamate on the prenatal and postnatal developments of the rats]. *Eisei Shikenjo Hokoku* (102): 55-61.
- Org Met** NAKAURA, S., TANAKA, S., KAWASHIMA, K., TAKANAKA, A., and OMORI, Y. teratological studies of zinc ethylphenyldithiocarbamate(zepc),a vulcanization accelerator for rubbers,in rats. *J TOXICOL SCI* 8:337,1983
- Org Met** Nakaya, Fumio, Tanikawa, Tsutomu, Kikuchi, Yuji, Takahashi, Haruo, and Koishi, Masumi. evaluation of zinc phosphide microcapsule for uptake and lethal efficacy in mice and voles. *Zairyo Gijutsu* (1995) 13(5): 154-9.
- Phys** Nakayama, H., Scott, I. C., and Cross, J. C. 1998. the transition to endoreduplication in trophoblast giant cells is regulated by the msna zinc finger transcription factor. *Developmental Biology* 199(1): 150-63.
- Plant** Nambiar, K. K. M. and Motiramani, D. P. effect of zinc nutrition on the yield and nutrient composition of chickpea (cicer arietinum l.) as related to four soil types. *Z. Acker- Pflanzbau* (1983) 152(3): 165-72.
- No COC** Nandy, P., Sinha, R. K., and Halder, K. effect of locust bean gum on liver and serum cholesterol and on some trace elements of liver. *J. Inst. Chem. (India)* (1987) 59(2): 125-6 .
- No Oral** Narbaitz, Roberto, Riedel, Karen D., and Kacew, Sam. induction of feather malformations in chick embryos by cadmium: protection by zinc. *Teratology* (1983) 27(2): 207-13.
- Nut def** Narita, N., Bielinska, M., and Wilson, D. B. 1997. wild-type endoderm abrogates the ventral developmental defects associated with gata-4 deficiency in the mouse. *Developmental Biology* 189(2): 270-4.
- HHE** Nartey, N. O., Banerjee, D., and Cherian, M. G. 1987. immunohistochemical localization of metallothionein in cell nucleus and cytoplasm of fetal human liver and kidney and its changes during development. *Pathology* 19(3): 233-8.
- Nut def** Nash, Leonard, Iwata, Tsutomu, Fernandes, Gabriel, Good, Robert A., and Incefy, Genevieve S. effect of zinc deficiency on autologous rosette-forming cells. *Cell. Immunol.* (1979) 48(1): 238-43.
- Drug** Nash, T. and Rice, W. G. 1998. efficacies of zinc-finger-active drugs against giardia lamblia. *Antimicrobial Agents and Chemotherapy* 42(6): 1488-92.
- Mineral** Nasi, J. M., Helander, E. H., and Partanen, K. H. 1995. availability for growing pigs of minerals and protein of a high phytatebarley-rapeseed meal diet treated with aspergillus niger phytase orsoaked with whey. *Animal Feed Science and Technology* 56(1/2): 83-98.
- Prim** Nasjleti, C. E., Castelli, W. A., and Blankenship, J. R. 1975. the storage of teeth before reimplantation in monkeys. a histologic study. *Oral Surgery, Oral Medicine, and Oral Pathology* 39(1): 20-9.
- Nut def** Nassir, Fatiha, Blanchard, Raymond K., Mazur, Andrzej, Cousins, Robert J., and Davidson, Nicholas O. apolipoprotein b mrna editing is preserved in the intestine and liver of zinc-deficient rats. *J. Nutr.* (1996) 126(4): 860-4.

- CP** NATH, R., PALIWAL, V. K., PRASAD, R., and KAMBADUR, R. 1952. role of metallothionein in metal detoxification and metal tolerance in protein calorie malnutrition and calcium deficient monkeys of macaca-mulatta. *KAGI*
- CP** Naughton Cathy K, Tourtellotte Warren G, Catalona William J, and Milbrandt Jeffrey. 1997. prostate apoptosis in response to castration in wild type and ngfia-deficient mice. *Journal of Urology* 157(4 SUPPL.): 226.
- Drug** Navarro, C., Ramis, A., Sendros, S., Bulbena, O., Ferrer, L., and Escolar, G. relationship between gastric levels and antiulcerogenic activity in zinc. *Archives Internationales De Pharmacodynamie Et De Therapie.* 307 (0). 1990. 119-129.
- FL** Navarro, M. P., Duarte, T., Perez-Granados, A. M., and Vaquero, M. P. 1990. [pregnant rats consuming diets with uncooked and fried olive oil, mineral levels in their offspring and changes in their body storage levels]. <original> estudio en ratas gestantes del consumo de dietas con aceite de oliva crudo y frito sobre la mineralizacion de la camada y la evolucion en sus almacenos corporales. *Nutricion Hospitalaria* 5(3): 153-7.
- Alt** Navarro, M. P., Vaquero, M. P., Castrillon, A. M., and Varela, G. nutritive utilization of protein and minerals modulated by the pattern of dietetic fat. *Grasas y Aceites.* 36 (1). 1985. 25-29.
- No COC** Navarro, M. P., Vaquero, M. P., Castrillon, A. M., and Varela, G. 1988. several aspects of mineral/protein nutrition in relation to consumption of an oil involved in the toxic syndrome. *Food and Chemical Toxicology* 26(9): 759-65.
- No Oral** Nave, Joy M. and Connor, John D. influence of zncl2 pretreatment on behavioral and histological responses to kainic acid in rats. *Brain Res. (1993)* 604(1-2): 298-303.
- No Oral** Nave Joy M and Connor John D(A) . 1993. influence of zinc chloride-2 pretreatment on behavioral and histological response to kainic acid in rats. *Brain Research* 604(1-2): 298-303.
- BioAcc** Naveh, Y., Kemp, F. W., Holding, K., Bruening, K. S., and Bogden, J. D. relationships among tissue trace element and major mineral concentrations in the rat. *Trace Elements in Medicine.* 5 (1). 1988. 12-15.
- No Oral** Naveh, Y., Lee-Ambrose, L. M., Samuelson, D. A., and Cousins, R. J. 1993 . malabsorption of zinc in rats with acetic acid-induced enteritis and colitis. *The Journal Of Nutrition.* 123(8): 1389-1395.
- Nut def** Naveh, Yehezkel, Diamond, Eric, Waldner, Eli, and Bogden, John D. effect of zinc-deficient diet of varying duration on intestinal disaccharidase activity in the rat. *J. Pediatr. Gastroenterol. Nutr. (1990)* 10(1): 102-6.
- Drug** Navia, J. M. 1974. *Experimental Study of Wound Healing on Bone and Oral Tissue in Two Experimental Animal Model Systems: Effect of Dietary Zinc, Phosphate Supplements and Calcitonin in Bone Healing.* <NOTE> Final Rept. Jun 60-Jul 71
- Alt** Navia, Juan M. experimental study of wound healing on bone and oral tissue in two experimental animal model systems. effect of dietary zinc, phosphate supplements, and calcitonin in bone healing. *U. S. NTIS AD-A Rep.* 1974. No. 008036, 109 Pp. Avail.: NTIS From: Gov. Rep. Announce. Index (U. S.) 1975, 75(12), 53.
- Nut def** Nawar, Ola, Akridge, Robert E., Hassan, Ezzat, El Gazar, Ragaa, Doughty, Barbara L., and Kemp, W. M. the effect of zinc deficiency on granuloma formation, liver fibrosis, and antibody responses in experimental schistosomiasis. *Am. J. Trop. Med. Hyg. (1992)* 47(3): 383-9

- HHE** Nazareth, L. V., Harbour, D. V., and Thompson, E. B. 1991. mapping the human glucocorticoid receptor for leukemic cell death. *Journal of Biological Chemistry* 266(20): 12976-80.
- Unrel** Nazki, A. R. and Rattan, P. J. S. 1990. status of blood micro-elements during different seasons in sheep. *Indian Veterinary Journal* 67(3): 274-276.
- Unrel** Neal, D. E. Jr(A), Kaack, M. B., Fussell, E. N., and Roberts, J. A. 1993. changes in seminal fluid zinc during experimental prostatitis. *Urological Research* 21(1): 71-74.
- CP** Neathery, M. W., Crowe, C. T., Hartnell, G. F., and Veenhuizen, J. J. influence of sometribove on zinc metabolism and tissue mineral concentration in dairy calves. *83RD ANNUAL MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE, LARAMIE, WYOMING, USA, AUGUST 6-9, 1991. J ANIM SCI.* 69 (Suppl. 1). 1991. 550-551. CP.
- Nut def** Neathery, M. W., Lassiter, J. W., Miller, W. J., and Gentry, R. P. 1975. absorption, excretion and tissue distribution of natural organic andinorganic zinc-65 in the rat. *Proceedings of the Society for Experimental Biology and Medicine* 149(1): 1-4.
- Food** Neathery, M. W., Miller, W. J., Blackmon, D. M., and Gentry, R. P. performance and milk zinc from low zinc intake in holstein cows. *Journal of Dairy Science.* 56 (2). 1973 212-217.
- Nut def** Neathery, M. W., Miller, W. J., Blackmon, D. M., Pate, F. M., and Gentry, R. P. 1973. effects of long term zinc deficiency on feed utilization, reproductive characteristics, and hair growth in the sexually mature male goat. *Journal of Dairy Science* 56(1): 98-105.
- Abstract** Neathery, M. W., Miller, W. J., Gentry, R. P., and Blackmon, D. M. effects of feeding a low zinc diet to dairy cows on performance and zinc content of milk. *Journal of Dairy Science.* 55 (5). 1972 706-707
- Abstract** Neathery, M. W., Miller, W. J., Kincaid, R. L., Gentry, R. P., Ansari, M. S., and Lassiter, J. W. zinc homeostasis in various animal species and poultry. *Journal of Dairy Science.* 60 (Suppl 1). 1977 117
- Nut def** Neathery, M. W., Miller, W. P., Blackmon, D. M., Gentry, R. P., and Jones, J. B. absorption and tissue zinc content in lactating dairy cows as affected by low dietary zinc. *Journal of Animal Science.* 37 (3). 1973 848-852.
- No COC** Neathery, M. W., Moos, W. H., Wyatt, R. D., Miller, W. J., Gentry, R. P., and George, L. W. 1980. effects of dietary aflatoxin on performance and zinc metabolism indairy calves. *Journal of Dairy Science* 63(5): 789-799 .
- CP** Neathery, M. W., Moos, W. H., Wyatt, R. W., Miller, W. J., Gentry, R. P., Smith, G., and Heinmiller, S. 1980. aflatoxicosis and zinc metabolism in dairy calves. *Journal of Dairy Science* 63(Suppl.1): 145-146.
- Nut def** Neathery, M. W., Rachmat, S., Miller, W. J., Gentry, R. P., and Blackmon, D. M. 1972. effect of chemical form of orally administered 65zn on absorption andmetabolism in cattle. *Proceedings of the Society for Experimental Biology and Medicine* 139(3): 953-956.
- Drug** Nebbia, C., Dacasto, M., Valenza, F., Burdino, E., Ugazio, G., and Fink-Gremmels, J. 1995. effects of the subchronic administration of zinc ethylene-bis-dithiocarbamate (zineb) to rabbits. *Veterinary And Human Toxicology.* 37(2): 137-142.
- No COC** Nebbia, C. Dacasto M. Valenza F. Burdino E. Ugazio G. and Fink-Gremmels J. 1995. effects of the subchronic administration of zinc ethylene-bis-dithiocarbamate (zineb) to rabbits.

Vet.Hum.Toxicol. 37(2): 137-142.

- Unrel** Needleman David S, Leeper Lucy L, Nanthakumar Nanda N, and Henning Susan J= (A). 1993. hormonal regulation of the mrna for cysteine-rich intestinal protein in rat jejunum during maturation. *Journal of Pediatric Gastroenterology and Nutrition* 16(1): 15-22.
- Surv** Negro, J. J., Donazar, J. A., Hiraldo, F., Hernandez, L. M., and Fernandez, M. A. 1993. organochlorine and heavy metal contamination in non-viable eggs and its relation to breeding success in a spanish population of lesser kestrels (*falco naumanni*). *ENVIRON POLLUT.* 82(2): p201-205.
- Rev** Nehlig, A. and Debry, G. 1994. potential teratogenic and neurodevelopmental consequences of coffee and caffeine exposure: a review on human and animal data. *Neurotoxicology and Teratology* 16(6): 531-43.
- No Oral** Neiko, N. N. effect of ethymizol on the quantitative composition of trace elements and metal proteins in fetal asphyxia. *Byull. Eksp. Biol. Med.* (1973) 76(9): 56-8 .
- Unrel** Nelson, D. G. A., Coote, G. E., Vickridge, I. C., and Suckling, G. 1989. proton microprobe determination of fluorine profiles in the enamel and dentine of erupting incisors from sheep given low and high daily doses of fluoride. *Archives of Oral Biology* 34(6): 419-429.
- Surv** Nelson, D. R., Wolff, W. A., Blodgett, D. J., Luecke, B., Ely, R. W., and Zachary, J. F. 1984. zinc deficiency in sheep and goats: three field cases. *Journal of the American Veterinary Medical Association* 184(12): 1480-1485.
- HHE** Nelson, L. S., Jacobs, F. A., and Brushmiller, J. G. 1985. solubility of calcium and zinc in model solutions based on bovine and human milks. *Journal Of Inorganic Biochemistry* 24(4): 255-265.
- No Dose** NELSON, R. J., FLEMING, A. S., WYSOCKI, C. J., SHINDER, T. W., and ZUCKER, I. chemosensory and neural influences on photoperiodic responsiveness of laboratory rats. *NEUROENDOCRINOLOGY*; 40 (4). 1985. 285-290.
- In Vit** Nelson, Robert B. and Siman, Robert. 1989. identification and characterization of calcium-dependent metalloproteases in rat brain. *J. Neurochem.* 53(2): 641-7 .
- Model** Nelson Y.M., Thampy R.J., Motelin G.K., Raini J.A., DiSante C.J., and Lion L.W.*. 1998. model for trace metal exposure in filter-feeding flamingos at alkaline rift valley lake, kenya. *Environmental Toxicology and Chemistry* 17(11): pp. 2302-2309.
- Gene** Nemer, G., Qureshi, S. T., Malo, D., and Nemer, M. 1999. functional analysis and chromosomal mapping of gata5, a gene encoding a zinc finger dna-binding protein. *Mammalian Genome* 10(10): 993-999.
- Abstract** Nemer Georges(A) and Nemer Mona(A). 1999. ontogeny and functional characterization of the rat gata-5 protein. *Circulation* 110(18 SUPPL.): I131.
- Carcin** Neporadnyi, D. D. level of zinc and cobalt in a tumor and some rat organs and tissues during the development of the mtkh sarcoma. *Mikroelem. Med.* (1971) : No. 2, 88-92 .
- Surv** Newar, S., Baruah, K. K., Baruah, B., Anubha Baruah, and Bhuyan, D. 1999. studies on certain micromineral status in anoestrus and cyclic postpartum swamp buffaloes. *Indian Journal of Animal Research* 33(2): 134-136.

Carcin	Newberne, P. M., Charnley, G., Adams, K., Cantor, M., Roth, D., Supharkarn, V., and Fong, L. gastric and esophageal carcinogenesis: models for the identification of risk and protective factors. <i>Food Chem. Toxicol.</i> (1986) 24(10-11): 1111-19 .
Unrel	Nezu, Riichiro, Takagi, Yoji, Ito, Toshinori, Matsuda, Hikaru, and Okada, Akira. the importance of total parenteral nutrition-associated tissue zinc distribution in wound healing. <i>Surg. Today</i> (1999) 29(1): 34-41
Nut def	Ng, W. L., Fong, L. Y., and Newberne, P. M. 1984. forestomach squamous papillomas in the rat: effect of dietary zinc deficiency on induction. <i>Cancer Letters</i> 22(3): 329-32.
No COC	Ngian, M. F., Nah, K. C., and Thiruchelvam, S. 1979. an evaluation of feed additives (zinc bacitracin, olaquinox, flavomycin, nitrovin and oxytetracycline) for broiler production. <i>Singapore Journal of Primary Industries</i> 7(2): 62-68.
Drug	Niamonitos, C., Shklar, G., and Krakow, A. A. 1985. effects of vitamin e dietary supplements on the exposed dental pulp in rats. <i>Oral Surgery, Oral Medicine, and Oral Pathology</i> 59(6): 627-36.
No COC	Nichols, R. A. and Shooter, E. M. 1985. subunit interactions of the nerve and epidermal growth factor complexes: protection of the biological subunit from proteolytic modification. <i>Developmental Neuroscience</i> 7(4): 216-29.
No Oral	Nicholson, J. K. Osborn D. and Kendall M. D. 1984. comparative distributions of zinc, cadmium and mercury in the tissues of experimental mice. <i>Comp.Biochem.Physiol.C.</i> 77(2): 249-256.
In Vit	Nie, D., Genge, B. R., Wu, L. N., and Wuthier, R. E. 1995. defect in formation of functional matrix vesicles by growth plate chondrocytes in avian tibial dyschondroplasia: evidence of defective tissue vascularization. <i>Journal of Bone and Mineral Research</i> 10(11): 1625-34.
Nut def	Nielsen, F. H., Sunde, M. L., and Hoekstra, W. G. 1968. alleviation of the leg abnormality in zinc-deficient chicks by histamine and by various anti-arthritis agents. <i>Journal of Nutrition</i> 94(4): 527-33.
Nut def	Nielsen, Forrest H., Dowdy, Richard P., and Ziporin, Zigmund Z. effect of zinc deficiency on sulfur-35 and hexosamine metabolism in the epiphyseal plate and primary spongiosa of the chick. <i>J. Nutr.</i> (1970) 100(8): 903-7.
Bio Acc	Nielsen, Forrest H. and Shuler, Terrence R. effect of form of iron on nickel deprivation in the rat . liver content of copper, iron, manganese, and zinc. <i>Biol. Trace Elem. Res.</i> (1981) 3(3): 245-56.
Mineral	Nielsen, Forrest H. and Shuler, Terrence R. studies of the interaction between boron and calcium, and its modification by magnesium and potassium in rats . effects on growth , blood variables, and bone mineral composition. <i>Biol. Trace Elem. Res.</i> (1992) 35(3): 225-37.
Mineral	Nielsen, Forrest H., Shuler, Terrence R., and Uthus, Eric O. dietary arginine and methionine effects, and their modification by dietary boron and potassium, on the mineral element composition of plasma and bone in the rat. <i>J. Trace Elem. Exp. Med.</i> (1992) 5(4): 247-59.
Gene	Nieto, M. A., Bradley, L. C., and Wilkinson, D. G. conserved segmental expression of krox-20 in the vertebrate hindbrain and its relationship to lineage restriction. BRAY, D., ET AL. (ED.). DEVELOPMENT SUPPLEMENT, 2. NERVE CELL DEVELOPMENT; JOINT BRITISH SOCIETY FOR CELL BIOLOGY AND BRITISH SOCIETY FOR DEVELOPMENTAL BIOLOGY SYMPOSIUM, LEEDS, ENGLAND, UK, APRIL 1991. VI+171P. THE COMPANY OF

BIOLOGISTS LTD.: CAMBRIDGE, ENGLAND, UK. ILLUS. ISBN 0-948601-32-9. 0 (0). 1991. 59-62.

- Gene** Nieto, M. A., Sargent, M. G., Wilkinson, D. G., and Cooke, J. 1994. control of cell behaviour during vertebrate development by slug, a zincfinger gene. *Science (Washington)* 264(5160): 835-839.
- Unrel** Nieto, M. Angela(A), Gilardi-Hebenstreit Pascale, Charnay Patrick, and Wilkinson David G. 1992. a receptor protein tyrosine kinase implicated in the segmental patterning of the hindbrain and mesoderm. *Development (Cambridge)* 116(4): 1137-1150.
- Meth** Nieto, Oscar and Rodriguez, Adela Rosa. complexation properties of the metallothionein fragment lys-cys-thr-cys-cys-ala [56-61] mt i with zinc using square wave voltammetry. *Bioelectrochem. Bioenerg.* (1996) 40(2): 215-222.
- HHE** Niewoehner, C. B., Allen, J. I., Boosalis, M., Levine, A. S., and Morley, J. E. 1986. role of zinc supplementation in type-ii diabetes-mellitus. *American Journal Of Medicine* 81(1): 63-68.
- FL** Niiro, Hideo. relationships between copper concentration of hair and other tissues in rats. *Shokumotsu Gakkaishi (Kyoto Joshi Daigaku)* (1987) : 42, 1-7 .
- Nut** Niiyama, Y., Sakamoto, S., and Horio, H. 1988. efficiency of utilization of soya protein isolate hydrolysate (spt-5)and its effect on calcium and zinc bioavailabilities in pregnant rats. *Nutritional Science of Soy Protein, Japan* 9(1): 66-71.
- Nut** Niiyama, Yoshiaki, Sakamoto, Sadaichi, Okada, Kazuko, Matsuo, Takaharu, and Kimoto, Minoru. effects of phytate removal from spi hydrolyzate on the calcium and zinc bioavailabilities in the growing rats. *Daizu Tanpakushitsu Eiyo Kenkyukai Kaishi* (1992) 13(1): 80-5.
- BioX** Nikai, T., Mori, N., Kishida, M., Sugihara, H., and Tu, A. T. 1984. isolation and biochemical characterization of hemorrhagic toxin f from the venom of crotalus atrox (western diamondback rattlesnake). *Archives of Biochemistry and Biophysics* 231(2): 309-19.
- Anat** Niklowitz, W. J. 1971. the interaction of hippocampal granular cells with oso 4 -zinc iodide stain. *Acta Anatomica* 80(1): 114-26.
- Anat** Niklowitz, W. J. 1972. the interaction of hippocampal tissue of the rabbit with oso 4 -zinc iodide stain after treatment with 3-acetylpyridine, reserpine and iproniazid. *Acta Anatomica* 81(4): 570-85.
- Drug** Nikoleit, J. R., Peyman, G. A., Lagouros, P., and Fiscella, R. 1988. retinal toxicity of intravitreal ethyldeoxyuridine and zinc. *Annals of Ophthalmology.* 20(10): 385-387.
- FL** Nikonorow, M. and Rozycka, D. studies on toxicity of phenylmercuric acetate (pma) in chickens. iii. studies on the levels of copper, zinc and cadmium in the liver and kidney of chickens exposed to repeated doses of pma. *Roczn. Panstw. Zakl. Hig.* 27(5): 569-575; 1976.(9 References)
- Unrel** Ninh, N. X., Maiter, D., Verniers, J., Lause, P., Ketelslegers, J. M., and Thissen, J. P. failure of exogenous igf-i to restore normal growth in rats submitted to dietary zinc deprivation. *J. Endocrinol.* (1998) 159(2): 211-217.
- IMM** Nishibori, T., Cooray, K., Xiong, H., Kawamura, I., Fujita, M., and Mitsuyama, M. 1995. correlation between the presence of virulence-associated genes as determined by pcr and actual virulence to mice in various strains of listeria spp. *Microbiology and Immunology* 39(5): 343-9.

- Mix** Nishida, Ikuo. effect of zinc and activated vitamin d3 on growth and development of rat 's condylar cartilage. *Kyushu Shika Gakkai Zasshi* (1998) 52(5): 585-602.
- BioX** Nishida Shinji(A), Fujita Taizo, Kohno Noriatsu, Atoda Hideko, Morita Takashi, Takeya Hiroyuki, Kido Isao, Paine Mark J L, Kawabata Shun-Ichiro, and Iwanaga Sadaaki(A). 1995. cdna cloning and deduced amino acid sequence of prothrombin activator (ecarin) from kenyan echis carinatus venom. *Biochemistry* 34(5): 1771-1779.
- CP** Nishikawa A(A), Shiokawa, D., and Tanuma, S. 1995. changes of endonuclease activity in liver during metamorphosis of xenopus laevis. *Zoological Science (Tokyo)* 12(SUPPL.): 91.
- Bio Acc** Nishimura, Hisao, Nishimura, Noriko, and Tohyama, Chiharu. localization of metallothionein in the genital organs of the male rat. *J. Histochem. Cytochem.* (1990) 38(7): 927-33 .
- Unrel** Nishimura, N., Nishimura, H., Ghaffar, A., and Tohyama, C. 1992. localization of metallothionein in the brain of rat and mouse. *Journal of Histochemistry and Cytochemistry* 40(2): 309-15.
- Abstract** Nishimura, Y., Inaba, J., and Ichikawa, R. metabolism of zinc-65 in juvenile rats 2. intestinal absorption and whole body retention. 23RD ANNUAL MEETING OF THE JAPAN RADIATION RESEARCH SOCIETY, NAGASAKI, JAPAN, OCT. 10-12, 1980. *J RADIAT RES.* 22 (1). 1981. 68.
- Phys** Nistico, G., Ciriolo, M. R., Fiskin, K., Iannone, M., De Martino, A., and Rotilio, G. 1992. ngf restores decrease in catalase activity and increases superoxide dismutase and glutathione peroxidase activity in the brain of aged rats. *Free Radical Biology & Medicine* 12(3): 177-81.
- No COC** Nixon, G. A., Buehler, E. V., and Niewenhuis, R. J. two-year rat feeding study with trisodium nitrilotriacetate and its calcium chelate. *Toxicol. Appl. Pharmacol.* (1972) 21(2): 244-52.
- FL** Nizza, A., Piccolo, V., Borriello, G., Colella, C., Pizzuti, G. P., and D'Angelo, A. effect of diets with different levels of fiber and zeolite on some hematologic values of rabbits. *Boll. - Soc. Ital. Biol. Sper.* (1987) 63(6): 459-63.
- FL** Nizza, A., Piccolo, V., Borriello, G., Colella, C., Pizzuti, G. P., and D'angelo, A. effects of diets with different levels of fibers and zeolite on some hematic values of rabbit. *BOLL SOC ITAL BIOL SPER. Bollettino Della Societa Italiana Di Biologia Sperimentale.* 63 (6). 1987. 459-465.
- No Dose** Nmezi, Dike Iherigbo. 1997. effects of dietary fiber and phytate in sugar beet fiber on skeletal levels of iron and zinc in rats. Avail.: UMI. Order No. DA9804140 From: Diss. Abstr. Int., B 1998, 58. 8. 4152. 93 pp.
- Nut def** Nobili, Fabio, Vignolini, Francesco, Figus, Elisabetta, and Mengheri, Elena. treatment of rats with dexamethasone or thyroxine reverses zinc deficiency-induced intestinal damage. *J. Nutr.* (1997) 127(9): 1807-1813.
- No Org** Nocek, Judith M., Stemp, Eric D. A., Finnegan, Michael G., Koshy, Thomas I., Johnson, Michael K., Margoliash, E., Mauk, A. Grant, Smith, Michael, and Hoffman, Brian M. low-temperature, cooperative conformational transition within [zn-cytochrome c peroxidase, cytochrome c] complexes: variation with cytochrome. *J. Am. Chem. Soc.* (1991) 113(18): 6822-31 .
- Mineral** Nockels, C. F. 1990. mineral alterations associated with stress, trauma, and infection and the effect on immunity. *Compendium on Continuing Education for the Practicing Veterinarian* 12(8): 1133-1139.

- Nut def** Nockels, C. F., Engle, T. E., Kimberling, C. V., Weaver, D. L., and Johnson, A. B. 1996. marginal zinc deficiency affects the composition of gain of calves. *FASEB Journal* 10(3): A514.
- IMM** Nockels Cheryl F. 1996. antioxidants improve cattle immunity following stress. *Animal Feed Science and Technology* 62(1): 59-68.
- No Oral** Noda, K. the effect of cadmium chloride and zinc chloride on dunn osteosarcoma. *Journal of the Japanese Orthopaedic Association*. 64 (1). 1990. 70-75.
- Unrel** Noel-Jorand, M. C., Colomb, E., Astier, J. P., and Sarles, H. 1981. pancreatic basal secretion in alcohol-fed and normal dogs. *Digestive Diseases and Sciences* 26(9): 783-789.
- CP** Noh, S. K. and Koo, S. I. 1998. feeding of a marginally low level of dietary zinc lowers the concentrations of alpha-tocopherol (alphatp) in selected organs. *FASEB Journal* 12(4): A217.
- Drug** NOLEN, G. A. reproduction and teratology studies of topically applied materials: zinc pyrithione. *CUTANEOUS TOXIC (PAP CONF)* :109-125,1984
- No Oral** Nolen, G. A., Patrick, L. F., and Dierckman, T. A. 1975. a percutaneous teratology study of zinc pyrithione in rabbits. *Toxicology and Applied Pharmacology* 31(3): 430-3.
- QAC** Nomiyama, K., Nomiyama, H., Kikuchi, T., and Yotoriyama, M. 1987. tissue metal shifts by a single exposure to metals in rats. *Sangyo Ika Daigaku Zasshi* 9 Suppl: 95-110.
- FL** Nonaka Itoko(A), Toharmat Toto, Shimizu Masahiro, and Kume Shin-Ichi. 1997. effects of twinning on blood mineral composition of periparturient cows and newborn calves during summer. *Animal Science and Technology* 68(10): 987-992.
- CP** Nonchev, S., Maconochie, M., Vesque, C., Aparicio, S., Ariza-McNaughton, L., Manzanares, M., Maruthainar, K., Kuroiwa, A., Brenner, S., Charnay, P., and Krumlauf, R. 1996. the conserved role of krox-20 in directing hox gene expression during vertebrate hindbrain segmentation. *Proceedings of the National Academy of Sciences of the United States of*
- BioX** Noordin, M., Howell, J. McC., Dorling, P. R., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. the effect of zinc on copper and heliotrope poisoning in sheep. 279-282.
- FL** Nordmann, R. 1993. [free radicals, oxidative stress and antioxidant vitamins]. <original> radicaux libres, stress oxydatif et vitamines antioxydantes. *Comptes Rendus Des Seances De La Societe De Biologie Et De Ses Filiales*
- CP** Nordstrom, J. W., Kohrs, M. B., Howser, M., and Dowdy, R. P. 1978. effect of different levels of zinc and copper in the diet on their concentrations in hair of guinea pigs. *Federation Proceedings* 37(3): 894.
- Bio Acc** Norheim G and Borch Iohnsen B. 1990. chemical and morphological studies of liver from eider (somateria mollissima) in svalbard with special reference to the distribution of copper. *JOURNAL OF COMPARATIVE PATHOLOGY* 102. 127(4): 457-466, illustr.
- Nut def** Norii, Takafumi and Suzuki, Hiroo. 1990. effect of alkali treated soy protein diet on tissue zinc content and serum alkaline phosphatase activity in zinc-deficient rats. *Nippon Eiyo Shokuryo Gakkaishi* 43(4): 255-61.
- Nut def** Norii, Takafumi and Suzuki, Hiroo. effect of dietary protein levels on tissue zinc content and serum alkaline phosphatase activity in zinc-deficient rats. *Nippon Eiyo Shokuryo Gakkaishi*

(1990): 43(4), 247-53.

- Nut** Norii, Takafumi and Suzuki, Hiroo. 1991. effects of amino acid supplementation on the growth and zinc requirement of rats fed alkali-treated soy protein. *Nippon Eiyo Shokuryo Gakkaishi* 44(2): 113-22.
- Nut def** Norii, Takafumi and Suzuki, Hiroo. 1995. selective ingestion of dietary protein level in zinc-deficient rats. *Nippon Eiyo Shokuryo Gakkaishi* 48(1): 49-56 .
- Drug** Norman, John N., Rahmat, Assadulah, and Smith, George. effect of supplements of zinc salts on the healing of granulating wounds in the rat and guinea pig. *J. Nutr.* (1975) 105(7): 815-21 .
- QAC** Norman, John N., Rahmat, Assadulah, and Smith, George. 1975. effect of supplements of zinc salts on the healing of incised wounds in the rat and guinea pig. *J. Nutr.* 105(7): 822-6 .
- Nut def** Norrdin, R. W., Krook, L., Pond, W. G., and Walker, E. F. 1973. experimental zinc deficiency in weanling pigs on high and low calcium diets. *Cornell Veterinarian* 63(2): 264-290.
- Nut** Norton, B. W., Hales, J. W., and Stockwell, T. G. H. reproduction growth and survival of merino ewes and lambs in south-western queensland australia and their response to trace element supplementation. *Australian Journal of Experimental Agriculture.* 30 (2). 1990. 155-164.
- No Tox** Norton, Derek Stanley and Heaton, Frank William. distribution of copper and zinc among protein fractions in the cytoplasm of rat tissues. *J. Inorg. Biochem.* (1980) 13(1): 1-9
- CP** Norvell, M. J., Gable, D. A., and Thomas, M. C. 1976. effects of feeding high levels of various copper salts to broiler chickens. 457-464.
- FL** Nosenko, N. and Pod"yablonskii, S. 1996. premixes based on zeolites for young fattening (pigs). *Svinovodstvo (Moskva)* (5): 4-5.
- CP** NOSEWORTHY, M. D., TABATABAIE, T., FLOYD, R. A., and BRAY, T. M. 1995. detection of brain and lung oxidative stress in zinc and protein deficient rats following hyperoxia exposure. *EXPERIMENTAL BIOLOGY* 95
- No COC** Jones, R. J., Blunt, C. G. , and Nurnberg, B. I. 1978. toxicity of leucaena leucocephala. the effect of iodine and mineral supplements on penned steers fed a sole diet of leucaena. *Australian Veterinary Journal* 54(8): 387-392.
- Unrel** Nourollahi, M. and Meryon, S. D. 1989. the antibacterial properties of four elements released from dental restorative materials. *International Endodontic Journal* 22(1): 9-16.
- FL** Novakova, S., Nikolchev, G., Angelieva, R., and Dinova, S. combined effect of cadmium and zinc in experimental atherosclerosis. *Khig. Zdraveopaz.* (1982) 25(5): 448-54.
- No Oral** Novelli, E. L., Novelli Filho, J. L., Rodrigues, N. L., and Ribas, B. O. 1994. increased oxygen radical and high-dietary-carbohydrate pancreatic damage. *Boletin De Estudios Medicos y Biologicos* 42(1-4): 21-5.
- Unrel** Novelli, E. L. B(A), Rodrigues, N. L., Franca, E. L., Gebra, L. M. M., and Ribas, B. O. 1993. high dietary carbohydrate and pancreatic lesion. *Brazilian Journal of Medical and Biological Research* 26(1): 31-36.
- Unrel** Novelli Ethel L B, Rodrigues, N. L., and Chiacchio, S. B. 1993. clinical biochemical

determinations in the mangalarga-paulista hors: reference values. *Acta Veterinaria Hungarica* 41(1-2): 151-158.

- Drug** Novelli Ethel L B(A), Rodrigues Ney L, Santos Celio X C, Martinez Francisco E, and Novelli Jose Luiz V B. 1997. toxic effects of alcohol intake on prostate of rats. *Prostate* 31(1): 37-41.
- Nut def** Novikova, E. P., Stolmakova, A. I., Boris, Ya. G., Plastunov, V. A., and Kuziv, R. S. effect of zinc, iron, and cobalt on excretion of water-soluble vitamins and enzyme activity during unbalanced nutrition. *Mikroelem. Med. (1974)* : 5, 109-14.
- No Oral** Nowell, N. W., Thody, A. J., and Woodley, R. alpha melanocyte stimulating hormone and aggressive behavior in the male mouse. *Physiology & Behavior*. 24 (1). 1980. 5-10.
- Carcin** Numan, M., Numan, M. J., Marzella, S. R., and Palumbo, A. 1998. expression of c-fos, fos b, and egr-1 in the medial preoptic area and bed nucleus of the stria terminalis during maternal behavior in rats. *Brain Research* 792(2): 348-52.
- CP** Nunzi, M. G., Polato, P., Petrelli, L., Zanotti, A., and Guidolin, D. effect of phosphatidylserine administration on morpho-functional markers of brain aging in the rat. *THIRD INTERNATIONAL CONFERENCE ON ALZHEIMER'S DISEASE AND RELATED DISORDERS, ABANO TERME, ITALY, JULY 12-17, 1992. NEUROBIOL AGING*. 13 (Suppl. 1). 1992. S122.
- CP** Nuorteva, P. and <Editors> Elberg, K. 1999. levels of cadmium and some other metals in insects. <. *Document Title>Proceedings of the XXIV Nordic Congress of Entomology, August 8-11, 1997, Tartu, Estonia*. 125-137.
- FL** Nussara Vadhanakul, Kalaya Mitpaiboon, and Panpilai Seksit (Department of Livestock Development, Bangkok Thailand Artificial Insemination Div. 1983. study on the concentration of mineral elements affecting fertility in blood of fertile daily cows in ayudthaya province [thailand]. <original> kan sukxa pariman khong rhaethat nai luat thi mi phonto kan phasomtit nai khonom sombun phan nai changwat phanakon sri ayuthaya. proceeding of the 10th annual veterinary conference. <original> pramuan ruang prachum wichakan thang sattawaphaet khrang thi 10 prachampi 2526. P. 58-68
- Surv** Nyholm, Erik. 1986. uptake and effects of metals on birds and mammals in heavy metal contaminated areas. *Inst. Vatten- Luftvaardsforsk. [Publ.] B* IVL B 820, 50 pp..
- Surv** Nyholm, N. EI, Sawicka-Kapusta, K., Swiergosz, R., and Laczewska, B. 1995. effects of environmental pollution on breeding populations of birds in southern poland. *Water Air and Soil Pollution* . 85(2): 829-834.
- No Oral** Nystroem, A., Hallmans, G., and Lithner, F. 1984. zinc metabolism in long term alloxan diabetic rats after thermal trauma. *Acta Med. Scand. Suppl.* 687: (Diabetic Gangrene).
- Nut def** O'Dell, B. L. copper-zinc interaction. effect of excess dietary zinc on copper status. *Proc. N. Z. Workshop Trace Elem. N. Z. (1981)* 157-64. Editor: 157-64. Editor(s): Dunckley, Jim V. Publisher: Univ. Otago, Dep. Nutr., Dunedin, N. Z..
- Rev** O'Dell B L. 1969. effect of dietary components upon zinc availability. *AMER J CLIN NUTR.* 22(10): 1315-1322.
- Mineral** O'Dell, B. L. 1993. fructose and mineral metabolism. *The American Journal Of Clinical Nutrition*. 58(5S): 771S-778S.
- Nut def** O'Dell, B. L. 1993. roles of zinc and copper in the nervous system. *Progress in Clinical and*

- Bio Acc** O'Dell, B. L. 1968. trace elements in embryonic development mammals birds vitamin b-12 copper zinc iron. *FED PROC.* 27(1): 199-204.
- Nut def** O'Dell, B. L., Becker, J. K., Emery, M. P., and Browning, J. D. 1989. production and reversal of the neuromuscular pathology and related signs of zinc deficiency in guinea pigs. *The Journal Of Nutrition.* 119(2): 196-201.
- CP** O'dell, B. L. and Browning, J. D. zinc status and glutamate stimulation of calcium uptake by guinea-pig cortical synaptosomes. *75TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ATLANTA, GEORGIA, USA, APRIL 21-25, 1991. FASEB (FED AM SOC EXP BIOL) J.* 5 (5). 1991. A1079.
- CP** O'Dell, B. L., Browning, J. D., and Reeves, P. G. interaction of zinc and major nutrients in the stability of rat erythrocytes. *Trace Elements In Man And Animals : Tema 5 : Proceedings Of The Fifth International Symposium On Trace Elements In Man And Animals / Editors C.f. Mills, I. Bremner, & J.k. Chesters.* p. 75-79.
- Nut def** O'Dell, B. L., Browning, J. D., and Reeves, P. G. plasma levels of prostaglandin metabolites in zinc-deficient female rats near term. *J. Nutr.* (1983) 113(4): 760-5.
- Nut def** O'Dell, B. L., Browning, J. D., and Reeves, P. G. 1987. zinc deficiency increases the osmotic fragility of rat erythrocytes. *The Journal Of Nutrition.* 117(11): 1883-1889.
- Nut def** O'Dell, B. L., Burpo, C. E., and Savage, J. E. evaluation of zinc availability in foods of plant and animal origin. *J. Nutr.* (1972) 102(5): 653-60 .
- Nut def** O'Dell, B. L., Burpo, C. E., and Savage, J. E. 1972. evaluation of zinc availability in foodstuffs of plant and animal origin. *Journal of Nutrition* 102(5): 653-60.
- CP** O'Dell, B. L., Conley-Harrison, J., Browning, J. D., Besch-Williford, C., Hempe, J. M., and Savage, J. E. zinc deficiency and peripheral neuropathy in chicks. *Proc. Soc. Exp. Biol. Med.* (1990) 194(1): 1-4.
- Nut def** O'Dell, Boyd L., Becker, James K., Emery, Michelle P., and Browning, Jimmy D. 1989. production and reversal of the neuromuscular pathology and related signs of zinc deficiency in guinea pigs. *J. Nutr.* 119(2): 196-201 .
- CP** O'Dell, Boyd L., Browning, J. D., and Reeves, Philip G. 1985. interaction of zinc and major nutrients in the stability of rat erythrocytes. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th : Meeting Date 1984, 75-9.* Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK.
- Nut def** O'Dell, Boyd L. and Emery, Michelle. compromised zinc status in rats adversely affects calcium metabolism in platelets. *J. Nutr.* (1991) 121(11): 1763-8
- Nut def** O'Dell, Boyd L., Reeves, P. G., and Morgan, R. F. interrelations of tissue copper and zinc concentrations in rats nutritionally deficient in one or the other of these elements. *Trace Subst. Environ. Health* (1976) : 10, 411-21 .
- Nut def** O'Dell, Boyd L., Reynolds, Genevieve, and Reeves, Philip G. analogous effects of zinc deficiency and aspirin toxicity in the pregnant rat. *J. Nutr.* (1977) 107(7): 1222-8.
- Nut def** O'Leary, Mary J., McClain, C. J., and Hegarty, P. V. J. effect of zinc deficiency on the weight,

cellularity and zinc concentration of different skeletal muscles in the post-weanling rat. *The British Journal Of Nutrition*. Nov 1979. v. 42 (3) p. 487-495. ill., charts.

- No Oral** O'Neal, Robert M., Pla, Gwendolyn W., Fox, M. R. Spivey, Gibson, Faye S., and Fry, Bert E. Jr. effect of zinc deficiency and restricted feeding on protein and ribonucleic acid metabolism of rat brain. *J. Nutr.* (1970) 100(5): 491-7 .
- Nut def** O'Neil-Cutting, Mary A., Bomford, A., and Munro, H. N. effect of excess dietary zinc on tissue storage of iron in rats. *J. Nutr.* (1981) 111(11): 1969-79.
- Abstract** O'quinn, P. R., Bergstrom, J. R(A), Nelssen, J. L., Tokach, M. D., Dritz, S. S., and Goodband, R. D. 1997. the interactive effects between diet complexity, zinc oxide, and feed grade antibiotic on performance of segregated early weaned pigs. *Journal of Animal Science* 75(SUPPL. 1): 192.
- Meth** O'Rear, Charles E., Van't Riet, Bart, and Smith, M. J. Vernon. the development of a test system for inhibition of urinary oxalate lithiasis. *Invest. Urol.* (1978) 16(2): 163-5 .
- Abstract** O'sullivan, C., Flynn, A., and Cremin, F. M. the effect of dietary aluminum phosphate on zinc absorption in the rat. *14TH ANNUAL FOOD SCIENCE AND TECHNOLOGY RESEARCH CONFERENCE, CORK, IRELAND, SEPT. 5-7, 1984. IR J FOOD SCI TECHNOL.* 8 (2). 1984 (Recd. 1985). 138.
- Nut def** O'SULLIVAN, V. R., QUINN, B., CREMIN, F. M., and BOND, R. folate supplementation and teratogenesis in zinc deficient rat fetuses. *J DENT RES* 66:902,1987
- Prim** Obeck, D. K. 1978. *Galvanized Caging As a Factor in the Development of the 'Fading or 'White Monkey' Syndrome*. <NOTE> Final Rept : 9p.
- Prim** Obeck, Douglas K. galvanized caging as a potential factor in the development of the "fading infant" or "white monkey " syndrome. *Lab. Anim. Sci.* (1978) 28(6): 698-704.
- Phys** Oberbauer, A. M., Currier, T. A., Nancarrow, C. D., Ward, K. A., and Murray, J. D. 1992. linear bone growth of omt1a-ogh transgenic male mice. *American Journal of Physiology* 262(6 Pt 1): E936-42.
- CP** Oberbauer, A. M. and Murray, J. D. 1997. continuous and transient exposure to elevated gh in the mature omt1a-ogh transgenic mouse. *Journal of Animal Science* 75(SUPPL. 1): 164.
- CP** Oberleas, D. 1985. the effect of phytate on endogenous zinc and zinc homeostasis. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th* : Meeting Date 1984, 453-5. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK..
- Abstract** Oberleas, D., Caldwell, D. F., Clancy, J., and Prasad, A. S. effects of zinc nutrition on behavior in the rat. *CLIN RES. Clinical Research.* 17 (3). 1969 548
- Nut def** Oberleas, D., Caldwell, D. F., and Prasad, A. S. 1971. behavioral deficit with zinc deficiency. *Psychopharmacology Bulletin* 7(3): 35.
- Nut def** Oberleas, D., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. phytate:zinc interaction in the maintenance of zinc homeostasis. 630-633.
- No Oral** Oberleas, D. and Kwun, I. S. 1998. objective confirmation for the mechanism of zinc homeostasis. *Mengen- Spurenelem. Arbeitstag., 18th* : 289-293. Editor(s): Anke, Manfred. Publisher: Verlag Harald Schubert, Leipzig, Germany..

- No COC** Oberleas, D., Muhrer, M. E., and O'Dell, B. L. 1966. dietary metal-complexing agents and zinc availability in the rat. *Journal of Nutrition* 90(1): 56-62.
- CP** Oberleas, D. and Prasad, A. S. 1970. effect of zinc deficiency on growth and utilization of phytate-containing proteins. *Trace Elem. Metab. Anim. Proc. WAAP World Ass. Anim. Prod./IBP (Int. Biol. Progr.) Int. Symp.* Meeting Date 1969, 170-3. Editor(s): Mills, Colin F. Publisher: Livingstone, London, Engl..
- CP** Oberleas, D. and Prasad, A. S. effect of zinc on thymidine kinase activity and dna metabolism. *HOEKSTRA, W. G. ET AL. (ED.). TRACE ELEMENT METABOLISM IN ANIMALS, NO. 2. PROCEEDINGS OF THE SECOND INTERNATIONAL SYMPOSIUM. MADISON, WIS., U.S.A., JUNE 18-22, 1973. XXVI+775P. ILLUS. UNIVERSITY PARK PRESS: BALTIMORE, MD., U.S.A.; LONDON, ENGLAND. ISBN 0-8391-0696-3. 1974 730-732*
- Nut** Oberleas, D. and Prasad, A. S. growth as affected by zinc and protein nutrition. *Amer. J. Clin. Nutr.* (1969) 22(10): 1304-14 .
- Abstract** Oberleas, D. and Prasad, A. S. growth as an index of protein or zinc adequacy abstract rat soy-d casein. *FED PROC. Federation Proceedings.* 28 (2). 1969 691
- Nut def** Oberleas, D., Seymour, J. K., Lenaghan, R., Hovanesian, J., Wilson, R. F., and Prasad, A. S. 1971. effect of zinc deficiency on wound-healing in rats. *American Journal of Surgery* 121(5): 566-8.
- No COC** Oberleas, D. and Smith, J. C. Jr. phytate in zinc bioavailability and homeostasis. *Ber. Bundesforschungsanst. Ernaehr.* (1993) BFE-R-93-01, Bioavailability '93, Pt. 2, 185-9.
- No Oral** Oberleas, Donald. mechanism of zinc homeostasis. *J. Inorg. Biochem.* (1996) 62(4): 231-241.
- Phys** Oberleas, Donald and Kwun, In Sook. 1998. confirmation of the mechanism of zinc homeostasis. *Met. Ions Biol. Med. Proc. Int. Symp., 5th* : 140-145. Editor(s): Collery, Phillipe. Publisher: Libbey Eurotext, Montrouge, Fr..
- CP** Oberleas, Donald and Kwun, In-Sook. 1997. effect of phytate on endogenous zinc and fractionation of pancreatic/biliary (p/b) fluid in rats. *Trace Elem. Man Anim.--9 Proc. Int. Symp., 9th* : Meeting Date 1996, 19-21. Editor(s): Fischer, Peter W. F. Publisher: National Research Council of Canada, Ottawa, Ont..
- No Oral** Obiso, R. J. Jr., Lyerly, D. M., Van Tassell, R. L., and Wilkins, T. D. 1995. proteolytic activity of the bacteroides fragilis enterotoxin causes fluid secretion and intestinal damage in vivo. *Infection And Immunity.* 63(10): 3820-3826.
- CP** Oblender, M. and Carpentieri, U. growth ribonucleotide reductase and metals in murine leukemic lymphocytes. *THIRD INTERNATIONAL CONFERENCE OF ANTICANCER RESEARCH, MARATHON, GREECE, OCTOBER 16-20, 1990. ANTICANCER RES. 10 (5 Part B). 1990. 1392-1393.*
- CP** Obsioma, A. R., Roxas, N. P., Lapitan, R. M., and Momongan, V. G. 1994. investigation on carabao (bubalus bubalis) reproduction using clinical and radioimmunoassay techniques. <document title>strengthening research on animal reproduction and disease diagnosis in asia through the application of immunoassay techniques: proceedings of the final research co-ordination meeting, bangkok, thailand, 1-5 february 1993. 119-125.
- In Vit** Ochi, T. 1988. effects of glutathione depletion and induction of metallothioneins on the cytotoxicity of an organic hydroperoxide in cultured mammalian cells. *Toxicology* 50(3): 257-

- In Vit** Ochi, T., Otsuka, F., Takahashi, K., and Ohsawa, M. glutathione and metallothioneins as cellular defense against cadmium toxicity in cultured chinese hamster cells. *Chemico-Biological Interactions*. 65 (1). 1988. 1-14.
- No COC** Odunsi, A. A. and Onifade, A. A. 1998. effect of zinc bacitracin supplementation of broiler chick diets containing a low or high vegetable oil concentration in the tropics. *Tropical Veterinarian* 16(1-2): 51-57.
- Nut def** Odutuga, A. A. effects of low-zinc status and essential fatty acid deficiency on bone development and mineralization. *Comp. Biochem. Physiol. A* (1982) 71A(3): 383-8
- Nut def** Odutuga, A. A. effects of low-zinc status and essential fatty acid deficiency on growth and lipid composition of rat brain. *Clin. Exp. Pharmacol. Physiol.* (1982) 9(2): 213-21.
- Nut def** Odutuga, A. A., Adisa, A. O., and Obaleye, J. A. zinc and essential fatty acids modulate bone growth and metabolism in rats. *Biokemistri* (1997) 7(2): 99-105.
- FL** Odynets, R. N. 1980. zinc metabolism in sheep. *Mikroelementy v Zhivodnovodstve i Rastenievodstve, Frunze, USSR* (No 18): 82-99.
- CP** Oestreicher, P. and Cousins, R. J. 1983. analysis of copper-zinc antagonism at moderate dietary intakes using the isolated, vascularly perfused rat intestine. *Federation Proceedings* 42: 821.
- Abstract** Oestreicher, P. and Cousins, R. J. zinc transport by basolateral membrane vesicles from rat small intestine. *68TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 1-6, 1984 FED PROC.* 43 (4). 1984. Abstract 4646.
- Mix** Oestreicher, Paul and Cousins, Robert J. copper and zinc absorption in the rat : mechanism of mutual antagonism. *J. Nutr.* (1985) 115(2): 159-66 .
- Nut def** Oestreicher, Paul and Cousins, Robert J. zinc uptake by basolateral membrane vesicles from rat small intestine. *J. Nutr.* (1989) 119(4): 639-46 .
- FL** Oettel, M. and Kurischko, A. physiological endocrinological studies on the aggressive behavior in male mice *Zeitschrift Fuer Versuchstierkunde*. 20 (4). 1978. 186-193.
- FL** Oettel, M. and Kurischko, A. 1978. physiological-endocrinological studies on the aggressive behaviour in the male mouse. *Zeitschrift Fur Versuchstierkunde* 20(4): 186-193.
- CP** Oezpinar, H., Oezpinar, A., Ileri, K., Drochner, W., and Pallauf, J. ed. 1997. influence of different feeding during the dry period on some blood parameters and reproductive performance of dairy cattle. proceedings of the society of nutrition physiology. <original> berichte der gesellschaft fuer ernahrungsphysiologie. P. 122. No. 6
- Nut def** Oeztuerk, Gueler, Erbas, Deniz, Imir, Turgut, and Bor, Naci M. decreased natural killer (nk) cell activity in zinc-deficient rats. *Gen. Pharmacol.* (1994) 25(7): 1499-503.
- CP** Oflahert.ej. 1974. influence of dietary manganese and chromium of serum ceruloplasmin activity, copper and zinc in male rats. *Federation Proceedings* 33: 668.
- No COC** Ogata, Hiromitsu and Izumo, Yoshiro. effects of sublethal dose of gamma rays on the accumulation of zinc in mice fed the higher concentration diets. *Radioisotopes* (1990) 39(3):

102-5.

- FL** Ogawa, F. 1986. [experimental studies on indirect pulp capping]. *Shika Gakuho* 86(9): 1355-91.
- In Vit** Ogden, D. A., Zukoski, C. F., Cazee, C. R., and Chvapil, M. 1977. kinetics of the release of zinc and some enzymes from canine kidney during isolated perfusion. *Proceedings of the Society for Experimental Biology and Medicine*. 156(1): 46-51.
- Mix** OGDEN, L., EDWARDS, W. C., and NAIL, N. A. zinc intoxication in a dog from the ingestion of copper-clad zinc pennies. *VET HUM TOXICOL*; 30 (6). 1988. 577-578.
- In Vit** Ogiso, Taketo, Ogawa, Noriko, and Miura, Toshiaki. inhibitory effect of high dietary zinc on copper absorption in rats . ii. binding of copper and zinc to cytosol proteins in the intestinal mucosa. *Chem. Pharm. Bull.* (1979) 27(2): 515-21 .
- Phys** Ogra, Yasumitsu and Suzuki, Kazuo T. identification of non-acetylated metallothioneins induced in rat liver by zinc. *Res. Commun. Mol. Pathol. Pharmacol.* (1998) 102(2): 149-155.
- FL** Ogun, S. and Aksoy, T. 1991. effects of forced moulting on subsequent egg production and quality. *Doga Turk Veterinerlik Ve Hayvancilik Dergisi* 15(3): 338-348.
- Nut** Ogunmodede, B. K. dietary zinc and protein utilization by growing chickens. *Niger. J. Anim. Prod.* (1974) 1(2): 198-203 .
- Unrel** Oguntebi B(A), Clark, A., and Wilson, J. 1993. pulp capping with bioglass and autologous demineralized dentin in miniature swine. *Journal of Dental Research* 72(2): 484-489.
- No COC** Oguntona, T. 1988. studies on the response of guinea fowls (*numida meleagris*) to antibiotics. *British Poultry Science* 29(3): 683-7.
- Drug** Oguntona, T. and Zubair, A. K. 1988. response of guinea fowl (*numida meleagris*) to dietary supplementation of zinc bacitracin. *Poultry Science* 67(1): 145-148.
- Gene** Ogut, O. and Jin, J. P. 1998. developmentally regulated, alternative rna splicing-generated pectoral muscle-specific troponin t isoforms and role of the nh2-terminal hypervariable region in the tolerance to acidosis. *The Journal Of Biological Chemistry*. 273(43): 27858-27886.
- Gene** Ogut, O. and Jin, J. P. 1996. expression, zinc-affinity purification, and characterization of a novel metal-binding cluster in troponin t: metal-stabilized alpha-helical structure and effects of the nh2-terminal variable region on the conformation of intact troponin t and its association with tropomyosin. *Biochemistry* 35(51): 16581-90.
- Unrel** Ogut Ozgur and Jin Jian-Ping(A). 1996. expression, zinc-affinity purification, and characterization of a novel metal-binding cluster in troponin t: metal-stabilized alpha-helical structure and effects of the nh-2-terminal variable region on the conformation of intact troponin t and its association with tropomyosin. *Biochemistry* 35(51): 16581-16590.
- Phys** Oh-Ishi Shuji, Toshinai Koji, Kizaki Takako, Haga Shukoh, Fukuda Koichi, Nagata Naokazu, and Ohno Hideki(A). 1996. effects of aging and/or training on antioxidant enzyme system in diaphragm of mice. *Respiration Physiology* 105(3): 195-202.
- Fate** Oh, S. H., Deagen, J. T., Whanger, P. D., and Weswig, P. H. biological function of metallothionein. iv. biosynthesis and degradation of liver and kidney metallothionein in rats fed diets containing zinc or cadmium. *Bioinorg. Chem.* (1978) 8(3): 245-54 .

- No Oral** Ohanian, E. V. Schaechtelin G. Brown F. C. and Iwai J. acute effects of intra-arterial injections of cadmium, mercury and zinc on blood pressure and cardiovascular reactivity in dahl rats. *Proc.of Univ.of Missouri's 11th Annu.Conf.on Trace Substances in Environmental Health, Held at Memorial Union.*(1977): 272-279.
- Nut def** Ohara, I., Tabuchi, R., Kimura, M., and Itokawa, Y. 1995. decline of taste sensitivity in protein deficient adult rats. *Physiology & Behavior* 57(5): 921-926.
- No COC** Ohara, Ikuo, Tabuchi, Ritsuko, Kimura, Mieko, and Itokawa, Yoshinori. preference for sodium chloride is reduced in protein-deprived juvenile rats. *J. Nutr.* (1994) 124(6): 901-5 .
- No Oral** Ohara, Ikuo, Tabuchi, Ritsuko, and Onai, Kumiko. effects of modified rice bran on serum lipids and taste preference in streptozotocin-induced diabetic rats. *Nutr. Res. (N. Y.)* (1999) Volume Date 2000, 20(1): 59-68.
- No COC** Ohara Ikuo(A), Tabuchi Ritsuko, Kimura Mieko, and Itokawa Yoshinori. 1994. preference of sodium chloride is reduced in protein-deprived juvenile rats. *Journal of Nutrition* 124(6): 901-905.
- Gene** Ohashi, K., Toshima, J., Tajinda, K., Nakamura, T., and Mizuno, K. 1994. molecular cloning of a chicken lung cdna encoding a novel protein kinase with n-terminal two lim/double zinc finger motifs. *The Journal Of Biochemistry.* 116(3): 636-642.
- Drug** Ohe, O. and Arakawa, A. effect of feed additive antibiotics on chickens infected with eimeria-tenella. *Poultry Science.* 54 (4). 1975 1008-1018.
- FL** Ohkata, Kazuyoshi. effects of low calcium diet and cadmium addition on concentrations of cadmium, zinc, and copper in body tissues. *Nichidai Igaku Zasshi* (1972) 31(2): 105-24.
- FL** Ohki, M. turnover of taste bud cells in rats with taste disorder caused by zinc deficiency. *Nichidai Igaku Zasshi.* 49 (2). 1990. 189-200.
- Meth** Ohkubo, I., Huang, K., Ochiai, Y., Takagaki, M., and Kani, K. 1994. dipeptidyl peptidase iv from porcine seminal plasma: purification, characterization, and n-terminal amino acid sequence. *The Journal Of Biochemistry.* 116(5): 1182-1186.
- CP** Ohkubo Yasushi(A), Kishimoto Takeo, Nishida Eisuke, Gotoh Yukiko, and Endo Takeshi(A). 1992. expression and activity of cell cycle regulatory factors during skeletal muscle cell differentiation and dedifferentiation. *Cell Structure and Function* 17(6): 507.
- Nut def** Ohlen, B. and Scott, D. W. 1986. zinc-responsive dermatitis in puppies. *Canine Practice* 13(2): 6-10.
- Gene** Ohmachi, T., Fukuoka, R., Kimura, Y., Asada, Y., and Ennis, H. L. 1998. the characterization of two dictyostelium discoideum genes encoding ribosomal proteins with sequence similarity to rat l27a and l37a. *Bioscience, Biotechnology, and Biochemistry* 62(10): 2008-15.
- No Oral** OHTA, H. and CHERIAN, M. G. gastrointestinal absorption of cadmium and metallothionein. *TOXICOL APPL PHARMACOL*; 107 (1). 1991. 63-72.
- Nut** Ohta, Hisayoshi and Cherian, M. George University of Western Ontario ON Canada. the influence of nutritional deficiencies on gastrointestinal uptake of. *Toxicol.* V97, N1-3, P71(10)
- No Oral** Ohta, Hisayoshi, Soewarno, Tasbeh, and Yoshikawa, Hiroshi. effect of chromium(iii) or chromium(vi) injection on metal distributions in rat livers. *Gifu Daigaku Igakubu Kiyo* (1980)

28(2): 205-10.

- FL** Ohta, Mitsuhiro, Cheuk, Gina, Thomas, Kevin A., Kamagata-Kiyoura, Yusuke, Wink, Carole S., Yazdani, Malektaj, Falster, Alexander U., Simmons, William B., and Nakamoto, Tetsuo. effects of caffeine on the bones of aged, ovariectomized rats. *Ann. Nutr. Metab.* (1999) 43(1): 52-59.
- Alt** Ohtake, Hideki, Hasegawa, Kaoru, and Koga, Mutsuyoshi. zinc-binding protein in the livers of neonatal, normal and partially hepatectomized rats. *Biochem. J.* (1978) 174(3): 999-1005 .
- CP** OISHI, S. 1986. age dependent testicular atrophy induced by di-2-ethylhexylphthalate morphology cell specific enzyme activities and zinc concentration. *FOURTH INTERNATIONAL CONGRESS OF TOXICOLOGY*
- No COC** Oishi, S. effects of di-2-ethylhexylphthalate on lipid composition of serum and testis in rats. *Toxicology Letters (Amsterdam)*. 23 (1). 1984. 67-72.
- Drug** Oishi, S. 1985. reversibility of testicular atrophy induced by di(2-ethylhexyl) phthalate in rats. *Environmental Research* 36(1): 160-9.
- Phys** Oishi, S. 1993. strain differences in susceptibility to di-2-ethylhexyl phthalate-induced testicular atrophy in mice. *Toxicology Letters* 66(1): 47-52.
- No COC** Oishi, S. 1986. testicular atrophy induced by di(2-ethylhexyl)phthalate: changes in histology, cell specific enzyme activities and zinc concentrations in rat testis. *Archives of Toxicology* 59(4): 290-5.
- No COC** Oishi, S. and Hiraga, K. 1980. effect of phthalic acid esters on mouse testes. *Toxicology Letters* 5(6): 413-6.
- No COC** Oishi, S. and Hiraga, K. 1980. effects of phthalic acid monoesters on mouse testes. *Toxicology Letters* 6(4-5): 239-42.
- No COC** Oishi, S. and Hiraga, K. 1980. testicular atrophy induced by phthalic acid esters: effect on testosterone and zinc concentrations. *TOXICOLOGY AND APPLIED PHARMACOLOGY* 53(1): 35-41.
- No COC** Oishi, S. and Hiraga, K. 1980. testicular atrophy induced by phthalic acid monoesters: effects of zinc and testosterone concentrations. *Toxicology* 15(3): 197-202.
- No COC** Oishi, Shinshi. 1986. testicular atrophy induced by di(2-ethylhexyl) phthalate: changes in histology , cell-specific enzyme activities and zinc concentrations in rat testis. *Arch. Toxicol.* 59(4): 290-5 .
- No COC** Oishi, Shinshi. testicular atrophy of rats induced by di-2-ethylhexyl phthalate: effects of vitamin a and zinc concentrations in the testis, liver and serum. *Toxicol. Lett.* (1984) 20(1): 75-8 .
- Mix** Oishi, Shinshi and Hiraga, Kogo. 1983. testicular atrophy induced by dietary di-2-ethylhexyl phthalate: effect of zinc supplement. *Kenkyu Nenpo - Tokyo-Toritsu Eisei Kenkyusho* (34): 384-7 .
- No Oral** Oishi, Shinshi and D. Hiraga. 1983. testicular atrophy induced by di-2-ethylhexyl phthalate: effect of zinc supplement. *Toxicology and Applied Pharmacology*. 70: 43-48.
- Urel** Okada, F., Yamaguchi, K., Ichihara, A., and Nakamura, T. 1989. one of two subunits of masking

protein in latent tgf-beta is a part of pro-tgf-beta. *FEBS Letters* 242(2): 240-4.

- No COC** Okada, Masato and Nakagawa, Hachiro. protein tyrosine kinase in rat brain: neonatal rat brain expresses two types of pp60c-src and a novel protein tyrosine kinase. *J. Biochem. (Tokyo)* (1988) 104(2): 297-305 .
- Meth** Okada, Tetsuji A, Takeda, Kazuki, and Kouyama, Tsutomu. 1998. highly selective separation of rhodopsin from bovine rod outer segment membranes using combination of divalent cation and alkyl(thio)glucoside. *Photochemistry and Photobiology* 67(5): 495-499.
- Nut def** Okamoto, Hiroh, Kikuchi, Takeo, Ohbori, Shoko, and Ishikawa, Kiyoko. 1983. effects of trace elements during total parenteral nutrition in rats . ii. effects of supplementation with iron, zinc, copper and iodine on their concentrations in several tissues of trace element-deficient rats. *Nippon Eiyo Shokuryo Gakkaishi* 36(6): 507-14.
- Unrel** Okamoto, T., Ramalho, A. C., and Marcantonio, E. re implantation of rats maxillary incisors after filling the pulp cavity histological study. *Revista Da Faculdade De Odontologia De Aracatuba*. 4 (1). 1975 137-145.
- Nut def** Okegbile, E. O., Odunuga, O., and Oyewo, A. 1998. effect of dietary zinc deficiency on alkaline phosphatase and nucleic acids in rats. *African Journal of Medicine and Medical Sciences* 27(3-4): 189-92.
- Nut** Okewole, E. A. 1998. studies on the effects of vitamin supplementation on the management of psoroptic mange in rabbits. *Nigerian Veterinary Journal* 19: 32-39.
- Drug** Okewole, E. A(A), Ogundipe, G. A. T., and Ayoola, M. O. 1999. a stabilizable progesterone-induced diabetes mellitus in a dachshund bitch: a case report. *Tropical Veterinarian* 17(3-4): 113-118.
- No COC** Oki, M., Ishitake, T., Ohkubo, A., and Matoba, T. 1989. frequency dependence of the suppressive effects of vibration on atherosclerosis in the rabbit. *Kurume Medical Journal* 36(4): 161-166.
- FL** Okolelova, T., Badaev, E., and Eremeeva, V. 1994. the preparation of vitamins (in diets for poultry). *Ptitssevodstvo* (6): 15-16.
- Org Met** Okoniewski Joseph C(A) and Novesky Elizabeth. 1993. bird poisonings with cyclodienes in suburbia: links to historic use on turf. *Journal of Wildlife Management* 57(3): 630-639.
- FL** Okonski, J. RNRDA, Lorek, P., Elzbieciak, Z., and Zarnowski, J. <translated> correlation between ca, zn and cu (calcium, zinc and copper) contents in diets and the growth rate of rats. zależność między zawartością wapnia, cynku i miedzi w paszy a wzrostem szczurow. *Roczniki Naukowe Zootechniki. ; Monografie I Rozprawy*. 1981. 1981. (19) p. 273-282. ill.
- No Oral** Okumura, K., Kikuchi, M., Matsui, H., Naruse, K., Shimizu, K., Toki, Y., Hashimoto, H., and Ito, T. 1995. abnormal arachidonate distribution in low-density lipoprotein and thoracic aorta in hyperinsulinemia. *Metabolism: Clinical and Experimental* 44(6): 806-11.
- IMM** Okutomi, T., Tanaka, T., Yui, S., Mikami, M., Yamazaki, M., Abe, S., and Yamaguchi, H. 1998. anti-candida activity of calprotectin in combination with neutrophils or lactoferrin. *Microbiology and Immunology* 42(11): 789-93.
- Nut def** Olafson, R. W. 1983. intestinal metallothionein: effect of parenteral and enteral zinc exposure on tissue levels of mice on controlled zinc diets. *Journal of Nutrition* 113(2): 268-75.

- Phys** Olafson, R. W. thymus metallothionein: regulation of zinc-thionein in the aging mouse. *Can. J. Biochem. Cell Biol.* (1985) 63(2): 91-5 .
- Nut def** Olafson, Robert W. intestinal metallothionein: effect of parenteral and enteral zinc exposure on tissue levels of mice on controlled zinc diets. *J. Nutr.* (1983) 113(2): 268-75 .
- Nut def** Olagunju, J. A., Osisami, O. A., and Keazor, A. O. comparative studies of iron and zinc distribution in selected tissues of normal and iron-deficient rats. *Biokemistri* (1995) Volume Date 1995, 5(1): 41-9.
- FL** Oledzka, R., Piasecka, E., and Brzdekiewicz, D. 1991. studies on the effect of thiuram and diets with different protein content on the excretion of mineral compounds in urine of rats. *Bromatologia i Chemia Toksykologiczna* 24(1): 27-33.
- FL** Oledzka, Regina, Piasecka, Elzbieta, and Brzdekiewicz, Dorota. effect of thiuram and diets with differentiated protein content on urine elimination of mineral components in rat. *Bromatol. Chem. Toksykol.* (1991) 24(1): 27-33.
- FL** Oledzka, Regina, Skrajnowska, Dorota, and Piasecka, Elzbieta. the influence of dietary protein on the balance of mineral elements in rats intoxicated with carbaryl and propoxur. *Bromatol. Chem. Toksykol.* (1992) 25(2): 163-9.
- Phys** Olejnicka, Beata T., Andersson, Arne, Tyrberg, Bjorn, Dalen, Helge, and Brunk, Ulf T. .beta.-cells, oxidative stress, lysosomal stability, and apoptotic/necrotic cell death. *Antioxid. Redox Signaling* (1999) 1(3): 305-315.
- Prim** Olin, Katherine L., Shigenaga, Mark K., Ames, Bruce N., Golub, Mari S., Gershwin, M. Eric, Hendrickx, Andrew G., and Keen, Carl L. maternal dietary zinc influences dna strand break and 8-hydroxy-2'-deoxyguanosine levels in infant rhesus monkey liver. *Proc. Soc. Exp. Biol. Med.* (1993) 203(4): 461-6.
- Nut def** Olin, Katherine L, Walter, Robert M, and Keen, Carl L. copper deficiency affects selenogluthathione peroxidase and selenodeiodinase activities and antioxidant defense in weanling rats. *Am. J. Clin. Nutr.* (1994) 59(3): 654-8.
- FL** Oliva, J. C., Castell, M., Queral, J., and Castellote, C. effect of chronic inflammation on copper and zinc metabolism. *Rev. Esp. Fisiol.* (1987) 43(1): 25-31.
- Unrel** Oliveira, D. C., Lia, R. C. C., and Benatti Neto C. the effect of calcium hydroxide pastes in pulpar capping of rat molars comparative histologic study. *Revista De Odontologia Da UNESP (Universidade Estadual Paulista).* 17 (1). 1988. 43-62.
- FL** Oliveira, M. E. A. de, Oliveira, B. L. de, Bertechini, A. G., and Oliveira, A. I. G. de. 1994. performance of laying hens of three commercial strains, subjected to various methods of restricted feeding during the prelaying period. *UNIMAR Ciencias* 3: 72-77.
- FL** Oliveira, R. M. de, Hossain, S. M., Oliveira, A. I. G. de, and Bertechini, A. G. 1996. methods of inducing moulting in commercial laying hens. *Ciencia e Agrotecnologia* 20(3): 394-400.
- Nut** Oliveira, S. P. de, Reyes, F. G. R., Sgarbieri, V. C., Areas, M. A., and Ramalho, A. C. 1991. nutritional attributes of a sweet corn fibrous residue. *Journal Of Agricultural And Food Chemistry.* 39(4): 740-743.
- Abstract** Oliver, J. W., Sachan, D. S., Applehans, F. M., and Su, P. K. thyroid zinc interactions in conversion deiodination of thyroxine to tri iodo thyronine in rat liver. *68TH ANNUAL*

MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 1-6, 1984 FED PROC. 43 (4). 1984. Abstract 3312.

- Nut def** Oliver, J. W., Sachan, D. S., Su, P., and Applehans, F. M. 1987. effects of zinc deficiency on thyroid function. *Drug-Nutrient Interactions* 5(2): 113-24.
- Nut def** Oliver, Jack W., Sachan, Dileep S., Su, Paul, and Applehans, Fred M. effects of zinc deficiency on thyroid function. *Drug-Nutr. Interact.* (1987) 5(2): 113-24.
- Unrel** Olsen, F. K., Austin, B. P., and Walia, H. 1994. osseous reaction to implanted zoe retrograde filling materials in the tibia of rats. *Journal of Endodontics* 20(8): 389-94.
- Mix** Olson, P. A. D. R. Brink D. T. Hickok M. P. Carlson N. R. Schneider G. H. Deutscher D. C. Adams D. J. Colburn and A. R. Johnson. 1999. effects of supplementation of organic and inorganic combinations of copper, cobalt, manganese and zinc above nutrient requirement levels on postpartum two-year-old cows. *Journal of Animal Science*. 77: 522-532.
- Aquatic** Olsson, P. E., Haux, C., and Forlin, L. 1987. variations in hepatic metallothionein, zinc and copper levels during an annual reproductive-cycle in rainbow-trout, *salmo-gairdneri*. *Fish Physiology And Biochemistry* 3(1): 39-47.
- Nut def** Om, A. S., Oden, B., and Chung, K. W. 1996. effects of zinc-deficiency on hepatic steroid metabolism and steroid receptor sites during pubertal development. *FASEB Journal* 10(3): A193.
- Nut def** Om, Ae-Son and Chung, Kyung-Won . dietary zinc deficiency alters 5.alpha.-reduction and aromatization of testosterone and androgen and estrogen receptors in rat liver. *J. Nutr.* (1996) 126(4): 842-8.
- No COC** Om, Ae-Son, Ko, Young-Su, and Chung, Kyung-Won. toxic effects of ethanol on hepatic structure and function in rats. *Res. Commun. Alcohol Subst. Abuse* (1999) Volume Date 1998, 19(1 & 2): 11-28.
- Unrel** Omofoma, Matthew A. and Hampton, Andrew P. cyanide recovery in a ccd merrill-crowe circuit: pilot testwork of a cyanisorb process at the nerco delamar silver mine. *Randol Gold Forum* (1992) : 359-65 Publisher: Randol Int., Golden , Colo..
- Nut def** Oncuer, A. clinical and biochemical findings in experimental zinc deficiency in chicks. *Turk. J. Nucl. Sci.* (1984) 11(2): 190-8.
- Nut def** Oner, G., Bhaumick, B., and Bala, R. M. 1984. effect of zinc deficiency on serum somatomedin levels and skeletal growth in young rats. *Endocrinology* 114(5): 1860-3 .
- Abstract** Oner, G., Bhaumick, B., and Bala, R. M. the effect of zinc on serum somatomedin levels. *ANNUAL MEETING OF THE CANADIAN SOCIETY FOR CLINICAL INVESTIGATION, QUEBEC CITY, CANADA, SEPT. 12-14, 1982. CLIN INVEST MED.* 5 (2-3). 1982. 15b.
- CP** Oner, G. and Bor, N. 1979. growth retardation related to zinc deficiency. *Bilim Kongr. Tip Arastirma Grubu Tebligleri Turk. Bilimsel Tek. Arastirma Kurumu*, 6th : Meeting Date 1977, 281-93 Publisher: Turk. Bilimsel Tek. Arastirma Kurumu, Ankara, Turk..
- Nut def** Oner, G., Bor, N. M., Onuk, E., and Oner, Z. N. the role of zinc in the development of gastric ulcers in rats. *European Journal of Pharmacology*. 70 (2). 1981. 241-244.
- Nut def** Oner, G., Bor, N. M., Onuk, E., and Oner, Z. N. the role of zinc ion in the development of

gastric ulcers in rats. *Eur. J. Pharmacol.* (1981) 70(2): 241-3.

- Nut def** Oner, Gulsen, Bor, Naci, and Arcasoy, A. preliminary report: zinc deficiency and growth retardation. *Doga* (1977) 1(8-9): 288-93.
- Nut def** Oner, Gulsen and Bor, Naci M. serum somatomedin-a activity and insulin levels in zinc deficiency. *Nutr. Rep. Int.* (1978) 18(6): 749-54.
- Nut def** Oner, Gulson, Bhaumick, B., and Bala, R. Marvin. effect of zinc deficiency on serum somatomedin levels and skeletal growth in young rats. *Endocrinology (Baltimore)* (1984) 114(5): 1860-3
- CP** Ong, T. J., Kemp, P. J., Macgregor, G. G., Olver, R. E., and Mcardle, H. J. 1994 . zinc uptake by type ii pneumocytes isolated from fetal guinea pig lung is a carrier-mediated process stimulated by arachidonic acid. *Journal of Physiology (Cambridge)* 480P (0): 63P-64P.
- Phys** Ong, T. J., Kemp, P. J., Olver, R. E., and Mcardle, H. J(A). 1995. characterization of zinc uptake and its regulation by arachidonic acid in fetal type ii pneumocytes. *American Journal of Physiology* 269(1 PART 1): L71-L77.
- CP** ONIFADE, A. A., BABATUNDE, G. M., ADEMOLA, S. G., ODU, O., ADEJUMO, D. O., ODUNSI, A. A., OLUTUNDE, T. O., and SANNNI-AWAL, A. 1999. synergistic efficacy of a mixture of three growth-promoting additives in a high-fiber diet fed to broiler chickens. *EIGHTY-EIGHTH ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION*
- Phys** Onishi, Y., Azuma, Y., Sato, Y., Mizuno, Y., Tadakuma, T., and Kizaki, H. 1993. topoisomerase inhibitors induce apoptosis in thymocytes. *Biochimica Et Biophysica Acta* 1175(2): 147-54.
- No Oral** Ono, S. I. Koropatnick D. J. and Cherian M. G. 1997. regional brain distribution of metallothionein, zinc and copper in toxic milk mutant and transgenic mice. *Toxicology.* 124(1): 1-10.
- Alt** Ono, Shin-Ichi and Cherian, M. George. changes in brain metallothionein and zinc during development in transgenic mice. *Biol. Trace Elem. Res.* (1998) 61(1): 41-49.
- No Oral** Onosaka, S. and Cherian, M. G. 1982. the induced synthesis of metallothionein in various tissues of rats in response to metals. ii. influence of zinc status and specific effect on pancreatic metallothionein. *Toxicology* 23(1): 11-20.
- No Oral** Onosaka, S., Kawakami, D., Min, K. S., Oo-Ishi, K., and Tanaka, K. 1987. induced synthesis of metallothionein by ascorbic acid in mouse liver. *Toxicology* 43(3): 251-9.
- No Oral** Onosaka, Satomi and Cherian, M. George. the induced synthesis of metallothionein in various tissues of rats in response to metals. ii. influence of zinc status and specific effect on pancreatic metallothionein. *Toxicology (1982)* 23(1): 11-20.
- In Vit** Onosaka, Satomi, Min, Kyong Son, Fujita, Yuki, Tanaka, Keiichi, Iguchi, Shin, and Okada, Yoshio. high concentration of pancreatic metallothionein in normal mice. *Toxicology (1988)* 50(1): 27-35
- Gene** Oosterwegel, M., Timmerman, J., Leiden, J., and Clevers, H. 1992. expression of gata-3 during lymphocyte differentiation and mouse embryogenesis. *Developmental Immunology* 3(1): 1-11.
- Org Met** Orecchio, F., Togna, G., Di Battista, L., Villa, P., and Ficarra, M. G. biological effects of dithiocarbamates: zinc ethylenebis dithiocarbamate and parathion and paraoxon acute toxicity in

mice. *Ig. Mod.* 72(3): 305-310 1979 (11 References)

- Nut def** Oresnik, A. 1996. zinc in the nutrition of dairy cows. *Sodobno Kmetijstvo* 29(5): 221-224.
- FL** Oresnik, A. Ljubljana Univ. Slovenia Biotechnical Fac. Zootechnical Dept. 1996. zinc in dairy cattle nutrition. <original> cink v prehrani krav molznic. *Sodobno Kmetijstvo*. V. 29(5) P. 221-224
- Nut def** Orgebin-Crist, Marie C., Freeman, M., and Barney, G. H. 1971. sperm formation in zinc-deficient rats. *Ann. Biol. Anim. Biochim., Biophys.* 11(4): 547-58.
- BioX** Orimo, H., Onda, K., Kaseki, H., Kanda, Y., Hisayasu, S., Hirai, Y., and Yoshino, Y. 1984. the chronic intoxication test on germanium contained spirulina productfed to wistar strain rats. *Japanese Journal of Nutrition* 42(1): 43-49.
- Abstract** ORTEGA-S, J. A., MCDOWELL, L. R., GONZALEZ-P, M. A., DE, L. O. S. SANTOS-V D, and ROMAN-P, H. 1991. mineral status of cattle in three regions of northeast mexico. 83RD ANNUAL MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE J ANIM SCI. 69(Suppl. 1): 555.
- Drug** Osaki, H., Saito, H., Yagyu, M., and Furuya, M. 1975. vaginal levels of oral tinidazole in rats and oral single-dose treatment of trichomoniasis with tinidazole in man and mice. *Japanese Journal of Parasitology* 24(1): 16-23.
- Nut def** Osati-Ashtiani, F., King, L. E., and Fraker, P. J. variance in the resistance of murine early bone marrow b cells to a deficiency in zinc. *Immunology (1998)* 94(1): 94-100
- Nut def** Osati-Ashtiani, Farzaneh. 1996. perturbation of lymphopoiesis by dietary zinc deficiency in young adult a/j mice (b cells, t cells, glucocorticoids). Avail.: UMI. Order No. DA9718874 From: Diss. Abstr. Int., B 1997, 58. 279 pp.
- Bio Acc** Osborn, D., Harris, M. P., and Nicholson, J. K. comparative tissue distribution of mercury, cadmium, and zinc in three species of pelagic seabirds. *Comp. Biochem. Physiol. C (1979)* 64C(1): 61-7.
- CP** Osborn, Daniel. 1979. the significance of metal residues in wild animals. *Manage. Control Heavy Met. Environ. Int. Conf.* 187-90 Publisher: CEP Consultants Ltd., Edinburgh, Scot.
- No COC** Osborne, M. T. and Soares, J. H. the effect of ovarian status, form of vitamin d3 steroid and calcium supplementation on bone metabolism in the rat and the quail. *Nutr. Res. (N. Y.) (1990)* 19(8): 887-901.
- OAC** Osipov, A. N., Sypin, V. D., and Kolomijtseva, G. Ya. dna-protein cross-links in different organs of mice induced by the combined action of zinc and .gamma.-irradiation. *Biochemistry (Moscow) (1999)* 64(2): 201-203.
- FL** Osipov, A. P. and Matiash, B. L. 1987. [prevention of the toxic action of carbon disulfide on the oral mucosa of experimental animals]. <original> profilaktika toksicheskogo vozdeistviia serougleroda na slizistuiu obolochku polosti rta eksperimental'nykh zhivotnykh. *Stomatologiya* 66(3): 17-20.
- No Dose** Osman, A. A., Rahim, A. G. A., Gameel, A. A., and Bushara, H. O. 1984. the relationship between serum copper and zinc concentrations and the activities of the serum enzymes copper oxidase (caeruloplasmin) and alkaline phosphatase in sheep infected with schistosoma bovis and fed on different levels of nutrition. *World Review of Animal Production* 20(2): 3, 33-37.

- Biom** Osuka, K., Suzuki, Y., Watanabe, Y., Dogan, A., Takayasu, M., Shibuya, M., and Yoshida, J. 1997. vasodilator effects on canine basilar artery induced by intracisternal interleukin-1 beta. *Vol. 17, No. 12, Pp. 1337-1345 J. Cereb. Blood Flow Metab.*
- In Vit** Ota Kosuke, Stetler-Stevenson William G, Yang Qiwei, Kumar Anil, Wada Jun, Kashihara Naoki, Wallner Elisabeth I, and Kanwar Yashpal S. 1998. cloning of murine membrane-type-1-matrix metalloproteinase (mt-1-mmp) and its metanephric developmental regulation with respect to mmp-2 and its inhibitor. *Kidney International* 54(1): 131-142.
- Nut def** Oteiza, P. I., Adonaylo, V. N., and Keen, C. L. cadmium-induced testes oxidative damage in rats can be influenced by dietary zinc intake. *Toxicology (1999)* 137(1): 13-22
- Nut def** Oteiza, Patricia I., Hurley, Lucille S., Lonnerdal, Bo, and Keen, Carl L. effects of marginal zinc deficiency on microtubule polymerization in the developing rat brain. *Biol. Trace Elem. Res. (1990)* 24(1): 13-23.
- Nut def** Oteiza, Patricia I., Olin, Katherine L., Fraga, Cesar G., and Keen, Carl L. zinc deficiency causes oxidative damage to proteins, lipids and dna in rat testes. *J. Nutr. (1995)* 125(4): 823-9.
- Nut** Ott, E. A. and Asquith, R. L. 1994. trace mineral supplementation of broodmares. *Journal of Equine Veterinary Science* 14(2): 93-101.
- No Control** Ott, EA, Smith, WH, Harrington, RB, and Beeson, WM. 1966. zinc toxicity in ruminants. ii. effect of high levels of dietary zinc on gains, feed consumption and feed efficiency of beef cattle. *J. Anim. Sci.* 25: 419.
- Nut def** Otto, H. F. and Weitz, H. 1972. electron microscope studies on paneth cells in rats on zinc-deficient diet. *Beitrage Zur Pathologie* 145(4): 336-349.
- Nut def** Otto, H. F. and Weitz, H. 1972. [electron microscopy studies of paneth cells in rats fed with zinc deficient diet]. <original> elektronenmikroskopische untersuchungen an paneth-zellen der ratte unter zinkarmer diat. *Beitrage Zur Pathologie* 145(4): 336-49.
- Nut def** Otto, H. F. and Wietz, H. electron microscope investigations on paneth cells in the rat on zinc deficient diet. *Beitraege Zur Pathologie.* 145 (4). 1972 336-349.
- Nut def** Otto, Herwart F. and Weitz, Hanfried. electron microscope investigations on paneth cells in the rat under a zinc-deficient diet. *Beitr. Pathol. (1972)* 145(4): 336-49.
- CP** Ou, J. I., Sridhar, K. J., Lee, C. S., Stevenson, D. K., and Dennery, P. A. 1997 . does metalloporphyrin mediated ho-1 induction result from oxidative stress in cultured hamster fibroblasts? *Pediatric Research* 41(4 PART 2): 169A.
- Mix** Ouellette, Andre J., Aviles, Louis, Burnweit, Cathy A., Frederick, Dana, and Malt, Ronald A. metallothionein mrna induction in mouse small bowel by oral cadmium and zinc. *Am. J. Physiol. (1982)* 243(5): G396-G403 .
- Diss** OUELLETTE, M. D. effect of alcohol ingestion on zinc status and pregnancy outcome in rats. *DISS ABSTR INT B* 46:801,1985
- Prim** Ovadia, J., McArthur, J. W., Kopito, L., and Ulfelder, H. 1971. the cervical mucus secretion of the bonnet monkey (m. radiata): anatomical basis and physiological regulation. *Biology of Reproduction* 5(2): 127-45.
- Nut** Owen, A. A., Peo, E. R. Jr., Cunningham, P. J., and Moser, B. D. 1973. effect of edta on

utilization of dietary zinc by g-f swine. *Journal of Animal Science* 37(2): 470-478 .

- Mix** Owen, Linda M. W., Crews, Helen M., Bishop, Nicholas J., and Massey, Robert C. study of copper, zinc and aluminum in the gut contents of guinea pigs using size exclusion chromatography-inductively coupled plasma mass spectrometry. *Ber. Bundesforschungsanst. Ernähr. (1993) (BFE-R-93-01, Bioavailability '93 Pt. 1)* : 284-8.
- Meth** Owen, Linda M. W., Crews, Helen M., Hutton, Robert C., and Walsh, Amanda. preliminary study of metals in proteins by high-performance liquid chromatography-inductively coupled plasma mass spectrometry using multi-element time-resolved analysis. *Analyst (London) (1992)* 117(3): 649-55.
- Phys** Owens, G. P., Hahn, W. E., and Cohen, J. J. identification of messenger rnas associated with programmed cell death in immature thymocytes. *Molecular and Cellular Biology.* 11 (8). 1991. 4177-4188.
- Abstract** OWSIANY, C. S., REBER, E. F., and ROSS, D. H. 1985. symptoms of zinc deficiency associated with excess aluminum intake. *69TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY*
- CP** Oyewo, E. A. and Dascombe, M. J. 1986. malaria (plasmodium berghei) in rats : effects on body temperature and response to salicylate therapy. *Homeostasis Therm. Stress Int. Symp. Pharmacol. Thermoregul., 6th* : Meeting Date 1985, 92-5. Editor(s): Cooper, Keith Edward. Publisher: Karger, Basel, Switz..
- Rev** Oyler, J. A. and <Editors> Bell, J. M. 1990. remediation of metals-contaminated site near a smelter using sludge/flyash amendments. 75-82.
- Sludge** Oyler, John A. remediation of metals - contaminated site near a zinc smelter using sludge/fly ash amendments: herbaceous species. *Trace Subst. Environ. Health (1989)* : 22, 306-20.
- In Vit** Ozawa, K., Sato, A., and Sasaki, T. effects of cadmium on cells cultured from rabbit tooth pulp and rat calvaria. *Folia Pharmacologica Japonica.* 69 (6). 1973 (Recd 1974) 314p
- Nut def** Ozkul, Yusuf, Dursun, Nurcan, Erenmemisoglu, Aydin, Suer, Cem, and Saatci, Cetin. effect of zinc deficiency on chromosomal abnormalities in mice . *Tohoku J. Exp. Med. (1996)* 179(4): 247-251.
- FL** Ozpinar, H., Ozpinar, A., Ileri, K., Kahraman, R., and Akin, G. 1995. influence of different feeding during the dry period on some bloodparameters and reproductive performance of dairy cattle. *Wiener Tierarztliche Monatsschrift* 82(2): 35-39.
- No COC** Oztas, B., Kucuk, M., and Sandalci, U. 1985. effect of insulin-induced hypoglycemia on blood-brain barrier permeability. *Experimental Neurology* 87(1): 129-36.
- Phys** Paci, M., Desideri, A., Sette, M., and Rotilio, G. nmr evidence for perturbation of the copper coordination sphere upon chemical modification of arginine 141 in bovine copper zinc superoxide dismutase. *Archives of Biochemistry and Biophysics.* 286 (1). 1991. 222-225.
- Nut def** Packman, S. 1987. regulation of copper metabolism in the mottled mouse. *Archives of Dermatology* 123(11): 1545-1547a.
- In Vit** Packman, S. and O'Toole, C. 1984. trace metal metabolism in cultured skin fibroblasts of the mottled mouse: response to metallothionein inducers. *Pediatric Research* 18(12): 1282-6.

- Gene** Padanilam, B. J. and Solursh, M. 1996. identification and localization of a novel zinc finger gene in developing chick skin and feather buds. *Biochemical and Biophysical Research Communications* 220(1): 63-7.
- Nut** Padron Herrera, M., Abreu Penate, M., Hernandez Triana, M., Symington Ferrer, R., and Reboso Perez, J. 1988. effect of wholemeal bread on mineral balance in rats. *Revista Cubana Alimentacion y Nutricion* 2(1): 120-135.
- Unrel** Pain, D. J., Sanchez, A., and Meharg, A. A. the donana ecological disaster: contamination of a world heritage estuarine marsh ecosystem with acidified pyrite mine waste. *Sci. Total Environ.* (1998) 222(1,2): 45-54.
- No COC** Pajovic, Snezana, Nikezic, Gordana, and Martinovic, Jovo V A. 1994. effects of ovarian hormones on superoxide dismutase activity in rat brain synaptosomes. *Neuroendocrinology Letters* 16(5-6): 291-296.
- FL** Pakhomov, Yu. N. effect of insufficient supply of trace elements (zinc and iron) to the body on its immunobiological reactivity. *Gig. Sanit. (1969)* 34(12): 33-5.
- In Vit** Paksy, Katalin, Varga, Bertalan, and Lazar, Peter. zinc protection against cadmium-induced infertility in female rats . effect of zinc and cadmium on the progesterone production of cultured granulosa cells. *BioMetals* (1997) 10(1): 27-35.
- Org Met** PAL, B. B. and BHUNYA, S. P. mutagenicity testing of a rodenticide, zinctox (zinc phosphide) in a mouse in vivo system. *IN VIVO (ATTIKI); 9 (1).* 1995. 81-83.
- Carcin** Palani, V., Senthilkumaran, R. K., and Govindasamy, S. 1999. biochemical evaluation of antitumor effect of muthu marunthu (a herbal formulation) on experimental fibrosarcoma in rats. *Journal of Ethnopharmacology* 65(3): 257-65.
- In Vit** Palida, Fakhruddin A., Mas, Alberto, Arola, Lluís, Bethin, Kathleen, Lonergan, Patricia A., and Ettinger, Murray J. cytosolic copper-binding proteins in rat and mouse hepatocytes incubated continuously with copper(ii). *Biochem. J. (1990)* 268(2): 359-66 .
- Nut** Pallaro, Anabel and Slobodianik, Nora. H. dietary protein quality and zinc levels in growing rats. *Nutr. Res. (N. Y.) (1999)* 19(7): 1089-1095 .
- FL** Pallauf. investigations on zinc depletion in the animal organism. *Zeitschrift Fuer Tierphysiologie Tierernaehrung Und Futtermittelkunde.* 29 (1). 1972 36-37
- Nut def** Pallauf, J. animal experimental studies on the zinc deficiency syndrome. *Aktuel. Ernaehrungsmed. Klin. Prax. (1983)* 8(3): 107-12.
- CP** Pallauf, J. 1978. effect of zinc deficiency on digestibility and utilization of nutrients. *Trace Elem. Metab. Man Anim. Proc. Int. Symp., 3rd : Meeting Date 1977*, 218-21. Editor(s): Kirchgessner, M. Publisher: Arbeitskreis Tierernaehrungsforschung Weihenstephan Inst. Ernaehrungsphysiol., Freising-Weihenstephan, Ger.
- FL** Pallauf, J. and Kirchgessner, M. 1973. concentration of zinc in rat hair during zinc depletion and repletion. suitability of hair as an indicator of the zinc supply. *Zentralblatt Fur Veterinarmedizin* 20A(2): 100-109.
- FL** Pallauf, J. and Kirchgessner, M. 1976. [effect of zinc deficiency on the digestibility and utilization of nutrients]. <original> einfluss mangelnder zinkversorgung auf verdaulichkeit und verwertung von nahrungstoffen. *Archiv Fur Tierernahrung* 26(7): 457-73.

- Nut def** Pallauf, J. and Kirchgessner, M. 1972. effectiveness of biotin and folacin supplements in zinc deficiency. *International Journal for Vitamin and Nutrition Research* 42(4): 555-564.
- Nut def** Pallauf, J. and Kirchgessner, M. effectiveness of biotin and folic acid additions during zinc deficiency. *Int. J. Vitam. Nutr. Res.* (1972) 42(4): 555-64.
- Abstract** Pallauf, J. and Kirchgessner, M. 1972. [effectiveness of biotin and folic acid supplementation in zinc deficiency]. <original> zur wirksamkeit von biotin- und folsaurezulagen bei zinkmangel. *International Journal for Vitamin and Nutrition Research* 42(4)
- Nut def** Pallauf, J. and Kirchgessner, M. 1973. the effectiveness of increased supplements of thiamin, riboflavin, vitamins b-6 and b-12, pantothenic acid and nicotinic acid in zinc deficiency. *International Journal for Vitamin and Nutrition Research* 43(3): 339-350.
- FL** Pallauf, J. and Kirchgessner, M. 1971. [experimental zinc deficiency in growing rats. 2. zinc metabolism in the animal organism]. <original> experimenteller zinkmangel bei wachsenden ratten. 2. zum stoffwechsel des zinks im tierischen organismus. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde*;
- FL** Pallauf, J. and Kirchgessner, M. 1972. metabolism of zinc in animals. 5. zinc content in bones and whole body of growing rats given different zinc supplies. *Zeitschrift Fur Tierphysiologie Tierernahrung Und Futtermittelkunde* 30(4): 193-202.
- FL** Pallauf, J. and Kirchgessner, M. 1971. metabolism of zinc in animals. ii. experimental zinc deficiency in growing rats. *Z. Tierphysiol. Tierernaehr. Futtermittelk.* 28(3): 128-39.
- FL** Pallauf, J. and Kirchgessner, M. 1972. zinc concentration in blood and serum of growing rats during zinc deficiency. *Zentralblatt Fur Veterinarmedizin* 19A(7): 594-604.
- FL** Pallauf, J. and Kirchgessner, M. 1973. zinc concentration in rat hair in zinc deficiency and excess. suitability of hair as an indicator of zinc distribution. *Zentralbl. Veterinaarmed. Reihe A* 20(2): 100-9
- FL** Pallauf, J. and Kirchgessner, M. 1972. zinc content in the bones and entire body of scrubbed rats provided with zinc supplements. 5. metabolism of zinc in animal organisms. *Z. Tierphysiol. Tierernaehr. Futtermittelk.* 30(4): 193-202
- FL** Pallauf, J. and Kirchgessner, M. zinc deficiency as affecting the digestibility and utilization of nutrients. *Arch. Tierernaehr.* (1976) 26(7): 457-73.
- FL** Pallauf, J. and Kirchgessner, M. 1972. zinc levels in blood and serum of growing rats with zinc deficiency. *Zentralbl. Veterinaarmed. Reihe A* 19(7): 594-604.
- FL** Pallauf, J. and Kirchgessner, M. the zinc requirement of adult rats. *International Journal for Vitamin and Nutrition Research.* 41 (4). 1971 543-553.
- Nut def** Pallauf, J. and Kirchgessner, M. zinc requirement of growing rats. *Int. J. Vitam. Nutr. Res.* (1971) 41(4): 543-53.
- FL** Pallauf, J. and Kirchgessner, M. 1971. [zinc requirements of growing rats]. <original> zum zinkbedarf wachsender ratten. *International Journal for Vitamin and Nutrition Research* 41(4)
- Nut** Pallauf, J., Kraemer, K., Markwitan, A., and Ebel, D. effect of citric acid supplementation on the bioavailability of zinc from corn germs. *Z. Ernaehrungswiss.* (1990) 29(1): 27-38 .

- Nut** Pallauf, J., Kramer, K., Markwitan, A., and Ebel, D. 1990. effect of a citric acid supplement on the bioavailability of zinc from maize germ. *Zeitschrift Fur Ernährungswissenschaft* 29(1): 27-38.
- FL** Pallauf, J., Kramer, K., Markwitan, A., and Ebel, D. 1990. [the effect of a supplement of citric acid on the bioavailability of zinc from corn germ]. <original> effekt einer zulage an citronensaure auf die bioverfuegbarkeit von zink aus maiskeimen. *Zeitschrift Fur Ernährungswissenschaft* 29(1): 27-38.
- FL** Pallauf, J., Rimbach, G., Pippig, S., Schindler, B., Hohler, D., and Most, E. 1994. dietary effect of phytogenic phytase and an addition of microbial phytase to a diet based on field beans, wheat, peas and barley on the utilization of phosphorus, calcium, magnesium, zinc and protein in piglets. *Zeitschrift Fur Ernährungswissenschaft* 33(2): 128-135.
- CP** Pallauf, J. and Schwarz, G. 1985. experimental studies on biochemical criteria of zinc deficiency in the rabbit. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th* : Meeting Date 1984, 587-90. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK..
- FL** Pallauf, J. Giessen Univ. Germany Inst. fuer Tierernaehrung, Rimbach, G., Pippig, S., Schindler, B., and Most, E. 1994. effect of phytase supplementation to a phytate-rich diet based on wheat, barley and soya on the bioavailability of dietary phosphorus, calcium, magnesium, zinc and protein in piglets. <original> effekt einer zulage an mikrobieller phytase zu einer phytatreichen diaet auf der basis von weizen, gerste und soja auf die bioverfuegbarkeit von phosphor, calcium, magnesium, zink und protein beim ferkel. *Agribiological Research*. V. 47(1) P. 39-48
- FL** Pallauff, J. and Kirchgessner, M. 1972. [znc levels in blood and serum of growing rats with zinc deficiency]. <original> zinkkonzentration in blut und serum wachsender ratten bei zinkmangel. *Zentralblatt Fur Veterinarmedizin. Reihe A* 19(7): 594-604.
- Nut def** Palludan, B. and Wegger, I. 1972. (zinc metabolism in pigs. iii. placental transfer of zinc in normal and zinc-deficient sows and its importance in the development of the foetuses). <Document Title> Aarsberetning. 27-53.
- In Vit** Palludan, B. and Wegger, I. zinc metabolism in pigs. xi. effects of zinc deficiency on the genital system of the boar. <Document Title> Arsberetning 1976. Institut for Sterilitetsforskning. A83-A96.
- Unrel** Palm, R., Wahlstrom, G., and Hallmans, G. 1990. age related changes in weight and the concentrations of zinc and copper in the brain of the adult rat. *Laboratory Animals* 24(3): 240-5.
- CP** Palma, E., Maggi, L., Miledi, R., and Eusebi, F. effects of zn^{2+} on wild and mutant neuronal α_7 nicotinic receptors. *Proc. Natl. Acad. Sci. U. S. A. (1998)* 95(17): 10246-10250.
- In Vit** Palmer, T. E. and Neet, K. E. subunit interactions in 7 s nerve growth factor gamma esterase activity as a probe of the dissociation of the 7s oligomer promoted by salt and edta. *Journal of Biological Chemistry*. 255 (11). 1980. 5170-5176.
- In Vit** Palmer, T. E. and Neet, K. E. subunit interactions of nerve growth factor sedimentation analysis of the dissociation of the 7s oligomer promoted by salt and edta. *Archives of Biochemistry and Biophysics*. 205 (2). 1980 (Recd. 1981). 412-421.
- HHE** Palmiter, R. D., Norstedt, G., Gelinas, R. E., Hammer, R. E., and Brinster, R. L. 1983. metallothionein-human gh fusion genes stimulate growth of mice. *Science, USA* 222(4625):

809-814.

- FL** Pan, Fan, Li, Sihan, Yan, Wanhua, Huang, Zuoneng, Ni, Shuhua, and Liu, Xuefeng. effects of dietary zinc and copper on rat serum lipids. *Yingyang Xuebao* (1996) 18(4): 427-433 .
- No Oral** Pandey, S. D. and Pandey, S. C. 1985. effect of intranasal irrigation with zinc-sulfate on male-induced estrus in the wild mouse, *mus-musculus-domesticus*. *Animal Reproduction Science* 8(3): 295-300.
- Unrel** Pandey, S. K. 1998. influence of himax on healing pattern of subcutaneous wounds:experimental and clinical studies. *Pashudhan* 13(6): 4.
- Mix** Panemangalore, M. and Bebe, F. N. 1996. effects of low oral lead and cadmium exposure and zinc status of heme metabolites in weanling rats. *Int J Occup Med Environ Health*. 9(2): 141-51.
- CP** Panemangalore, M. and Bebe, F. N. 1995. effects of varying dietary copper and zinc levels and subsequent copper supplementation on plasma and erythrocyte superoxide dismutase in weanling rats. *FASEB Journal* 9(4): A738.
- Abstract** Panemangalore, M. and Brady, F. O. the influence of zinc status on the synthesis and induction of metallo thionein in isolated perfused rat liver. *Federation Proceedings*. 38 (3 Part 1). 1979 605
- No Oral** Panemangalore, M. CBINA and Cherian, M. G. 1983. metabolism of parenterally administered zinc and cadmium in livers of newborn rats. *Chemico-Biological Interactions*. 45 (3): 327-339.
- No Dose** Panemangalore, Myna, Banerjee, Diponkar, Onosaka, Satomi, and Cherian, M. George. changes in the intracellular accumulation and distribution of metallothionein in rat liver and kidney during postnatal development. *Dev. Biol.* (1983) 97(1): 95-102 .
- Nut** Panemangalore, Myna and Bebe, Frederick N. effect of high dietary zinc on plasma ceruloplasmin and erythrocyte superoxide dismutase activities in copper-depleted and repleted rats. *Biol. Trace Elem. Res.* (1996). 55(1/2): 111-126.
- Nut def** Panemangalore, Myna and Brady, Frank O. the influence of zinc status on the levels of metallothionein in isolated perfused rat liver. *J. Nutr.* (1979) 109(11): 1825-35.
- Nut def** Pang, Zhi, Jiang, Jihua, Huang, Puzhao, Wang, Yuming, and Zheng, Jiaju. effects of zinc on natural killer cell activity in aged mice. *Yingyang Xuebao* (1993) 15(1): 102-5.
- Nut** Pantako, T. O., Passos, M., Desrosiers, T., and Amiot, J. effect of dietary milk proteins on time-dependent variations in plasma iron, magnesium, and zinc levels in aorta and portal vein in rats. *Lait* (1992) 72(6): 553-72.
- FL** Panteleeva, M. D. and Kononov, Yu. V. 1973. effect of added zinc in rations on assimilation of mineral substances by chickens. *Nauchn. Tr. Sib. Nauchno-Issled. Inst. Sel'Sk. Khoz.* 5: 188-90.
- FL** Panteleeva, M. D. and Polyakov, A. A. 1973. supplementing the feed of chicks with zinc sulfate. *Nauchn. Tr. Sib. Nauchno-Issled. Inst. Sel'Sk. Khoz.* 5: 197-9.
- In Vit** Panteva M(A), Varadinova T(A), and Turel, I. 1998. effect of copper acyclovir complexes on herpes simplex virus type 1 and type 2 (hsv-1, hsv-2) infection in cultured cells. *Metal-Based Drugs* 5(1): 19-23.

- In Vit** Pantoliano, M. W., Valentine, J. S., Mammone, R. J., and Scholler, D. M. pH dependence of metal ion binding to the native zinc site of bovine erythrocyte superoxide dismutase. *Journal of the American Chemical Society*. 104 (6). 1982. 1717-1723.
- Surv** Papasteriadis, A. 1973. zinc deficiency in ruminants in Greece. *Epistemonike Epeteris Kteniatrikes Sholes, Aristoteleion Panepistemon Thessalonikes* 14: 169-442.
- Diss** Papasteriadis, A. A. 1973. (study of zinc deficiencies in ruminants under Greek conditions). *Epistemonike Epeteris Kteniatrikes Skholes (Scientific Yearbook of the Veterinary Faculty), Thessaloniki* 14: 167-442.
- Unrel** Pappas, J. B., Nuttall, K. L., Ahlquist, J. T., Allen, E. M., and Banner, W. Jr. 1995. correction of previews 98416056. oral dimercaptosuccinic acid and ongoing exposure to lead: effects on heme synthesis and lead distribution in a rat model. addition of author name. erratum published in toxicology and applied pharmacology vol. 138. iss. 1. 1996. p. 192. *Toxicology and Applied Pharmacology* 133(1): 121-129.
- Biom** Pappas, J. B., Nuttall, K. L., Ahlquist, J. T., Allen, E. M., and Banner, W. Jr. 1995. oral dimercaptosuccinic acid and ongoing exposure to lead: effects on heme synthesis and lead distribution in a rat model [published erratum appears in toxicol appl pharmacol 1996 may;138(1):192]. *Toxicology and Applied Pharmacology* 133(1): 121-9.
- Drug** Pappolla, M. A(A), Chyan Y-J, Omar, R. A., Hsiao, K., Perry, G., Smith, M. A., and Bozner, P. 1998. evidence of oxidative stress and in vivo neurotoxicity of beta-amyloid in a transgenic mouse model of Alzheimer's disease: a chronic oxidative paradigm for testing antioxidant therapies in vivo. *American Journal of Pathology* 152(4): 871-877.
- HHE** Parada, R. 1981. zinc deficiency in molybdenum poisoned cattle. *Veterinary and Human Toxicology* 23(1): 16-21.
- HHE** Parada, R., Gonzalez, S., and Bergqvist, E. 1987. industrial pollution with copper and other heavy metals in a beefcattle ranch. *Veterinary and Human Toxicology* 29(2): 122-126.
- FL** Paragon, B. M. Ecole Nationale Veterinaire d'Alfort Maisons Alfort France Departement Elevage et Pathologie des Equides et Carnivores. 1997. feeding and pathology of the suckling puppy [protein/energy ratio]. <original> alimentation et pathologie du chiot sous la mere [ratio proteo-calorique]; alimentacion y patologia del cachorro con la madre. *Recueil De Medecine Veterinaire*. V. 173(1-3) P. 7-17
- In Vit** Parducz, A., Halasz, N., and Joo, F. 1971. lack of correlation between the zinc-iodide-osmium positivity of cholinergic terminals and the cholinergic transmission in the sympathetic ganglia of the cat. *Journal of Neurochemistry* 18(1): 97-100.
- CP** Pares, A., Deulofeu, R., Gimenez, A., Alie, S., Caballeria, J., Balliesta Am, and Rodes, J. 1995. effects of dietary zinc on vitamin A levels and hepatic fibrogenic activity in alcoholic rats. *Hepatology* 22(4 PART 2): 472A.
- CP** Pares, A., Gimenez, A., Deulofeu, R., Caballeria, J., and Rodes, J. experimental effects of zinc in liver and gut. *Falk Symp. (1997)* 94B(Zinc and Diseases of the Digestive Tract): 59-71.
- CP** Pares A(A), Deulofeu, R., Gimenez, A., Alie, S., Camps, J., Caballeria, J., Ballesta, A. M., and Rodes, J. 1995. the effects of zinc on liver fibrosis are independent on the changes induced on vitamin A metabolism. *Journal of Hepatology* 23(SUPPL. 1): 141.
- No Oral** Parizek, J., Benes, I., Ostadalova, I., Babicky, A., Benes, J., and Lener, J. 1969; (REF:19).

metabolic interactions of trace elements. the effect of some inorganic and organic compounds of selenium on the metabolism of cadmium and mercury in the rat. *Physiol. Bohemoslov.*; 18(2): 95-103

- Bio Acc** Parizek, J., Boursnell, J. C., Hay, M. F., Babicky, A., and Taylor, D. M. 1966. zinc in the maturing rat testis. *Journal of Reproduction and Fertility* 12(3): 501-7.
- Rev** Parizek, J., Clarkson, T. W., Nordberg, G. F., and Sager, P. R. eds. 1983. cadmium and reproduction: a perspective after 25 years. reproductive and developmental toxicity of metals. Pp. 301-314
- Nut def** Park, J. H., Grandjean, C. J., Antonson, D. L., and Vanderhoof, J. A. 1985. effects of short-term isolated zinc deficiency on intestinal growth and activities of several brush border enzymes in weanling rats. *Pediatric Research* 19(12): 1333-6.
- Nut def** Park, J. H., Grandjean, C. J., Hart, M. H., Erdman, S. H., Pour, P., and Vanderhoof, J. A. 1986. effect of pure zinc deficiency on glucose tolerance and insulin and glucagon levels. *American Journal of Physiology* 251(3 Pt 1): E273-8.
- FL** Park, J. H. and Kim, C. S. Korea Advanced Institute of Science and Technology Seoul Korea R. 1984. effects of over-dosed lead and its interaction with iron, copper, zinc or protein supplement in chicks. *Korean Journal of Veterinary Research*. V. 24(1) P. 24-30
- FL** Park, J. H. Korea Advanced Inst. of Science and Technology Seoul Korea R. and Kim, C. S. Tankook Univ. Seoul Korea R. 1985. nickel toxicity and its interaction with zinc, copper and lead in growing chicks. *Korean Journal of Veterinary Research*. V. 25(2) P. 145-148
- Nut def** Park, J. H. Y., Grandjean, C. J., Antonson, D. L., and Vanderhoof, J. A. 1986. effects of isolated zinc deficiency on the composition of skeletal muscle, liver and bone during growth in rats. *The Journal Of Nutrition*. 116(4): 610-617.
- Nut def** Park, J. H. Y., Grandjean, C. J., Antonson, D. L., and Vanderhoof, J. A. 1985. effects of short-term isolated zinc deficiency on intestinal growth and activities of several brush border enzymes in weanling rats. *Pediatric Research* 19(12): 1333-1336.
- Nut def** Park, J. H. Y., Grandjean, C. J., and Vanderhoof, J. A. 1989. effects of pure zinc deficiency on glucose tolerance: role of corticosterone. *Nutrition Research*. 9(2): 183-193.
- Nut def** Park, Jung H. Y., Grandjean, Carter J., Antonson, Dean L., and Vanderhoof, Jon A. effects of isolated zinc deficiency on the composition of skeletal muscle, liver and bone during growth in rats. *J. Nutr.* (1986) 116(4): 610-17.
- Nut def** Park, Jung H. Y., Grandjean, Carter J., Antonson, Dean L., and Vanderhoof, Jon A. effects of short-term isolated zinc deficiency on intestinal growth and activities of several brush border enzymes in weanling rats. *Pediatr. Res.* (1985) 19(12): 1333-6.
- Nut def** Park, Jung H. Y., Grandjean, Carter J., Hart, Michael H., Erdman, Steven H., Pour, Parvis, and Vanderhoof, Jon A. effect of pure zinc deficiency on glucose tolerance and insulin and glucagon levels. *Am. J. Physiol.* (1986) 251(3, Pt. 1): E273-E278.
- Nut def** Park, Jung H. Y., Grandjean, Carter J., and Vanderhoof, Jon A. effects of pure zinc deficiency on glucose tolerance: role of corticosterone. *Nutr. Res. (N. Y.)* (1989) 9(2): 183-93.
- In Vit** Parker Alex, Gockerman Amy, Busby Walker H, and Clemmons David R(A). 1995. properties of an insulin-like growth factor-binding protein-4 protease that is secreted by smooth muscle cells.

Endocrinology 136(6): 2470-2476.

- Fate** Parker, H. M. 1952. *Radiological Sciences Department (Hanford Works): Quarterly Progress Report, Research and Development Activities for October-December 1951.* HW-23332
- Gene** Parkes Tony L, Hilliker Arthur J(A), and Phillips John P. 1993. genetic and biochemical analysis of glutathione-s-transferase in the oxygen defense system of drosophila melanogaster. *Genome* 36(6): 1007-1014.
- No COC** PARKHIE, M. R., WEBB, M., and NORCROSS, M. A. dimethoxyethyl phthalate: embryopathy, teratogenicity, fetal metabolism and the role of zinc in the rat. *ENVIRON HEALTH PERSPECT* 45:89-97,1982
- No Oral** Parkhie, M. R. Webb M. and Norcross M. A. 1982. dimethoxyethyl phthalate: embryopathy, teratogenicity, fetal metabolism and the role of zinc in the rat. *Environ. Health Perspect.* 45: 89-97.
- No COC** Parkinson, D. E., Ellis, R. P., and Lewis, L. D. colostrum deficiency in mule deer odocoileus-hemionus fawns identification treatment and influence on neo natal mortality. *Journal of Wildlife Diseases.* 18 (1). 1982. 17-28.
- Org Met** Parrish, R. F., Perinetti, E. P., and Fair, W. R. 1983. evidence against a zinc binding peptide in pilocarpine-stimulated canine prostatic secretions. *Prostate* 4(2): 189-93.
- Abstract** Parry, W H and Rao, S R R. dietary zinc deficiency and excess on carbonic anhydrase activity in reproductive organs of rats [abstract only]. *Proc Nutr Soc* Dec 1977 36 (3): 101A.
- Unrel** Parsad, C. S. and Arora, S. P. influence of dietary zinc on the activity of alcohol dehydrogenase in different tissues. *Indian J. Anim. Sci.* (1978) 48(8): 582-4.
- Org Met** Parshad, V. R. 1988. laboratory and field evaluation of flocoumafen for rodent control. *International Biodeterioration* 24(6): 475-480.
- Org Met** PARSHAD, V. R., AHMAD, N., and CHOPRA, G. effects of ecological factors on the performance of rodenticides in sugar cane. *PROC INDIAN ACAD SCI ANIM SCI*; 95 (6). 1987. 729-738.
- Org Met** Parshad, V. R. and Kochar, J. K. 1995. potential of three rodenticides to induce conditioned aversion to their baits in the indian mole rat, bandicota bengalensis. *Applied Animal Behaviour Science.* 45(3/4): 267-276.
- Org Met** PARSHAD, V. R., MALHI, C. S., AHMAD, N., and GUPTA, B. rodent damage and control in peanut fields in india. *PEANUT SCI*; 14 (1). 1987. 4-6.
- Org Met** Parshad, V. R. and Malhi, C. S. Department of Zoology Punjab Agricultural University Ludhiana 141004 India. 1995. comparative efficacy of two methods of delivering an anticoagulant rodenticide to three species of south asian rodents. *International Biodeterioration and Biodegradation.* V. 36(1/2) P. 89-102
- No COC** Parshad, V. R. Ahmad N. and Chopra G. 1987. deterioration of poultry farm environment by commensal rodents and their control. *Int.Biodeterior.* 23(1): 29-46.
- No COC** Parshad, V. R. and Kochar J. K. 1995. potential of three rodenticides to induce conditioned aversion to their baits in the indian mole rat, bandicota bengalensis. *Appl.Anim.Behav.Sci.* 45(3/4): 267-276.

- No COC** Parshad, V. R. and Malhi C. S. 1995. comparative efficacy of two methods of delivering an anticoagulant rodenticide to three species of south asian rodents. *Int.Biodeterior.Biodegrad.* 36(1/2): 89-102.
- Rev** Parslow, J. L. F. and Jefferies, D. J. gannets and toxic chemicals. *BR BIRDS. British Birds.* 70 (9). 1977 366-372
- Bio Acc** Parslow, J. L. F., Thomas, G. J., and Williams, T. D. 1982. heavy metals in the livers of waterfowl from the ouse washes, england. *Environ. Pollut. Ser. A* 29(4): 317-27.
- No Oral** Parsons, L. M. and Terman, C. R. 1978. influence of vision and olfaction on the homing ability of the white-footed mouse *peromyscus-leucopus-noveboracensis*. *Journal of Mammalogy.* 59(4): 761-771.
- Nut def** Parsons, Susan E. and Disilvestro, Robert A. effects of mild zinc deficiency, plus or minus an acute-phase response, on galactosamine-induced hepatitis in rats. *Br. J. Nutr. (1994)* 72(4): 611-18
- In Vit** Parvathy, S., Oppong Sylvester Y, Karran Eric H, Buckle Derek R, Turner Anthony J, and Hooper Nigel M(A). 1997. angiotensin-converting enzyme secretase is inhibited by zinc metalloprotease inhibitors and requires its substrate to be inserted in a lipid bilayer. *Biochemical Journal* 327(1): 37-43.
- Alt** Pascoe, E., Arslanian, M., and Reinhold, J. G. zinc concentrations and zinc-65 uptake in liver, intestinal mucosa, and plasma of rats deprived of food. *Pahlavi Med. J. (1971)* 2(1): 29-36.
- No Oral** Pascoe, E., Sha'afi, R. I., Arslanian, M., and Reinhold, J. G. 1971. compartmentation of zinc in rat liver. *Eur. Biophys. Congr. Proc., 1st* : Volume 5, 529-33. Editor(s): Broda, E. Publisher: Verlag Wiener Med. Akad., Vienna, Austria..
- Surv** Pascoe, Gary A., Blanchet, Richard J., Linder, Greg, Palawski, Don, Brumbaugh, William G., Canfield, Tim J., Kemble, Nile E., Ingersoll, Chris G., Farag, Aida, and DalSoglio, Julie A. characterization of ecological risks at the milltown reservoir-clark fork river sediments superfund site, montana . *Environ. Toxicol. Chem. (1994)* 13(12): 2043-58
- Unrel** Pasqualini, C., Guivarc'h, D., Boxberg, Y. V., Nothias, F., Vincent, J. D., and Vernier, P. 1999. stage- and region-specific expression of estrogen receptor alpha isoforms during ontogeny of the pituitary gland. *Endocrinology* 140(6): 2781-9.
- Unrel** Passeri, L. A. and de Carvalho, A. C. 1985. biocompatibility of tissue conditioners--histological study in rats. *Journal of the Nihon University School of Dentistry* 27(3): 167-73.
- Chem Meth** Passey, R. B., Maluf, K. C., and Fuller, R. 1985. quantitation of zinc in nitric acid-digested plasma by atomic-absorption spectrophotometry. *Analytical Biochemistry* 151(2): 462-465.
- Abstract** Pastuszyn, A. and Scallen, T. J. divalent cation effects on 3 hydroxy-3-methyl glutaryl coenzyme a reductase from rat liver. *66TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, NEW ORLEANS, LA., USA, APRIL 15-23, 1982. FED PROC.* 41 (4). 1982. Abstract 5097.
- Unrel** Patel, K., Isaac, A., and Cooke, J. 1999. nodal signalling and the roles of the transcription factors *snr* and *pitx2* in vertebrate left-right asymmetry. *Vol. 9, No. 12, Pp. 609-612* Current Biology
- Unrel** Patel, K. V., Dharni, A. J., and Kodagali, S. B. comparison of physico-biochemical semen characteristics in normal and problem bulls. *Indian Journal of Animal Sciences.* 58 (10). 1988.

1169-1172.

- Mineral** Patel, Kavita P. and Baker, David H. supplemental iron, copper, zinc, ascorbate, caffeine and chlortetracycline do not affect riboflavin utilization in the chick. *Nutr. Res. (N. Y.)* (1996) 16(11/12): 1943-1952.
- Gene** Patel Ketan, Isaac Alison, and Cooke Jonathan(A). 1999. nodal signalling and the roles of the transcription factors snr and pitx2 in vertebrate left-right asymmetry. *Current Biology* 9(11): 609-612.
- Nut def** Patel, P. B., Chung, R. A., and Lu, J. Y. effect of zinc deficiency on serum and liver cholesterol in the female rat. *Nutr. Rep. Int.* (1975) 12(3): 205-10.
- Gene** Patel, T., Arora, A., and Gores, G. J. 1995. a fluorometric assay for quantitating dna strand breaks during apoptosis. *Analytical Biochemistry* 229(2): 229-35.
- Drug** Paternain, J. L., Folch, J., and Bosque, M. A. zinc, copper and metallothionein content in mice treated with 2,3-dimercapto-1-propanesulfonate (dmpps) during embryogenesis. *Rev. Toxicol.* (1993) 10(3): 146-50.
- Nut def** Paterson, P. G., Allen, O. B., and Bettger, W. J. 1987. effect of dietary zinc deficiency on the endogenous phosphorylation and dephosphorylation of rat erythrocyte membrane. *The Journal Of Nutrition.* 117(12): 2096-2105.
- Nut def** Paterson, P. G. and Bettger, W. J. 1986. effect of dietary zinc intake on the hematological profile of the rat. *Comparative Biochemistry and Physiology* 83(4): 721-5.
- CP** Paterson, P. G. and Bettger, W. J. 1985. effect of dietary zinc intake on the hematology of the rat. *Federation Proceedings* 44: 1509.
- CP** Paterson, P. G., Gottschall-Pass, K. T., Grahn, B. H., and Gorecki, D. K. J. 1997. effect of zinc and taurine status during prenatal and postnatal periods on oscillatory potentials in the mature rat retina. *Trace Elem. Man Anim.--9 Proc. Int. Symp., 9th* : Meeting Date 1996, 89-90. Editor(s): Fischer, Peter W. F. Publisher: National Research Council of Canada, Ottawa, Ont.
- Phys** Paterson, P. G., Sarkar, B., and Zlotkin, S. H. 1990. the effect of zinc levels in fetal circulation on zinc clearance across the in situ perfused guinea pig placenta. *Canadian Journal of Physiology and Pharmacology* 68(11): 1401-6.
- CP** Paterson, Phyllis G. and Bettger, William J. 1985. effect of dietary zinc intake on the stability of the rat erythrocyte membrane. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th* : Meeting Date 1984, 79-83. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK..
- Nut def** Paterson, Phyllis G. and Bettger, William J. 1986. effect of dietary zinc uptake on the hematological profile of the rat. *Comp. Biochem. Physiol. A: Comp. Physiol.* 83A(4): 721-5
- Nut def** Paterson, Phyllis G. and Card, Robert T. the effect of zinc deficiency on erythrocyte deformability in the rat. *J. Nutr. Biochem.* (1993) 4(4): 250-5.
- No Oral** Paterson, Phyllis G., Mas, Alberto, Sarkar, Bibudhendra, and Zlotkin, Stanley H. the influence of zinc-binding ligands in fetal circulation on zinc clearance across the in situ perfused guinea pig placenta. *J. Nutr.* (1991) 121(3): 338-44 .
- Diss** Paterson, Phyllis Grace. 1987. the effect of dietary zinc deficiency on the structure and

- function of the rat erythrocyte membrane. *NLC From: Diss. Abstr. Int. B* 1988. 48. 8. 2270-1.
- Unrel** Paterson, R. C. 1981. pulp response in sound and carious teeth: a pilot study. *Oral Surgery, Oral Medicine, and Oral Pathology* 51(2): 209-12.
- Rev** Patrick, J. and Dervish, C. 1984. leukocyte zinc in the assessment of zinc status. *Crc Critical Reviews In Clinical Laboratory Sciences* 20(2): 95-114.
- Nut def** Patterson, W. P., Winkelmann, M., and Perry, M. C. 1985. zinc-induced copper deficiency - megamineral sideroblastic anemia. *Annals Of Internal Medicine* 103(3): 385-386.
- In Vit** Pattison, S. E. and Cousins, R. J. 1986. zinc uptake and metabolism by hepatocytes. *Federation Proceedings* 45(12): 2805-2809.
- In Vit** Pattison, S. E. and Dunn, M. F. 1975. on the relationship of zinc ion to the structure and function of the 7s nerve growth factor protein. *Biochemistry* 14(12): 2733-9.
- Abstract** Pattison, S. E. and Dunn, M. F. relationship of zinc to the structure and function of nerve growth factor. *Federation Proceedings*. 33 (5 Part 2). 1974 1343
- FL** Paulicks, B. R. Technische Univ. Muenchen Freising Germany Inst. fuer Ernaehrungsphysiologie and Kirchgessner, M. 1994. effects of alimentary zinc supply on feed intake and performance of laying hens. <original> zum einfluss der zinkversorgung auf die Futteraufnahme und leistung von legehennen. *Archiv Fuer Gefluegelkunde*. V. 58(4) P. 186-191
- Prim** Paulini, I., Poetter, C., Mehta, T., and Kincaid, R. L. 1988. zinc and copper bioavailability in monkeys and rats with psylliumconsumption. *Nutrition Research* 8(4): 401-412.
- Prim** Paulini, Inge, Poetter, Cornelia, Mehta, Tara, and Kincaid, Ronald L. zinc and copper bioavailability in monkeys and rats with psyllium consumption. *Nutr. Res. (N. Y.)* (1988) 8(4): 401-12.
- FL** Pavelka, J. and Sedlacek, O. 1980. contamination of farm animals with emissions from a tinning plant withreference to tin and cadmium. *Sbornik Vedeckych Praci Ustredniho Statniho Veterinariho Ustavu* (10): 95-104.
- Unrel** Pavlica, Z., Juntos, P., and Pogacnik, M. 2000. defence reaction in dental pulp after pulp capping and partialpulpectomy in dogs. *Acta Veterinaria Hungarica* 48(1): 23-34.
- FL** Pavlik, V., Kociscak, E., Vilinska, Z., and Kappel, G. Vyskumny Ustav Zivocisnej Vyroby Nitra Slovak Republic. 1998. application of fattening system for bulls pastured on the east slovakian lowland. <original> uplatnenie systemu vykrmu byckov pasienkovym sposobom na vychodoslovenskej nizine. *Polnohospodarstvo. <Subtitle>Agriculture - Journal for Aricultural Sciences*. V. 44(9) P. 699-708
- Unrel** Pawlikowski, M. and Kula, K. 1973. a simple method of revealing some stages of spermiogenesis by means of staining with zinc iodide and osmic acid mixture. *Endokrynologia Polska* 24(4): 317-21.
- FL** Paya, A. B. 1980. the effect of zn and cd on bone metabolism and their interaction. 1. *Avances En Alimentacion y Mejora Animal* 21(5): 217-224.
- No COC** Payen, E., Verkerk, T., Michalovich, D., Dreyer, S. D., Winterpacht, A., Lee, B., De Zeeuw CI, Grosveld, F., and Galjart, N. 1998. the centromeric/nucleolar chromatin protein zfp-37 may

function to specify neuronal nuclear domains. *Journal of Biological Chemistry* 273(15): 9099-109.

- Nut def** Paynter, D. I., Moir, R. J., and Underwood, E. J. changes in activity of the copper zinc superoxide dismutase ec-1.15.1.1 enzyme in tissues of the rat with changes in dietary copper. *J NUTR. Journal of Nutrition.* 109 (9). 1979. 1570-1576.
- Phys** PAYNTER, J. A., CAMAKARIS, J., and MERCER, J. FB. analysis of hepatic copper, zinc, metallothionein and metallothionein-ia messenger rna in developing sheep. *EUR J BIOCHEM;* 190 (1). 1990. 149-154.
- Gene** Paznekas, W. A., Okajima, K., Schertzer, M., Wood, S., and Jabs, E. W. 1999. genomic organization, expression, and chromosome location of the human snail gene (snai1) and a related processed pseudogene (snai1p). *Vol. 62, No. 1, Pp. 42-49 Genomics*
- Bact** Peck, M. D. and Alexander, J. W. 1992. interaction of protein and zinc malnutrition with the murine response to infection. *Journal of Parenteral and Enteral Nutrition* 16(3): 232-5.
- Nut def** Pedersen, B. and Eggum, B. O. 1983. interrelations between protein and zinc utilization in rats. *Nutrition Reports International* 27(3): 441-453.
- Nut** Pedersen, B. and Eggum, B. O. 1983. interrelations between protein-utilization and zinc utilization in rats. *Nutrition Reports International* 27(3): 441-453.
- HHE** Pedersen, B., Kalinowski, L. S., and Eggum, B. O. 1987. the nutritive value of amaranth grain (amaranthus caudatus). 1. proteinand minerals of raw and processed grain. *Qualitas Plantarum: Plant Foods for Human Nutrition* 36(4): 309-324.
- No Dose** Pedersen, H. C. and Myklebust, I. 1993. age-dependent accumulation of cadmium and zinc in the liver and kidneys of norwegian willow ptarmigan. *BULL ENVIRON CONTAM TOXICOL.* 51(3): p381-388.
- Gene** Pedersen Ward A, Chan Sic L, and Mattson Mark P(A). 2000. a mechanism for the neuroprotective effect of apolipoprotein e: isoform-specific modification by the lipid peroxidation product 4-hydroxynonenal. *Journal of Neurochemistry* 74(4): 1426-1433.
- Unrel** Pedersen Ward A and Mattson Mark P(A). 1999. no benefit of dietary restriction on disease onset or progression in amyotrophic lateral sclerosis cu/zn-superoxide dismutase mutant mice. *Brain Research* 833(1): 117-120.
- Gene** Pedone, P. V., Omichinski, J. G., Nony, P., Trainor, C., Gronenborn, A. M., Clore, G. M., and Felsenfeld, G. 1997. the n-terminal fingers of chicken gata-2 and gata-3 are independent sequence-specific dna binding domains. *The Embo Journal.* 16(10): 2874-2882.
- Nut** Pedrosa, Lucia de Fatima Campos and Cozzolino, Silvia Maria Franciscato. zinc bioavailability of a regional diet of northeast brazil. *Rev. Farm. Bioquim. Univ. Sao Paulo (1990)* 26(2): 123-33.
- Bio Acc** Pedroso, R., Navarro, M., and Podial, C. 1986. concentrations of some biochemical blood constituents in 3/4holstein-friesian-1/4 zebu and 3/4 brown swiss-1/4 zebu heifers andtheir sources of variation. *Revista Cubana De Reproduccion Animal* 12(2): 113-140.
- No COC** Pei, D. 1999. identification and characterization of the fifth membrane-type matrix metalloproteinase mt5-mmp. *Vol. 274, No. 13, Pp. 8925-8932 Journal Of Biological Chemistry*

- No Oral** Pei, Yin Quan and Koyama, Ikuko . features of seizures and behavioral changes induced by intrahippocampal injection of zinc sulfate in the rabbit : a new experimental model of epilepsy. *Epilepsia (N. Y.)* (1986) 27(3): 183-8.
- Drug** Peixoto, Paulo Vargas A, Moraes, Sheila Da Silva, and Lemos, Ricardo A. 1994. occurrence of inherited parakeratosis (lethal trait a-46) in brazil. *Pesquisa Veterinaria Brasileira* 14(2-3): 79-84.
- Nut def** Pekarek, R. S., Hoagland, A. M., and Powanda, M. C. humoral and cellular immune responses in zinc deficient rats.
- Nut def** Pekarek, R. S. and Powanda, M. C. 1976. protein synthesis in zinc deficient rats during tularemia. *Journal of Nutrition* 106(7): 905-12.
- BioX** Pekarek, Robert S. and Beisel, William R. 1969. effect of endotoxin upon serum zinc concentrations in the rat. *Appl. Microbiol.* 18(3): 482-4 .
- Nut def** Pekarek, Robert S. and Powanda, Michael C. protein synthesis in zinc deficient rats during tularemia. *J. Nutr.* (1976) 106(7): 905-12.
- CP** Pekary, A. E., Lukaski, H. C., Mena, I., and Hall, C. zinc deficiency inhibits and caloric restriction stimulates the posttranslational processing of trh precursor peptides in male rats. *ABSTRACTS SUBMITTED TO THE JOINT MEETING OF THE WESTERN SOCIETY FOR CLINICAL INVESTIGATION, WESTERN SECTION AMERICAN FEDERATION FOR CLINICAL RESEARCH, WESTERN SOCIETY FOR PEDIATRIC RESEARCH, WESTERN REGION SOCIETY FOR INVESTIGATIVE DERMATOLOGY, WESTERN STUDENT MEDICAL RESEARCH COMMITTEE, CARMEL, CALIFORNIA, USA, FEBRUARY 6-9, 1991. CLIN RES.* 39 (1). 1991. 123a.
- Nut def** Pekary, A. Eugene, Lukaski, Henry C., Mena, Ishmael, and Hershman, Jerome M. 1991. processing of trh precursor peptides in rat brain and pituitary is zinc dependent. *Peptides (Fayetteville N. Y.)* 12(5): 1025-32 .
- Nut def** Pekary, A. Eugene, Lukaski, Henry C., Mena, Ishmael, Smith, Scott M., Bhasin, Shalender, and Hershman, Jerome M. testosterone increases trh biosynthesis in epididymis but not heart of zinc-deficient rats. *Peptides (Pergamon)* (1993) 14(2): 315-24
- Mix** Pekelharing, H. L. M., Lemmens, A. G., and Beynen, A. C. iron, copper and zinc status in rats fed on diets containing various concentrations of tin. *Br. J. Nutr.* (1994) 71(1): 103-9 .
- Aquatic** Pelech, S. L., Meijer, L., and Krebs, E. G. characterization of maturation-activated histone h1 and ribosomal s6 kinases in sea star oocytes. *Biochemistry.* 26 (24). 1987. 7960-7968.
- Alt** Peled-Kamar Mira, Lotem Joseph, Okon Elimelech, Sachs Leo, and Groner Yoram= (A). 1995. thymic abnormalities and enhanced apoptosis of thymocytes and bone marrow cells in transgenic mice overexpressing cu/zn-superoxide dismutase: implications for down syndrome. *EMBO (European Molecular Biology Organization) Journal* 14(20): 4985-4993.
- Mix** Pelevin, A. D., Solov'ev, L. M., Gneusheva, L. P., Galushkina, T. S., Tishkov, A. I., Lyashko, N. I., Ben'yash, E. Ya., and Kazantseva, L. M. zinc for feed. *Khim. Sel'Sk. Khoz.* (1989) (11): 73-4.
- FL** Pelissier, M. A., Atteba, S., Manchon, P., and Albrecht, R. 1976. decreased activity of liver microsome oxygenases in rats given zinebdiet. *Annales De La Nutrition Et De L'Alimentation* 30(1): 45-54.

- Org Met** PELISSIER, M. A., ATTEBA, S., MANCHON, P., and ALBRECHT, R. lessening of the liver activity of microsomal oxygenase in the rat fed on a diet added with zineb. *ANN NUTR ALIMENT*; 30 (1). 1976 (RECD 1977) 45-54
- FL** Pelissier, M. A., Atteba, S., Manchon, P. h., and Albrecht, R. 1976. [diminution of activity of liver microsomal oxygenase in a rat fed a diet with added zineb]. <original> diminution d'activite des oxygenases microsomales du foie chez le rat nourri avec un regime additionne de zinebe. *Annales De La Nutrition Et De L'Alimentation* 30(1): 45-54.
- Nut def** Pelissier, M. A., Faudemay, F., Dooh-Priso, E., Atteba, S., and Albrecht, R. 1981. decrease in activity of oxygenases in liver microsomes of rats causedby zineb, a dithiocarbamate fungicide: effects of a diet with 9%casein. *Food and Cosmetics Toxicology* 19(3): 357-360.
- FL** Pelissier, M. A., Faudemay, F., Dooh-Priso, E., Atteba, S., and Albrecht, R. diminution par un dithiocarbamate fongicide, le zinebe, de l'activite des oxygenases microsomales du foie chez la rat: effets d'un regime a 9% de caseine. [decrease in the activity of microsomal oxygenases in rat liver by the dithiocarbamate fungicide zineb: effects of a diet containing 9% casein.]. *Food Cosmet. Toxicol.* 19(3): 357-360 1981 (25 References)
- Mix** Pelissier, M. A., Faudemay, F., Dooh-Priso, E., Atteba, S., and Albrecht, R. reduction in the activity of microsomal liver oxygenases in the rat by a di thio carbamate fungicide zineb effects of diet containing 9 percent casein. *Food and Cosmetics Toxicology.* 19 (3). 1981. 357-360.
- Alt** Peltola Ville(A), Huhtaniemi Ilpo, and Ahotupa Markku. 1995. abdominal position of the rat testis is associated with high level of lipid peroxidation. *Biology of Reproduction* 53(5): 1146-1150.
- No COC** Pena-de-Ortiz, S. and Jamieson, G. A. Jr. 1997. molecular cloning and brain localization of hzf-2 alpha, a new member of the rev-erb subfamily of orphan nuclear receptors [published erratum appears in j neurobiol 1997 jun 5;32(6):640-1]. *Journal of Neurobiology* 32(3): 341-58.
- Nut def** Penate, M. A., Padron, M., Hernandez, M., Diaz, R., Martin, M., and Ponce de Leon, I. 1990. effect of a zinc-deficient diet on nitrogen balance in rats. *J. Hyg. Epidemiol., Microbiol., Immunol.* 34(3): 267-71.
- Meth** Peng, S., Shan, X. Q., Zheng, Y., Jin, L. Z., and Xu, W. B. 1991. determination of dietary cadmium-induced metallothioneins in rabbit kidneys and cadmium in metallothioneins by anion-exchange high-performance liquid chromatography coupled with graphite furnace atomic absorption spectrometry. *Journal of Chromatography* 572(1-2): 73-84.
- Phys** Penkowa, M., Nielsen, H., Hidalgo, J., Bernth, N., and Moos, T. 1999. distribution of metallothionein i + ii and vesicular zinc in the developing central nervous system: correlative study in the rat. *Journal of Comparative Neurology* 412(2): 303-18 .
- FL** Pentieva, K. and Donchev, N. effect of elevated doses of copper and zinc on the pathomorphological changes in abdominal aorta during chronic experimental carbon sulfide intoxication. i. histological studies. *Khig. Zdraveopaz. (1991)* 34(2): 59-64.
- Bact** Pepin, M., Pardon, P., Lantier, F., Marly, J., Levieux, D., and Lamand, M. 1991. experimental corynebacterium pseudotuberculosis infection in lambs:kinetics of bacterial dissemination and inflammation. *Veterinary Microbiology* 26(4): 381-392.
- CP** Percival, S. S., Langkamp-Henken, B., Satcher, R., Karimabakas, J., and Herrlinger-Garcia, K. 1996. perinatal copper deficient mouse model exhibits neutropenia. *FASEB Journal* 10(3): A293.

- CP** Percival, S. S. and Satcher, R. 1997. bone marrow cell characteristics in a perinatal copper deficient mouse model. *FASEB Journal* 11(3): A182.
- Diss** Perdomo, J. T. 1976. availability of nutrient minerals in four tropical forages fed assoilage to sheep. *Dissertation Abstracts International, B* 36(12,I): 5880-5881.
- FL** Perepelenko, S. D., Isakov, Kh. I., and Mavaeva, E. N. effect of excess copper and zinc on nucleic acid metabolism in rabbit organs. *Uzb. Biol. Zh.* (1979) (1): 32-4 .
- No Tox** Perera, B. M. A. O., Kuruwita, V. Y., Mohan, V., Chandratilake, D., and Karunaratne, A. M. 1988. effects of some managerial factors on postpartum reproduction in buffaloes and goats. *Acta Veterinaria Scandinavica* (Supplement 83): 91-100.
- Nut** Peres, Jean-Michel, Bouhallab, Said, Bureau, Francois, Maubois, Jean-Louis, Arhan, Pierre, and Bougle, Dominique. reduction of iron/zinc interactions using metal bound to the caseinophosphopeptide 1-25 of .beta.-casein. *Nutr. Res. (N. Y.)* (1999) 19(11): 1655-1663 .
- No COC** Peret, J., Chanez, M., Fau, D., and Bois-Joyeux, B. 1978. lipogenic activity of some hepatic enzymes in rat: effects of dietaryprotein level, insulin and cortisol. *Annales De Biologie Animale, Biochimie, Biophysique* 18(5): 1173-1180.
- No Oral** Peret, J. and Chanez, M. CS Centre de Recherches sur la Nutrition du Meudon-Bellevue France. 1976. influence of diet, cortisol and insulin on the activity of pyruvatecarboxylase and phosphoenolpyruvate carboxykinase in the rat liver. *Journal of Nutrition* 106(1): 103-110.
- Unrel** Perez-Alvarado, Gabriela C., Kosa, Jessica L., Louis, Heather A., Beckerle, Mary C., Winge, Dennis R., and Summers, Michael F. structure of the cysteine-rich intestinal protein, crip. *J. Mol. Biol.* (1996) 257(1): 153-74.
- FL** Perez Gallardo Norma Silvia(A), Pina Barba Mario Cristina, Olivera Ayub= Alicia(A), Del Villar Velasco Jorge Luna(A), Uribe Patricia Izquierdo= (A), Palma Cortes Roberto Benito, Torres Villasenor Karina, and Torres Villasenor Gabriel. 1996. preliminary study of zinalco alloy biocompatibility. *Veterinaria - Mexico* 27(4): 325-329.
- Nut def** Perez-Jimenez, F., Bockman, D. E., and Singh, M. 1986. pancreatic acinar cell function and morphology in rats fed zinc-deficient and marginal zinc-deficient diets. *Gastroenterology* 90(4): 946-57.
- Nut def** Perez-Jimenez, Francisco, Bockman, Dale E., and Singh, Manjit. pancreatic acinar cell function and morphology in rats fed zinc-deficient and marginal zinc-deficient diets. *Gastroenterology* (1986) 90(4): 946-57.
- BioX** Perez, L., Irurzun, A., and Carrasco, L. 1993. activation of phospholipase activity during semliki forest virus infection. *Virology* 194(1): 28-36.
- Nut def** Perez-Labajos, J., Gonzalez-Reimers, E., Santolaria, F., Batista, N., Rodriguez-Moreno, F., Martinez-Riera, A., Rodriguez-Rodriguez, E., and Molina-Perez, M. 1996. relative and combined effects of propylthiouracil (ptu), ethanol and protein deficiency on muscle. *Met. Ions Biol. Med. Proc. Int. Symp., 4th* : 436-438. Editor(s): Coltery, Philippe. Publisher: Libbey Eurotext, Montrouge, Fr..
- Unrel** Perezclausell, J., Frederickson, C. J., and Danscher, G. 1989. amygdaloid efferents through the stria terminalis in the rat give origin to zinc-containing boutons. *Journal Of Comparative Neurology* 290(2): 201-212.

- Anat** Perie, G. and Coujard, R. a special aspect of myelinization evidence by means of the osmium tetr oxide iodine zinc complex rat sciatic nerve regeneration histology. *C R ASS ANAT.* 136. 1967 770-772
- Unrel** Perkins, A. S., Mercer, J. A., Jenkins, N. A., and Copeland, N. G. patterns of evi-1 expression in embryonic and adult tissues suggest that evi-1 plays an important regulatory role in mouse development. *DEVELOPMENT (CAMB). DEVELOPMENT (Cambridge).* 111 (2). 1991. 479-488.
- No COC** Perlman, H., Suzuki, E., Simonson, M., Smith, R. C., and Walsh, K. 1998. gata-6 induces p21 super(cip1) expression and g sub(1) cell cycle arrest. *Vol. 273, No. 22, Pp. 13713-13718 J. Biol. Chem.*
- Abstract** Perrotto, B. M. and Erausquin, J. response of residual pulp after pulp extirpation at different levels.*Journal of Dental Research.* 50 (5 Part 1). 1971 1154
- CP** Perry, H. Mitchell Jr. 1969. hypertension and trace metals, with particular emphasis on cadmium. *Trace Subst. Environ. Health - 2 Proc. Univ. Mo. Annu. Conf., 2nd* : Meeting Date 1968, 101-25. Editor(s): Hemphill, Delbert D. Publisher: Univ. of Missouri, Columbia, Mo..
- No Oral** Perry, H. Mitchell Jr. and Erlanger, Margaret. hypertension and tissue metal levels after intraperitoneal cadmium, mercury, and zinc. *Amer. J. Physiol. (1971)* 220(3): 808-11 .
- Nut def** Perryman, L. E. Washington State Univ. Pullman WA USA Dept. of Veterinary Microbiology and Pathology, Leach, D. R., Davis, W. C., Mickelsen, W. D., Heller, S. R., Ochs, H. D., Ellis, J. A., and Brummerstedt, E. 1989. lymphocyte alterations in zinc-deficient calves with lethal trait a46. *Veterinary Immunology and Immunopathology.* V. 21(3) P. 239-248
- CP** PERSAUD, T. VN and SEYOUM, G. 1997. ethanol embryopathy influence of zinc and methionine. *ANNUAL MEETING OF THE PROFESSIONAL RESEARCH SCIENTISTS ON EXPERIMENTAL BIOLOGY 97*
- Rev** Pershagen, G. and Vahter, M. 1979.
- No Oral** Pertot, W. J., Camps, J., Remusat, M., and Proust, J. P. 1992. in vivo comparison of the biocompatibility of two root canal sealers implanted into the mandibular bone of rabbits. *Oral Surgery, Oral Medicine, and Oral Pathology* 73(5): 613-20.
- Org Met** PERVEZ, A., AHMAD, S. M., WAQAR, S., and RIZVI, A. comparative efficacy of bromadiolone cholecalciferol and zinc phosphide against short-tailed mole rat nesokia indica in captivity. *TURKISH JOURNAL OF ZOOLOGY; 22 (2).* 1998. 137-140.
- Org Met** PERVEZ, A., AHMED, S., AHMAD, S., and ALI RIZVI S. the significance of additives to enhance poison bait acceptance against rodents damaging paddy in lower sindh, pakistan. *PAKISTAN JOURNAL OF ZOOLOGY; 31 (3).* 1999. 207-210.
- No COC** PERVEZ, A. Ahmed S. M. Ahmad S. and Ali Rizvi S. W. 1999. the significance of additives to enhance poison bait acceptance against rodents damaging paddy in lower sindh, pakistan. *Pak.J.Zool.* 31(3): 207-210.
- Diss** Pescatore, A. J. 1982. production parameters and steroid hormone profiles of caged turkeybreeders. *Dissertation Abstracts International, B* 42(10): 3887.
- Phys** Pesheva, P., Probstmeier, R., Spiess, E. , and Schachner, M. divalent cations modulate the inhibitory substrate properties of murine glia-derived j1-160 and j1-180 extracellular matrix

glycoproteins for neuronal adhesion. *EUR J NEUROSCI.* 3 (4). 1991. 356-365.

- In Vit** Pesheva, Penka A and Probstmeier, Rainer. 2000. association of tenascin-r with murine brain myelin membranes: involvement of divalent cations. *Neuroscience Letters* 283(3): 165-168.
- Abstract** Petering, D. and Fowler, B. distribution of copper zinc cadmium metallo thionein among cellular compartments of the kidney effect of diet on metal content and localization. *67TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, CHICAGO, ILL., USA, APRIL 10-15, 1983. FED PROC.* 42 (4). 1983. Abstract 4937.
- CP** Petering, D. H. and Fowler, B. zn deficiency in the rat: relationship between growth and metal content and distribution. *Trace Elements In Man And Animals 6 / Edited By Lucille S. Hurley, ... [Et Al.].* p. 475-476.
- CP** Petering, D. H., Krezoski, S., Lehn, D., Stone, D., and Loomans, H. use of metal chelating agents to modulate ehrlich cell growth multiple metal-ligand interactions. *Trace Elements In Man And Animals 6 / Edited By Lucille S. Hurley, ... [Et Al.].* p. 75-76.
- CP** Petering, D. H., Loftsgaarden, J., Schneider, J., and Fowler, B. metabolism of cadmium, zinc and copper in the rat kidney: the role of metallothionein and other binding sites. *E H P Environmental Health Perspectives.* Mar 1984. v. 54 p. 73-81. ill.
- Nut def** Petering, David H., Stemmer, K. L., Lyman, Suzanne, Krezoski, Susan, and Petering, Harold G. iron deficiency in growing male rats : a cause of development of cardiomyopathy. *Ann. Nutr. Metab. (1990)* 34(4): 232-43.
- CP** Petering, H. G. the influence of dietary zinc and copper on the biologic effects of orally ingested lead in the rat (people, livestock, toxicity). *Annals Of The New York Academy Of Sciences.* 1980. v. 355 p. 298-308.
- Nut def** Petering, H. G., Giroux, E., Choudhury, H., and Menden, E. E. consecutive zinc balance trials in growing rats. *Biol. Trace Elem. Res. (1982)* 4(2-3): 221-32
- Abstract** Petering, H. G., Johnson, M., and Stemmer, K. effect of cadmium on dose response relationships of zinc in rats abstract growth leukocytes hemo globin temperature blood zinc. *FED PROC. Federation Proceedings.* 28 (2). 1969 691
- Nut def** Petering, H. G., Murthy, L., Stemmer, K. L., Finelli, V. N., and Menden, E. E. 1986. effects of copper deficiency on the cardiovascular system of the rat . the role of dietary sucrose and excessive zinc. *Biol. Trace Elem. Res.* 9(4): 251-70 .
- CP** Petering, H. G., Stemmer, K. L., Gartside, P. S., and Finelli, V. N. 1986. effects of a high dietary level of zinc (zn), copper (cu) and iron (fe) on lipid and mineral metabolism in aging male sprague-dawley rats fed 1-percent cholesterol (chol). *Federation Proceedings* 45: 1080.
- Rev** Petering, Harold G. the influence of dietary zinc and copper on the biologic effects of orally ingested lead in the rat. *Ann. N. Y. Acad. Sci. (1980)* 355(Micronutr. Interact.: Vitam., Miner., Hazard. Elem.): 298-308 .
- Nut def** Petering, Harold G., Murthy, Lalitha, and O'Flaherty, Ellen. influence of dietary copper and zinc on rat lipid metabolism. *J. Agric. Food Chem. (1977)* 25(5): 1105-9 .
- No Dose** Peters, A. R., Wray, C., and Allsup, T. N. 1987. serological response of calves to a dead salmonella vaccine and itsrelation to live weight and performance. *Veterinary Record* 121(4): 84-85.

- Nut def** Peters, Alice J., Keen, Carl L., Lonnerdal, Bo, and Hurley, Lucille S. zinc-vitamin a interaction in pregnant and fetal rats : supplemental vitamin a does not prevent zinc-deficiency-induced teratogenesis. *J. Nutr.* (1986) 116(9): 1765-71.
- Nut def** Peters, D. P. effects of pre natal nutritional deficiency on affiliation and aggression in rats. *Physiology & Behavior.* 20 (4). 1978 359-362.
- Nut def** Peters, D. P. effects of pre natal nutritional deficiency on discrimination learning in rats acquisition and retention. *Psychological Reports.* 44 (2). 1979. 451-456.
- In Vit** Peters, J. M., Duncan, J. R., Rucker, R. B., Wiley, L. M., and Keen, C. L. influence of a metallothionein antisense oligodeoxyribonucleotide on mouse preimplantation embryo development. *Teratology* 1994 May;49(5):408
- Abstract** Peters, J. M., Hanna, L., Wiley, L. M., Zidenberg-Cherr, S., and Keen, C. L. maternal dietary zinc (zn) deprivation does not exacerbate the effect of low dose irradiation on embryo and fetal development in mice. *Teratology* 1996 Feb;53(2):120
- CP** PETERS, J. M., KEEN, C. L., and GONZALEZ, F. 1997. diethylhexyl phthalate dehp induces zinc zn deficiency during pregnancy and its teratogenicity is not mediated through a peroxisome proliferator-activated receptor-alpha-pparalpha dependent pathway. *JOINT MEETING OF THE TERATOLOGY SOCIETY THIRTY-SEVENTH ANNUAL MEETING AND TENTH INTERNATIONAL CONFERENCE OF THE ORGANIZATION OF TERATOLOGY INFORMATION SERVICES*
- Nut def** Peters, J. M., Taubeneck, M. W., Keen, C. L., and Gonzalez, F. J. 1997. di(2-ethylhexyl) phthalate induces a functional zinc deficiency during pregnancy and teratogenesis that is independent of peroxisome proliferator-activated receptor-alpha. *Teratology* 56(5): 311-6.
- Phys** Petersen Donna N, Tkalcovic George T, Koza-Taylor Petra H, Turi Tom G, and Brown Thomas A(A). 1998. identification of estrogen receptor beta2, a functional variant of estrogen receptor beta expressed in normal rat tissues. *Endocrinology* 139(3): 1082-1092.
- Alt** Petersen, J., Ross, J., and Rabkin, R. 1988. effect of insulin therapy on established diabetic nephropathy in rats. *Diabetes* 37(10): 1346-50.
- Yeast** Petersen, M. K., Streeter, C. M., and Clark, C. K. 1987. mineral availability with lambs fed yeast culture. *Nutrition Reports International* 36(3): 521-525.
- Nut def** Peterson Donny J and Prohaska Joseph R(A). 1999. evaluation of rat white blood cell and plasma peptidylglycine alpha-amidating monooxygenase activity as indicators of copper status. *Nutrition Research* 19(7): 1041-1047.
- No Oral** Petersson Grawe, Kierstin and Oskarsson, Agneta. cadmium in milk and mammary gland in rats and mice. *Arch. Toxicol.* (2000) 73(10-11): 519-527.
- CP** Petit, T. L. lead-zinc interactions in the central nervous system with particular reference to the hippocampus. *FREDERICKSON, C. J., G. A. HOWELL AND E. J. KASARSKIS (ED.). NEUROLOGY AND NEUROBIOLOGY, VOL. 11B. THE NEUROBIOLOGY OF ZINC: PART B. DEFICIENCY, TOXICITY, AND PATHOLOGY; PROCEEDINGS OF A SATELLITE SYMPOSIUM TO THE ANNUAL MEETING OF THE SOCIETY FOR NEUROSCIENCE, BOSTON, MASS., USA, NOV. 4-6, 1983. XIII+345P. ALAN R. LISS, INC.: NEW YORK, N.Y., USA. ILLUS. ISBN 0-8451-2713-6. 0 (0). 1984. 251-274.*
- Nut def** Petit, Ted L. and LeBoutillier, Janelle C. zinc deficiency in the postnatal rat : implications for

lead toxicity. *Neurotoxicology* (1986) 7(1): 237-46.

- FL** Petkov, K., Madzirov, Z., and Ilkovski, R. 1979. heavy metals (lead and cadmium) as pollutants of the environment. *Veterinarski Glasnik* 33(7): 511-518.
- FL** Petkov, P. and Georgiev, P. 1982. clinical and biochemical studies on parakeratosis in piglets. *Veterinarnomeditsinski Nauki* 19(4): 42-49.
- In Vit** Petkov, P. E., Galabova, R., and Gospodinov, C. 1968. histochemistry of the pancreatic islets in golden hamster *mesocricetus auratus* waterhouse 1839. *Histochemie* 15(4): 318-32.
- FL** Petkov, P. I., Georgiev, P., and Delistamatis, V. 1987. biochemical and radioimmunological investigation of cannibalism among intensively reared pigs. *Veterinarnomeditsinski Nauki* 24(8): 75-80.
- FL** Petkova, E., Venkov, T., and Stanchev, Kh. 1983. effect of bulgarian potassium-calcium zeolite on some major and trace elements in lambs. *Veterinarnomeditsinski Nauki* 20(8): 36-40.
- In Vit** Petrie, L., Chesters, J. K., and Franklin, M. Biochemistry Division Rowett Research Institute Bucksburn Aberdeen AB2 9SB United Kingdom. 1991. inhibition of myoblast differentiation by lack of zinc. *Biochemical Journal (London)*. V. 276(1) P. 109-111
- Gene** PETRILLI, F. L. and DE FLORA S. metabolic deactivation of hexavalent chromium mutagenicity. *MUTAT RES*; 54 (2). 1978 139-148
- Nut def** Petrova I(A), Angelov L(A), and Dragnev H(A). 1998. influence of the complex cu-zn-se-j deficit on trace element balance of the organism of growing lambs. *Zhivotnov" Dni Nauki* 0(SUPPL. 2): 53-56.
- Org Met** PETROVA-VERGIEVA, T. and IVANOVA-CHEMISHANSKA, L. teratogenic effect of zinc ethylenebis(dithiocarbamate)(zineb) on the rat. *EKSP MED MORFOL* 10:336-340, 1971
- No COC** Pettersson, A. 1974. payzone nitrovin as a growth promoter for bacon pigs. *Acta Agriculturae Scandinavica*. 24(2): 93-98 .
- Nut** Petukhova, E. A., Ryazanov, G. P., and Eremko, N. I. 1985. use of feed mixtures with meprin during rearing of chickens. *Intensifikatsiya Proizvodstva Yaits i Myasa Ptitsy*. 17-24.
- Gene** Pfeffer, P. L., De Robertis, E. M., and Izpisua-Belmonte, J. C. 1997. crescent, a novel chick gene encoding a frizzled-like cysteine-rich domain, is expressed in anterior regions during early embryogenesis. *International Journal of Developmental Biology* 41(3): 449-58.
- Rev** PFEIFFER, C. C. international review of neurobiology, supplement 1. *INT REV NEUROBIOL SUPPL*; 1972 (RECD 1973) 180
- No Oral** Pfeiffer, C. J., Keith, J. C. Jr, and April, M. 1987. topographic localization of gastric lesions and key role of plasma bicarbonate concentration in dogs with experimentally induced gastric dilatation. *American Journal of Veterinary Research* 48(2): 262-7.
- No Oral** PHAM-HUU-CHANH, PHUONG, V. V., KAN, P., and PATTE, J. (study of zinc toxicity on breathing and general metabolism and on systemic hemodynamics of anesthetized dog.). *THERAPIE*; 26 (5). 1971 1049-1058
- FL** Pham-Huu-Chanh, Vo-Van-Phuong, Kan, P., and Patte, J. 1971. [study of the toxic

aggressiveness of zinc on respiration, geneal metabolism and systemic hemodyamics in chloralose treated dogs]. <original> etude de l'agressivite toxique du zinc sur la respiration et le metabolisme general e tsur l'hemodynamique systemique du chien chloralose. *Therapie* 26(5): 1049-58.

- Nut def** Philip, B. and Kurup, P. A. 1978. zinc and metabolism of glycosaminoglycans in normal and atheromatous rats. *Indian Journal of Biochemistry and Biophysics* 14(4): 354-358.
- Nut def** Philip, B., Nampoothiri, V. K., and Kurup, P. A. 1978. zinc and metabolism of lipids in normal and atheromatous rats. *Indian Journal of Experimental Biology* 16(1): 46-50.
- Nut def** Philip, Babu and Kurup, P. A. dietary zinc and levels of collagen, elastin and carbohydrate components of glycoproteins of the aorta, skin and cartilage in rats. *Indian J. Exp. Biol.* (1978) 16(3): 370-2.
- Nut def** Philip, Babu and Kurup, P. A. zinc and metabolism of glycosaminoglycans in normal and atheromatous rats. *Indian J. Biochem. Biophys.* (1977) 14(4): 354-8.
- Nut def** Philip, Babu, Nampoothiri, V. K., and Kurup, P. A. zinc and the metabolism of lipids in normal and atheromatous rats. *Indian J. Exp. Biol.* (1978) 16(1): 46-50 .
- Nut def** Phillippo, M., <Editors> N.F. Suttle, and others. 1983. the role of dose-response trials in predicting trace element deficiency disorders. <document title>trace elements in animal production and veterinary practice. 51-59.
- Carcin** Phillips, Jerry L. and Sheridan, Peter J. effect of zinc administration on the growth of l1210 and bw5147 tumors in mice. *J. Natl. Cancer Inst.* (1976) 57(2): 361-3 .
- Fate** Phillpotts, C. J. 1984. the autoradiographic localisation of retained orally administered cadmium tracer within paneth cells of rat duodenum. *Toxicology* 33(1): 59-66.
- FL** Phuah, C. H. and Hutagalung, R. I. effects of zinc, iron and copper supplementation in cassava-based diets for broiler chickens. *Pertanika* (1980) 3(2): 71-7 .
- Nut def** Phuah, C. H. and Hutagalung, R. I. zinc and iodine supplementation for chickens : effects of zinc and iodine supplementation in the cassava-based diets on performance and body composition of broiler chickens. *Malays. Agric. J.* (1978) 51(3): 311-17 .
- FL** Piasek, Martina, Schonwald, Neala, Blanusa, Maja, Kostial, Krista, and Laskey, John W. biomarkers of heavy metal reproductive effects and interaction with essential elements in experimental studies on female rats. *Arh. Hig. Rada Toksikol.* (1996) 47(3): 245-259.
- Drug** Pick, C. G., Statter, M., Ben Shachar, D., Youdim, M. B., and Yanai, J. 1987. normal zinc and iron concentrations in mice after early exposure to phenobarbital. *International Journal of Developmental Neuroscience* 5(5-6): 391-8.
- No COC** Pick, Chaim G., Statter, Marian, Shachar, Dorit Ben, Youdim, Moussa B. H., and Yanai, Joseph. 1987 . normal zinc and iron concentrations in mice after early exposure to phenobarbital. *Int. J. Dev. Neurosci.* 5(5-6): 391-8 .
- No COC** PICON, L. effect of insulin on growth and biochemical composition of the rat fetus. *ENDOCRINOLOGY* 81:1419-1421,1967
- FL** Piechotta, D. and Kolb, E. 1994. concentrations of sodium, potassium, calcium, magnesium, inorganicphosphate, copper, zinc and alkaline phosphatase in the plasma of catsof different ages. *Tierarztliche Umschau* 49(7): 439-444.

- FL** Pierre, F. Laboratoire de Pathologie Animale Annexe de Bouake Bouake Cote d'Ivoire. 1984. photosensitization in sheep in the interior of the ivory coast skin disease. <original> dermatose de photosensibilisation sur des moutons dans le centre de la cote d'ivoire. *Revue D'Elevage Et De Medecine Veterinaire Des Pays Tropicaux*. V. 37(3) P. 277-285
- Drug** Pierson, E. E., Potter, L. M., and Shelton, J. R. 1979. response from menhaden fish meal in diets of young turkeys. *Poultry Science*. 58 (3): 616-625.
- FL** Pietruszka, B. and Czarnowska-Misztal, E. the effect of dietary zinc deficiency on protein metabolism in experimental animals. *Zywnienie Czlowieka i Metabolizm*. 13 (4). 1986 (Recd. 1987). 283-287.
- FL** Pietruszka, Barbara, Czarnowska-Misztal, Elzbieta, Rutkowska, Urszula, and Kunachowicz, Hanna. utilization of zinc from experimental diets by laboratory rats . part vii. effect of different protein quality and optimal dietary zinc level on the content of protein and nucleic acids in rat liver. *Zywnienie Czlowieka Metab.* (1990) 17(3): 171-80.
- FL** Pietruszka, Barbara, Czarnowska-Misztal, Elzbieta, Rutkowska, Urszula, and Kunachowicz, Hanna. studies on the utilization of zinc from model diets by laboratory rats . part iv. effect of dietary zinc level and protein source on the content of protein and nucleic acids in rat liver. *Zywnienie Czlowieka Metab.* (1987) 14(4): 217-24.
- Diss** Piletz, J. E. 1979. genetic control of two components of murine milk. *Dissertation Abstracts International, B* 40(3): 1032.
- No Oral** Piletz, J. E., Andersen, R. D., Birren, B. W., and Herschman, H. R. 1983 . metallothionein synthesis in foetal, neonatal and maternal rat liver. *European Journal of Biochemistry* 131(3): 489-95.
- Nut def** Piletz, J. E. and Ganschow, R. E. lethal milk mutation results in dietary zinc deficiency in nursing mice. *Am. J. Clin. Nutr.* (1978) 31(4): 560-2.
- No Oral** Piletz, J. E. and Herschman, H. R. 1982. induction of metallothionein by zinc in lethal milk mutant mice. *Biochemical Genetics* 20(11/12): 1221-1233.
- In Vit** Piletz, J. E. and Herschman, H. R. 1987. metallothionein synthesis and mrna levels in cultured hepatocytes from lethal milk mutant mice. *Journal of Nutrition* 117(1): 183-188.
- Alt** Piletz, J. E., Lonnerdal, B., Hurley, L. S., Berry, W., Ganschow, R. E., and Herschman, H. R. 1987. zinc and copper in milk and tissues of nursing lethal milk mutant mice. *The Journal Of Nutrition*. 117(1): 83-90.
- Nut def** Piletz, John E. and Ganschow, Roger E. zinc deficiency in murine milk underlies expression of the lethal milk (lm) mutation. *Science* (1978) 199(4325): 181-3 .
- No Oral** Piletz, John E. and Herschman, Harvey R. induction of metallothionein by zinc in lethal milk mutant mice. *Biochem. Genet.* (1982) 20(11-12): 1221-33.
- In Vit** Piletz, John E. and Herschman, Harvey R. metallothionein synthesis and mrna levels in cultured hepatocytes from lethal milk mutant mice. *J. Nutr.* (1987) 117(1): 183-8.
- Nut def** Piletz, John E., Lonnerdal, Bo, Hurley, Lucille S., Berry, Wade, Ganschow, Roger E., and Herschman, Harvey R. zinc and copper in milk and tissues of nursing lethal milk mutant mice. *J. Nutr.* (1987) 117(1): 83-90.

- Nut** Piliang, W. G., Bird, H. R., Sunde, M. L., and Pringle, D. J. 1984. rice bran as the major energy source of laying hens. *Poultry Adviser* 17(6): 21-31.
- FL** Piliang, W. G. and Manalu, W. Institut Pertanian Bogor Indonesia Fakultas Peternakan. 1988. effect of different levels of zinc supplementation in rice bran diets on zinc status and on the performance of laying hens. [proceedings of the second national seminar on animal husbandry and farmers forum]. <original> proceedings seminar nasional peternakan dan forum peternak "unggas dan aneka ternak" ke dua. P. 125-134
- FL** Pilipili, C. M., Demars-Fremault, C., and Dhem, A. 1993. [chemical and traumatic irritation of a canine premolar tooth germ]. <original> irritations chimique et traumatique d'un germe de premolaire de chien. *Schweizer Monatsschrift Fur Zahnmedizin* 103(12): 1558-63.
- Nut def** Pillay, D., Gathiram, P., and Ubbink, J. B. zinc status in vitamin b6 deficiency. *Int. J. Vitam. Nutr. Res.* (1997) 67(1): 22-26
- BioX** Pilon Andre A and Mes-Masson Anne-Marie(A). 1996. polyomavirus large t antigen zinc finger is not required for efficient cellular immortalization of primary rat embryo fibroblasts. *Virus Research* 46(1-2): 171-175.
- CP** Pimentel, J. L. and Cook, M. E. influence of zinc deficiency on the immune responses of the chick. *77TH ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC. POULT SCI.* 67 (Suppl. 1). 1988. 139.
- Nut** Pimentel, J. L., Cook, M. E., and Greger, J. L. 1991. immune response of chicks fed various levels of zinc. *Poult. Sci.* 70(4): 947-54 .
- Org Met** Pimentel, J. L., Cook, M. E., and Greger, J. L. 1991. research note: bioavailability of zinc-methionine for chicks. *Poult. Sci.* 70(7): 1637-9 .
- Unrel** Pina, C., Torres, C. K., and Guzman, J. preliminary histological study of connective tissue response to zinalco and stainless steel 316l implants after 120 days. *J. Mater. Sci.: Mater. Med.* (1998) 9(2): 93-97.
- Mineral** Pinchak, W. E., Greene, L. W., and Hunt, L. J. 1990. biases in relative estimates of dietary mineral status from esophagealextrusa. *Journal of Range Management* 43(2): 136-138.
- Alt** Pinchak, W. E., Greene, L. W., and Hunt, L. J. 1989. mineral composition of esophageal fistula extrusa. <document title> beef cattle research in texas, 1988. 292-296.
- Drug** Pinelli, A. and Trivulzio, S. antiprostatic effect associated with zinc depletion in cimetidine-treated rats. *Pharmacol. Res. Commun.* (1988) 20(4): 329-35 .
- Drug** Pinelli, P., Trivulzio, S., Colombo, R., Cocchi, D., Faravelli, R., Caviezel, F., Galmozzi, G., and Cavallaro, R. 1987. antiprostatic effect of cimetidine in rats. *Agents and Actions* 22(3-4): 197-201.
- CP** Pingel, H., Anke, M., Salchert, E. Leipzig Univ. Germany Dep. of Poultry and Small Animal Science, and Skrede, A. ed. 1992. the influence of zinc supplementation on growth and reproduction of mink. progress in fur animal science. proceedings from the vth international scientific congress in fur animal production. P. 321-325. No. 9(Suppl.)
- Nut** Pinion, J. L., Bilgili, S. F., and Hess, J. B. 1995. the effects of halofuginone and salinomycin, alone and in combination, on live performance and skin characteristics of female broilers: influence of a high-proline diet supplemented with ascorbic acid and zinc. *Poult. Sci.* 74(2):

383-90 .

- Abstract** Pinion, J. L., Bilgili, S. F., and Hess, J. B. 1994. skin characteristics of female broilers fed halofuginone and salinomycin: influence of a high proline diet, supplemented with ascorbic acid and zinc. *Poultry Science* 73(SUPPL. 1): 155.
- Bio Acc** Pinowski, J., Pinowska, B., Krasnicki, K., and Tomek, T. 1983. chemical composition during growth in nestling rooks *corvus-frugilegus*. *ORNIS SCAND.* 14(4): 289-298.
- Aquatic** Pinuela, C., Baatrup, E., and Geneser, F. A. 1992. histochemical distribution of zinc in the brain of the rainbow trout, *oncorhynchus myciss*. ii. the diencephalon. *Anatomy and Embryology* 186(3): 275-84.
- Gene** Pio Frederic, Ni Chao-Zhou, Mitchell Richard S, Knight John, Mckercher Scott, Klemzsz Michael, Lombardo Angela, Maki Richard A, and Ely Kathryn R= (A). 1995. co-crystallization of an ets domain (pu.1) in complex with dna. engineering the length of both protein and oligonucleotide. *Journal of Biological Chemistry* 270(41): 24258-24263 .
- Abstract** Piper, E. L. and Spears, J. W. influence of copper and zinc supplementation on mineral status growth and reproductive performance of heifers. *ANNUAL MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE AND CANADIAN SOCIETY OF ANIMAL SCIENCE, ONTARIO, AUG. 8-11, 1982. J ANIM SCI.* 55 (Suppl. 1). 1982 (Recd. 1983). 319.
- Bio Acc** Pironi, L., Miglioli, M., Cornia, G. L., Ursitti, M. A., Tolomelli, M., Piazzzi, S., and Barbara, L. 1987. urinary zinc excretion in crohns-disease. *Digestive Diseases And Sciences* 32(4): 358-362.
- FL** Pisa, J. and Cibulka, J. 1989. cd, pb, hg, cu, and zn content in hair and cervical mucus in cattlekept in industrial area in czechoslovakia. *Ekologia, CSSR* 8(4): 421-432.
- FL** Pisarski, R. K. 1988. effect of the amount and kind of protein and of energy value of the diet on the amount of some mineral components in the blood plasma of broiler chickens. *Roczniki Nauk Rolniczych. Seria B, Zootechniczna* 104(3): 105-115.
- FL** Pisarski, R. K. Akademia Rolnicza Lublin Poland Inst. Zywienia i Higieny Zwierzat. 1988. [effect of dietary protein and energy level on plasma mineral content in broiler chicken]. <original> wpływ zawartosci i rodzaju bialka oraz wartosci energetycznej paszy na poziom niektórych skladnikow mineralnych w osoczu krwi kurczat rzeznnych. *Roczniki Nauk Rolniczych. Seria B - Zootechniczna.* <Subtitle>Polish Agricultural Annual. Seria B - Animal Science. V. 104(3) P. 105-115
- Unrel** Pitt Ford, T. R., Andreasen, J. O., Dorn, S. O., and Kariyawasam, S. P. 1994. effect of irm root end fillings on healing after replantation. *Journal of Endodontics* 20(8): 381-5.
- Unrel** Pitt Ford, T. R., Andreasen, J. O., Dorn, S. O., and Kariyawasam, S. P. 1996. effect of various sealers with gutta-percha as root-end fillings on healing after replantation. *Endodontics & Dental Traumatology* 12(1): 33-7.
- Unrel** Pitt Ford, T. R., Andreasen, J. O., Dorn, S. O., and Kariyawasam, S. P. 1995. effect of various zinc oxide materials as root-end fillings on healing after replantation. *International Endodontic Journal* 28(6): 273-8.
- Unrel** Pitt Ford, T. R. and Roberts, G. J. 1991. immediate and delayed direct pulp capping with the use of a new visible light-cured calcium hydroxide preparation. *Oral Surgery, Oral Medicine, and Oral Pathology* 71(3): 338-42.

- Prim** Pitt Ford, T. R. and Rowe, A. H. 1989. a new root canal sealer based on calcium hydroxide. *Journal of Endodontics* 15(7): 286-9.
- Nut def** Pitt, J. A. chemical- or dietary-induced maternal zinc deficiency and developmental toxicity in the new zealand white rabbit. *Diss Abstr Int Sci* 1997 Aug;58(2):664B
- Nut def** Pitt, Jeffrey A. 1997. chemical- or dietary -induced maternal zinc deficiency and developmental toxicity in the new zealand white rabbit (lipopolysaccharide). Avail.: UMI. Order No. DA9722064 From: *Diss. Abstr. Int., B* 1997, 58. 2. 664. 180 pp.
- Nut def** Pitt, Jeffrey A., Zoellner, Michael J., and Carney, Edward W. developmental toxicity of dietary zinc deficiency in new zealand white rabbits. *Reprod. Toxicol.* (1997) 11(6): 781-789
- FL** Pivniak, I. G. and Koniakhin, A. N. 1970. [effect of zinc-bacitracin on the chick organism]. <original> vliianie tsinkbatsitratsina na organizm tsypliat. *Veterinariia* 2: 69-70.
- FL** Pivont, P., Antoine, H., and Gregoire, R. 1982. rapid diagnostic tests for hypogammaglobulinaemia in the newborn calf: comparison and developments. *Annales De Medecine Veterinaire* 126(8): 621-628.
- No COC** Planas-Bohne, F., Gabard, B., and Schaffer, E. H. 1980. toxicological studies on sodium 2,3-dimercaptopropane-1-sulfonate in the rat. *Arzneimittel-Forschung* 30(8): 1291-4.
- CP** PLANAS-BOHNE, F. and LOHBREIER, J. toxicological studies on dtpa. *DIAGN TREAT INC RADIONUCLIDES PROC INT SEMIN* 1975 505-515,1976
- Nut def** Planells, Elena, Aranda, Pilar, Lerma, Ana, and Llopis, Juan. changes in bioavailability and tissue distribution of zinc caused by magnesium deficiency in rats. *Br. J. Nutr.* (1994) 72(2): 315-23
- No Dose** Platt, S. R. and Clydesdale, F. M. 1985. binding of iron by lignin in the presence of various concentrations of calcium, magnesium, and zinc. *Journal Of Food Science* 50(5): 1322-1326.
- CP** Plech Andrzej(A), Jedrusiak Iwona(A), Jakrzewska Halina(A), Brus Ryszard(A), Rzeszotarska Barbara, and Masiukiewicz Elzbieta. 1992. central effects of zinc complex of gonadoliberin (lh-rh) in rats. *Polish Journal of Pharmacology and Pharmacy* 44(SUPPL.): 205.
- FL** Pleva, J., Cabadaj, R., Mate, D., Bires, J. , and Korimova, L. the role of vitamin a and ascorbic acid in accumulation of zinc in hen tissues. *Folia Vet.* (1994) 38(1-2): 41-4 .
- Drug** Pleva, J., Cabadaj, R., Mate, D., and Nagy, J. zinc in prevention of poultry stress. *Folia Vet.* (1992) 36(1-2): 79-89.
- CP** Plonka, P. M(A), Handjiski, B., Plonka, B. K(A), and Paus, R. 1997. ambivalent effects of oral zinc on normal and dystrophic murine hair growth and pigmentation. *Journal of Investigative Dermatology* 108(4): 652.
- Unrel** Plonka, S., Kolat, S., and Paschma, J. growth rate feed conversion and carcass traits in growing finishing pigs fed the complete feed mixture supplemented with zinc bacitracin vitamycin and grisein. *ROCZ NAUK ZOOTECH. Roczniki Naukowe Zootechniki.* 7 (2). 1980 (Recd. 1981). 241-248.
- No COC** Plus, R. 1992. a review of in-vivo studies of porphyrins and unexpected fluorescences an interpretation of the results. *Medical Hypotheses.* 37 (1): 49-57.
- No COC** Poche, R. M. and Mian M. Y. 1986. effectiveness of four rodenticides in deepwater rice.

Z. Angew. Zool. 73(1): 37-48.

- No COC** Pocker, Y. and Fong, C. T. O. kinetics of inactivation of erythrocyte carbonic anhydrase by sodium 2,6-pyridine dicarboxylate. *Biochemistry*. 19 (10). 1980. 2045-2050.
- In Vit** Pocker, Y. and Sarkanen, S. oxonase and esterase activities of erythrocyte carbonic anhydrase. *Biochemistry*. 17 (6). 1978 1110-1118.
- Org Met** Pogorelova, G. V. and Zhegunov, G. F. 1994. a study of isoenzymatic spectra of Cu,Zn-superoxide dismutase in hibernating mammals *Citellus undulatus* in the time course of hibernation. *Problemy Kriobiologii* 0(4): 53-54.
- No Oral** Pohle, W. and Rauca, C. 1994. hypoxia protects against the neurotoxicity of kainic acid. *Brain Research* 644(2): 297-304.
- No COC** Polasek, L., Bauer, B., and Tejnora, J. 1975. effects and optimal amounts of the non-antibiotic stimulant Czechoslovak nitrovin for fattening turkeys. *Biologizace a Chemizace Vyzivy Zvirat* 11(1): 33-48.
- Prim** Polberger, S., Fletcher, M. P., Graham, T. W., Vruwink, K., Gershwin, M. E., and Lonnerdal, B. 1996. effect of formula zinc and iron level on zinc absorption, zinc status, and immune function in infant rhesus monkeys. *Journal of Pediatric Gastroenterology and Nutrition* 22(2): 134-143.
- Prim** Polberger, S., Fletcher, M. P., Graham, T. W., Vruwink, K., Gershwin, M. E., and Lonnerdal, B. 1996. effect of infant formula zinc and iron level on zinc absorption, zinc status, and immune function in infant rhesus monkeys. *Journal of Pediatric Gastroenterology and Nutrition* 22(2): 134-43.
- FL** Poletaeva, I. I. 1986. food search by mice during extrapolation problem-solving after zinc induced anosmia. *Zhurnal Vysshei Nervnoi Deyatel'nosti Imeni I P Pavlova* 36(4): 680-685.
- FL** Poletaeva, I. I. food search by mice during the solving of extrapolation task after zinc induced anosmia. *Zhurnal Vysshei Nervnoi Deyatel'nosti Imeni I P Pavlova*. 36 (4). 1986. 680-685.
- FL** Poletaeva, I. I. 1986. [food search by mice solving an extrapolation problem after suppression of smell by zinc sulfate]. <original> poisk pishchi myshami pri reshenii zadachi na ekstrapoliatsiiu posle vykliucheniia obonianiia sul'fatom tsinka. *Zhurnal Vysshei Nervnoi Deyatel'nosti Imeni I P Pavlova* 36(4): 680-5.
- CP** Polimeni, M., Giorgi, S., Molinaro, M., Cossu, G., and Bouche, M. 1993. characterization of new zinc finger coding genes which are upregulated during mouse satellite cell differentiation. *Molecular Biology of the Cell* 4(SUPPL.): 78A.
- No COC** Poling, J. S., Karanian, J. W., Salem, N. Jr, and Vicini, S. 1995. time- and voltage-dependent block of delayed rectifier potassium channels by docosahexaenoic acid. *Molecular Pharmacology* 47(2): 381-90.
- Phys** Poling, J. S., Vicini, S., Rogawski, M. A., and Salem, N. Jr. 1996. docosahexaenoic acid block of neuronal voltage-gated K⁺ channels: subunit selective antagonism by zinc. *Neuropharmacology* 35(7): 969-82.
- Rev** Pollack, S. V. 1982. wound healing: a review. iv. systemic medications affecting wound healing. *Journal of Dermatologic Surgery and Oncology* 8(8): 667-72.
- Alt** Pollard, H., Guilhem, D., Moreau, J., Suzuki, F., and Onteniente, B. 1994. decreased

pentylenetetrazol-induced expression of zif/268 in ngf-transgenic mice. *Neuroreport* 5(17): 2246-8.

- FL** Polyakov, A. A. and Kupeshev, T. Sh. 1983. survival of the agent of chlamydial abortion of ewes, and disinfection regimes. *Veterinariya, Moscow, USSR* (No.7): 24-26.
- No Dose** POMERANTSEVA, M. D., RAMAIYA, L. K., and VILKINA, G. A. comparative efficacy of different tests for determining the mutagenicity of certain factors in mammals 2. frequency of abnormal sperm heads in mice exposed to various factors. *SOV GENET (ENGL TRANSL GENETIKA)*; 16 (8). 1980 (1981). 892-895.
- Gene** POMERANTSEVA, M. D. and RAMAYA, L. K. efficiency of the abnormal sperm head test in detecting mutagenicity of different factors in mice. *MUTAT RES* 74:233,1980
- Nut** Pomorski, Z. J. H. 1995. diet-related skin diseases. *Magazyn Weterynaryjny* 4(3): 186-191.
- Phys** Pomp, D., Oberbauer, A. M., and Murray, J. D. 1996. development of obesity following inactivation of a growth hormone transgene in mice. *Vol. 5, No. 1, Pp. 13-23* Transgen. Res.
- Nut def** Pond, W. G. 1983. effect of dietary calcium and zinc levels on weight gain and blood and tissue mineral concentrations of growing columbia- and suffolk-sired lambs. *Journal of Animal Science* 56(4): 952-959.
- Unrel** Pond, W. G., Krook, L. P., and Klevay, L. M. 1990. bone pathology without cardiovascular lesions in pigs fed high zinc and low copper diet. *Nutrition Research* 10(8): 871-885.
- Nut** Pond, W. G. and Oltjen, R. R. response of large and medium frame beef steers to protein and zinc supplementation of a corn silage-corn finishing diet. *Nutrition Reports International*. 38 (4). 1988. 737-744.
- CP** Pond, W. G. and Walker, E. F. Jr. 1975. effect of dietary ca and cd level of pregnant rats on reproduction and on dam and progeny tissue mineral concentrations. *Proceedings of the Society for Experimental Biology and Medicine*; 148
- Nut** Pond, W G, Walker, E F Jr, Kirtland, D, and Rounsaville, T. 1978. effect of dietary ca, cu and zn [calcium, copper, zinc] level on body weight gain and tissue mineral concentrations of growing pigs and rats. *J Anim Sci* 47 (5): 1128-1134.
- Nut def** Pond, W. G., Walker, E. F. Jr., Kirtland, D., and Rounsaville, T. effect of dietary calcium, copper, and zinc level on body weight gain and tissue mineral concentrations of growing pigs and rats. *J. Anim. Sci. (1978)* 47(5): 1128-34 .
- Nut** Pond, W. G. and Wallace, M. H. 1986. effect of gestation-lactation diet calcium and zinc levels and of parenteral vitamins a, d and e during gestation on ewe body weight and on lamb weight and survival. *J Anim Sci.* 63(4): 1019-25.
- No COC** Pond, W. G. and Yen, J. T. effect of dietary calcium and iron level on weight gain and on blood and tissue mineral concentrations in cross bred growing finishing swine. *Nutrition Reports International*. 21 (1). 1980. 127-134.
- Nut** Pond, W. G. and Yen, J. T. 1984. effect of level of alfalfa meal in a corn-soybean meal diet on growing-finishing swine. *Nutrition Reports International* 29(5): 1191-1201.
- Nut def** Pond, W. G. and Yen, J. T. 1984. effect of protein deficiency on growth and plasma zinc concentration in genetically lean and obese swine. *Journal of Animal Science* 59(3): 710-716.

- Nut** Pond, W. G., Yen, J. T., and Yen, L. H. 1985. effect of dietary protein and zinc levels on weight gain and plasmatraits in weanling pigs. *Nutrition Reports International* 31(2): 253-264.
- Unrel** Pond, W. G., Young, L. D., Krook, L., and Wallace, M. Meat Anim. Res. Center Univ. Clay Center Nebraska 68933 USA. 1984. thoracic limb defect in sheep. *Veterinary Record*. V. 114(10) P. 247
- CP** Poore, M. H., Mccraw, R. L., Allison, B. C., and Spears, J. W. sustained-release selenium boluses and zinc methionine trace mineralized salt blocks for stocker cattle. *MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE AND INTERNATIONAL SOCIETY OF APPLIED ETHOLOGY, PITTSBURGH, PENNSYLVANIA, USA, AUGUST 8-11, 1992. J ANIM SCI.* 70 (Suppl. 1). 1992. 301.
- FL** Popa, O., Mosolova, L., Salajan, G., Dankanits, V., and Jurca, I. 1980. zinc supplements for meat chickens. *Buletinul Institutului Agronomic Cluj-Napoca, Zootehnie Si Medicina Veterinara* 34: 127-130.
- FL** Popa, O., Mosolova, L., Salajan, Gh., Dankanits, V., and Jurca, I. <translated> experimental results on zinc supplementation in broiler chickens diet. rezultate experimentale privind adaosul de zine in premixul puilor de carne. *Buletinul Institutuli Agronomic Cluj-Napoca*. 1980 (pub. 1981). v. 34. p. 127-130.
- Mix** Popescu, V. 1997. copper influence of the acute toxicity of several salts of cadmium,mercury and zinc. *Studies and Researches in Veterinary Medicine* 5: 73-77.
- Phys** Popov, B. and Kaczmarek, L. 1994. antibody raised to the short sequence from the zinc-finger domain of the egr-1 recognizes 102 kd protein in mouse fibroblasts. *Biochemistry and Molecular Biology International* 32(1): 39-47.
- CP** Popov, B. V. and Besel, V. S. 1978. mathematical model of zinc metabolism in rat . imitation of zinc deficient and zinc excessive diets. *Trace Elem. Metab. Man Anim. Proc. Int. Symp., 3rd* : Meeting Date 1977, 168-70. Editor(s): Kirchgessner, M. Publisher: Arbeitskreis Tierernaehrungsforschung Weihenstephan Inst. Ernaehrungsphysiol., Freising-Weihenstephan, Ger..
- FL** Popov, B. V. and Bezel, V. S. 1976. mathematical model of zinc metabolism in animals. *Tr. Inst. Ekol. Rast. Zhivotn. Ural. Nauchn. Tsentr, Akad. Nauk SSSR* 103: 109-18
- FL** Popov, B. V. and Kaczmarek, L. 1994. [the antibodies obtained by immunization with a peptide identical to a section of the zinc-binding domain of the early growth response 1 factor (egr-1) interact with a 102-kda protein from mouse fibroblasts]. <original> antitela, poluchennye immunizatsiei peptidom, identichnym uchastku tsinksviazyvaiushchego domena faktora rannego rostovogo otveta 1 (egr-1), vzaimodeistvuiut s belkom 102 kda fibroblastov myshi. *Tsitologiya* 36(5): 453-8.
- FL** Popov, D., Sljivovacki, K., Stankovic, N., Pavicevic, P., and Pacerku, K. 1987. effects of vitamin a and zinc levels in meal on the utilization of foodand yield in piglets. *Veterinarski Glasnik* 41(9): 671-678.
- FL** Popovic, Z. Naucni institut za reprodukciju i v. o. Temerin Yugoslavia, Sinovec, Z., Vukic-Vranjes, M., Veselinovic, S., Ivkov, O., Cupic, Z., and Iliskovic, V. 1998. organic-bound microelements and live cells of yeast (saccharomyces cerevisiae) in diet of dairy cows. <original> organski vezani mikroelementi i zive celije kvasca (saccharomyces cerevisiae) u ishrani muznih krava. *Veterinarski Glasnik*. V. 52(7-8) P. 385-394

- No Oral** Pories, Walter J. East Carolina Univ, Van, Rij Andre M., and Bray, John T. does zinc cause cancer? *Univ of Mo Trace Subst in Environ Health 12th Conf, Columbia*. P164(6)
- Nut** Porter, L. P., Borgman, R. F., and Lightsey, S. F. 1988. effects of water hardness upon lipid and mineral metabolism in rabbits. *Nutrition Research* 8(1): 31-45.
- OAC** Porter, Linda P., Borgman, Robert F., and Lightsey, Stephen F. effects of water hardness upon lipid and mineral metabolism in rabbits. *Nutr. Res. (N. Y.) (1988)* 8(1): 31-45.
- No Oral** Porter, R. H., Sentell, S. W., and Makin, J. W. effects of intranasal zinc sulfate irrigation are mitigated by the presence of untreated littermates. *Physiology & Behavior*. 40 (1). 1987. 97-102.
- No Oral** Porter, R. H., Sentell, S. W., and Makin, J. W. 1987. effects of intranasal znso4 irrigation are mitigated by the presence of untreated littermates. *Physiology & Behavior* 40(1): 97-102.
- FL** Posielezna, Barbara, Drozd, Marian, and Jendryczko, Andrzej. protective effect of sodium selenite on liver inflammatory state of rats intoxicated with nitroso-alpha-naphthol. part ii. erythrocyte and liver copper and zinc content and sodium selenite metabolism. *Bromatol. Chem. Toksykol. (1993)* 26(4): 267-70.
- Nut def** Potier de Courcy, Genevieve, Susbielle, Henriette, Terroine, Therese, and Desmettre-Miguet, Sylvie. study of zinc during ariboflavinosis teratogenesis in rats. *Arch. Sci. Physiol. (1970)* 24(4): 409-17.
- Drug** Potter, L. M., Shelton, J. R., and Pierson, E. E. menhaden fish meal dried fish solubles methionine and zinc bacitracin in diets of young turkeys. *Poultry Science*. 56 (4). 1977 1189-1200.
- Gene** Pountney, Dean L., Fundel, Sibylle M., Faller, Peter, Birchler, Neil E., Hunziker, Peter, and Vasak, Milan. isolation, primary structures and metal binding properties of neuronal growth inhibitory factor (gif) from bovine and equine brain. *FEBS Lett. (1994)* 345(2-3): 193-7 .
- In Vit** Pountney, Dean L. and Vasak, Milan. spectroscopic studies on metal distribution in cobalt(ii)/zinc(ii) mixed-metal clusters in rabbit liver metallothionein 2. *Eur. J. Biochem. (1992)* 209(1): 335-41.
- Rev** Powanda, M. C. 1980. host metabolic alterations during inflammatory stress as related to nutritional status. *American Journal of Veterinary Research* 41(11): 1905-11.
- Bact** Powanda, M. C., Cockerell, G. L., Moe, J. B., Abeles, F. B., Pekarek, R. S., and Canonico, P. G. 1975. induced metabolic sequelae of tularemia in the rat: correlation with tissue damage. *American Journal of Physiology* 229(2): 479-83.
- QAC** Powanda, M. C., Machotka, S. V., and Kishimoto, R. A. 1977. *Metabolic Sequelae of Respiratory Q Fever in the Guinea Pig*. <NOTE> Interim Rept
- Abstract** Powanda, M. C. and Sobocinski, P. Z. 1975. systemic metabolic consequences of phagocytosis. *Journal of Cell Biology*. 67((2 Part 2)): 343a.
- No COC** Powanda, Michael C., Blackburn, Billy S., Bostian, Karen A., Fowler, John P., Hauer, Edward C., and Pekarek, Robert S. clofibrate-induced alterations in zinc, iron and copper metabolism. *Biochem. Pharmacol. (1978)* 27(1): 125-7 .
- Bact** Powanda, Michael C., Cockerell, Gary L., Moe, James B., Abeles, Fred B., Pekarek, Robert S., and Canonico, Peter G. induced metabolic sequelae of tularemia in the rat . correlation with

tissue damage. *Am. J. Physiol.* (1975) 229(2): 479-83 .

- Alt** Powanda, Michael C., Villarreal, Ysidro, Rodriguez, Elisandro Jr., Braxton, Guy III, and Kennedy, Calvin R. redistribution of zinc within burned and burned infected rats. *Proc. Soc. Exp. Biol. Med.* (1980) 163(3): 296-301.
- Mineral** Powell, J. J., Whitehead, M. W., Ainley, C. C., Kendall, M. D., Nicholson, J. K., and Thompson, R. P. 1999. dietary minerals in the gastrointestinal tract: hydroxypolymerisation of aluminium is regulated by luminal mucins. *Journal of Inorganic Biochemistry* 75(3): 167-80.
- Alt** Powell, Saul, Saltman, Paul, Uretzky, Gideon, and Chevion, Mordechai. the effect of zinc on reperfusion arrhythmias in the isolated perfused rat heart. *Free Radical Biol. Med.* (1990) 8(1): 33-46 .
- CP** Powell Saul R(A), Wahezi Saved E(A), and Maulik Dev(A). 2000. the effect of in utero hypoxia on fetal heart and brain trace metals. *Pediatric Research* 47(4 Part 2): 295A.
- Abstract** Power R(A), Flynn, A., and Cashman, K. 1994. tissue deposition of zinc from a zinc chelate and from inorganic zinc in rats. *Animal Production* 58(3): 470.
- No Tox** Powers, J. B. and Winans, S. S. 1975. vomeronasal organ: critical role in mediating sexual behavior of the male hamster. *Science* 187(4180): 961-3.
- No COC** Powers Robert W, Chambers Carolyn, and Larsen William J(A). 1996. diabetes-mediated decreases in ovarian superoxide dismutase activity are related to blood-follicle barrier and ovulation defects. *Endocrinology* 137(7): 3101-3110.
- IMM** Powis, G. and Kovach, J. S. 1981. binding of copper and zinc by the antitumour agent l-alanosine. *Biochemical Pharmacology* 30(7): 771-6.
- CP** Prabhakar, N. R., Dinerman, J. L., Agani, F. H., and Snyder, S. H. 1995. carbon monoxide: a role in carotid body chemoreception. *Proceedings of the National Academy of Sciences of the United States of*
- Bact** Prahalad, A. K. and Seenayya, G. 1988. bioavailability of zinc and cadmium and their effect on microbial-growth and metal uptake. *Bulletin Of Environmental Contamination And Toxicology* 41(6): 921-927.
- Nut def** Praharaaj, N. K., Rao, S. V. R., Raju, M. V. L. N., Chawak, M. M., Mishra, S. K., and Mohapatra, S. C. 1994. combined feeding of zinc, iodine and salt-free diet for inducing moultand its effect on subsequent performance of layer. *Indian Journal of Poultry Science* 29(2): 142-145.
- Surv** Prahlad Singh and Gupta, P. C. 1978. studies on soil-plant-animal relationship of zinc in buffaloes ofharyana region. *Indian Journal of Animal Sciences* 48(11): 816-820.
- FL** Prakash, I. and Ojha, P. the phenomenon of poison bait aversion and its possible attenuation in the indian gerbil tatera-indica-indica. *Zeitschrift Fuer Angewandte Zoologie.* 65 (4). 1978 (Recd. 1979). 385-396.
- No COC** Prakash, I. and Mathur R. P. 1992. acute rodenticides. *Rodents in Indian Agriculture.* 1: 497-515.
- HHE** Prasad, A. S. 1983. clinical, biochemical and nutritional spectrum of zinc-deficiency in human-subjects - an update. *Nutrition Reviews* 41(7): 197-208.

- Nut def** Prasad, A. S. 1985. clinical manifestations of zinc-deficiency. *Annual Review Of Nutrition* 5: 341-365.
- HHE** Prasad, A. S. 1984. discovery and importance of zinc in human-nutrition. *Federation Proceedings* 43(13): 2829-2834.
- Rev** Prasad, A. S. 1983. the role of zinc in gastrointestinal and liver-disease. *Clinics In Gastroenterology* 12(3): 713-741.
- HHE** Prasad, A. S. 1988. zinc in growth and development and spectrum of human zinc-deficiency. *Journal Of The American College Of Nutrition* 7(5): 377-384.
- HHE** Prasad, A. S., Meftah, S., Abdallah, J., Kaplan, J., Brewer, G. J., Bach, J. F., and Dardenne, M. 1988. serum thymulin in human zinc-deficiency. *Journal Of Clinical Investigation* 82(4): 1202-1210.
- Nut def** Prasad, A. S. and Oberleas, D. dna synthesis and thymidine kinase in zinc deficient tissue. *J CLIN INVEST. Journal of Clinical Investigation*. 52 (6). 1973 66
- Abstract** Prasad, A. S. and Oberleas, D. effect of zinc on thymidine kinase and dna synthesis. *CLIN RES. Clinical Research*. 21 (4). 1973 888
- Nut def** Prasad, A. S. and Oberleas, D. 1974. thymidine kinase activity and incorporation of thymidine into dna in zinc-deficient tissue. *Journal of Laboratory and Clinical Medicine* 83(4): 634-9.
- Nut def** Prasad, A. S., Oberleas, D., Koniuch, D., and DuMouchelle, E. 1973. ribonuclease and deoxyribonuclease activities in zinc-deficient tissues. *Journal of Laboratory and Clinical Medicine* 82(3): 461-466.
- Abstract** Prasad, A. S., Oberleas, D., Miller, E. R., and Luekce, R. W. biochemical effects of zinc deficiency. *Journal of Clinical Investigation*. 49 (6). 1970 76a
- Nut def** Prasad, Ananda S. 1967. nutritional metabolic role of zinc. *Fed. Proc. Fed. Am. Soc. Exp. Biol.* 26(1): 172-85 .
- Nut def** Prasad, Ananda S., Oberleas, Donald, Koniuch, Daria, and DuMouchelle, Elizabeth. ribonuclease and deoxyribonuclease activities in zinc-deficient tissues . *J. Lab. Clin. Med. (1973)* 82(3): 461-6.
- Nut def** Prasad, Ananda S., Oberleas, Donald, Wolf, Paul, Horwitz, Jerome P., Collins, Ray, and Von der Muehl, Elizabeth. effect of growth hormone on nonhypophysectomized zinc-deficient rats and [effect of] zinc on hypophysectomized rats. *J. Lab. Clin. Med. (1969)* 73(3): 486-94.
- Nut def** Prasad, C. S. and Arora, S. P. 1979. influence of dietary zinc on .beta.-carotene conversion and on the level of retinol binding protein in the blood serum. *Indian J. Dairy Sci.* 32(3): 275-9 .
- BioX** Prasad, J. 1989. a note on toxic effects of leucaena leucocephala in goats: a clinical study. *Indian Journal of Veterinary Medicine* 9(2): 151-152.
- Nut def** Prasad, J. and Ramachandra, K. S. clinico-pathological changes in calves suffering from alopecia . *Indian Journal of Veterinary Medicine*. 7 (1). 1987. 23-26.
- Carcin** Prasad, Kedar N., Ahrens, Charles R., and Barrett, Judith M. homeostasis of zinc and iron in mouse b16 melanoma. *Cancer Res. (1969)* 29(5): 1019-23 .

- Prim** Prasad, R., Paliwal, V. K., Sharma, N., and Nath, R. effect of cadmium administration on calcium and zinc transport in monkey intestinal and renal brush border membrane vesicles subjected to calcium deficiency. *Heavy Met. Environ. Int. Conf.*, 4th (1983): Volume 1, 561-6 Publisher: CEP Consult., Edinburgh, UK..
- CP** Prasad, A. S. 1967. trace elements in nutrition. nutritional metabolic role of zinc. *Federation Proceedings* 26(1): 172-85.
- OAC** Prattley, C. A., Stanley, D. W., Smith, T. K., and Van de Voort, F. R. protein-phytate interaction in soybeans. iii. the effect of protein-phytate complexes on zinc bioavailability. *J. Food Biochem.* (1982) 6(4): 273-82 .
- Nut** Prattley, C. A., Stanley, D. W., Smith, T. K., and Voort, F. R. van de. 1982. protein-phytate interaction in soybeans. iii. the effect of protein-phytate complexes on zinc bioavailability. *Journal of Food Biochemistry* 6(4): 273-282.
- Unrel** Preece, G., Murphy, G., and Ager, A. 1996. metalloproteinase-mediated regulation of l-selectin levels on leucocytes. *Journal of Biological Chemistry* 271(20): 11634-40 .
- No Oral** Preece, Nicholas E., Hall, Derek E., Howarth, Julie A., King, Laurence J., and Parke, Dennis V. effects of acute and sub-chronic administration of iron nitrilotriacetate in the rat. *Toxicology* (1989) 59(1): 37-58 .
- Mineral** Preedy, Victor R., Baldwin, Dianne R., Keating, James W., and Salisbury, Jonathan R. bone collagen, mineral and trace element composition, histomorphometry and urinary hydroxyproline excretion in chronically treated alcohol-fed rats. *Alcohol Alcohol.* (1991) 26(1): 39-46.
- Carcin** Preiss, I. L. and Keenan, J. F. 1988. time dependent zinc distribution in the development of the bw7756 murine hepatoma. *International Journal of Radiation Applications and Instrumentation*.
- FL** Prescott, J. F., Sivendra, R., and Barnum, D. A. 1978. the use of bacitracin in the prevention and treatment of experimentally-induced necrotic enteritis in the chicken. *Canadian Veterinary Journal* 19(7): 181-183.
- Nut** Preston, R. L. 1983. typical composition of feeds for cattle and sheep. *Feedstuffs* 55(36): 16...21.
- Nut** Price, J. and Humphries, W. R. 1980. investigation of the effect of supplementary zinc on growth rate of beef cattle on farms in n, scotland. *Journal of Agricultural Sciences, UK* 95(1): 135-139.
- Nut def** Price, J. and Wood, D. A. 1982. zinc responsive parakeratosis and ill-thrift in a friesian calf. *Veterinary Record* 110(20): 478.
- No COC** Price, K. R., Southon, S., and Fenwick, G. R. the effect of saponins on iron and zinc availability. *Spec. Publ. - R. Soc. Chem.* (1989) 72(Nutr. Availability: Chem. Biol. Aspects): 155-7 .
- FL** Prigozhina, S. M., Kist, A. A., and Lobanov, E. M. level of zinc in blood, organs, and urine during the development of experimental hepatitis and cirrhosis. ii. *Aktiv. Anal. Biol. Ob'Ektov* (1967) 92-8
- No Oral** Pringle, W. L., Dawley, W. K., and Miltimore, J. E. 1973. sufficiency of cu and zn in barley, forage, and corn silage rations as measured by response to supplements by beef cattle. *Canadian Journal of Animal Science* 53(3): 497-502.
- Nut def** Pritchard, G. C., Lewis, G., Wells, G. A. H., and Stopforth, A. 1985. zinc toxicity, copper

deficiency and anaemia in swill-fed pigs. *Veterinary Record* 117(21): 545-548.

- Nut def** Prohaska, J. R. changes in copper zinc-superoxide dismutase cytochrome c oxidase glutathione peroxidase and glutathionetransferase activities in copper-deficient mice and rats. *Journal of Nutrition*. 121 (3). 1991. 355-363.
- Abstract** Prohaska, J. R. 1997. response of peptidylglycine-alpha-amidating monooxygenase (pam) activity to variable copper (cu) status in sprague dawley rats. *FASEB Journal* 11(3): A363.
- Abstract** Prohaska, J. R., Howes, M. A., and Luecke, R. W. effect of dietary zinc on rat brain development. *Federation Proceedings*. 33 (3 Part 1). 1974 699
- Org Met** Prohaska, J. R. and Lukasewycz, O. A. 1989. copper deficiency during perinatal development effects on the immune response of mice. *Journal of Nutrition*. 119(6): 922-931.
- Org Met** Prohaska, J. R., Wittmers, L. E. Jr, and Haller, E. W. influence of genetic obesity food intake and adrenalectomy in mice on selected trace element-dependent protective enzymes. *J NUTR. Journal of Nutrition*. 118 (6). 1988. 739-746.
- Alt** Prohaska, Joseph R. effect of dietary copper deficiency on heterozygous female brindled mice. *Nutr. Res. (N. Y.)* (1988) 8(9): 1079-84.
- Nut def** Prohaska, Joseph R., Luecke, R. W., and Jasinski, Robert. effect of zinc deficiency from day 18 of gestation and/or during lactation on the development of some rat brain enzymes. *J. Nutr.* (1974) 104(11): 1525-31.
- Nut def** Prohaska Joseph R(A) and Bailey William R. 1993. persistent regional changes in brain copper, cuproenzymes and catecholamines following perinatal copper deficiency in mice. *Journal of Nutrition* 123(7): 1226-1234.
- No COC** Proulx, G. 1998. evaluation of strychnine and zinc phosphide baits to control northern pocket gophers (thomomys talpoides) in alfalfa fields in alberta, canada. *Crop Prot.* 17(2): 135-138.
- Phys** Pu Q-S, Li Y-Q, Cui, G., and Lu T-C. preliminary studies on preparation and pharmacology of zinc phenytoin. *CHIN J PHARM.* 22 (7). 1991. 308-310.
- Nut** Puchala, R., Sahlu, T., and Davis, J. J. 1999. effects of zinc-methionine on performance of angora goats. *Small Ruminant Research* 33(1): 1-8.
- Phys** Pullen, R. G., Franklin, P. A., and Hall, G. H. 1990. 65zinc uptake from blood into brain and other tissues in the rat. *Neurochemical Research* 15(10): 1003-8.
- Fate** Pullen, R. G., Franklin, P. A., and Hall, G. H. 1991. 65zn uptake from blood into brain in the rat. *Journal of Neurochemistry* 56(2): 485-9.
- Fate** Pullen, R. G. L., Franklin, P. A., and Hall, G. H. zinc-65 uptake from blood into brain and other tissues in the rat. *Neurochemical Research*. 15 (10). 1990. 1003-1008.
- Unrel** PULLEN, R. GL, FRANKLIN, P. A., and HALL, G. H. zinc-65 uptake from blood into brain in the rat. *J NEUROCHEM*; 56 (2). 1991. 485-489.
- Nut def** Punia, D. and Kapoor, A. C. gestational zinc deficiency in rats: plasma, tissue zinc and enzyme activities in dams and foetal zinc content. *Journal of Trace Elements in Experimental Medicine* 1989;2(2-3):2

- Phys** Puopolo, M. and Belluzzi, O. 1998. functional heterogeneity of periglomerular cells in the rat olfactory bulb. *European Journal of Neuroscience* 10(3): 1073-83.
- No Tox** Purvis, K., Haug, E., Thomassen, Y., Mevag, B., and Rui, H. short-term effects of mating on the accessory sex glands of the male rat. *J. Reprod. Fertil. (1986)* 77(2): 373-80 .
- FL** Qi Zhouyue (Shaanxi Inst. of Animal Science and Veterinary Medicine, Xianyang China. 1994. the effects of higher levels of cu and zn in diet on growth and meat quality of pigs. *Acta Zoonutrimenta Sinica*. V. 6(1) P. 22-26
- No COC** Qian, B.-C. and 5 others. 1989. effects of bee pollen on nutritional status and immunodepression in rats with malnutrition. *Chinese Journal of Pathophysiology* 5(7): 486-490.
- No COC** Qian, H., Kornegay, E. T., and Conner, D. E. Jr. 1996. adverse effects of wide calcium:phosphorus ratios on supplementalphytase efficacy for weanling pigs fed two dietary phosphorus levels. *Journal of Animal Science* 74(6): 1288-1297.
- No COC** Qian, H., Kornegay, E. T., and Veit, H. P. 1996. effects of supplemental phytase and phosphorus on histological, mechanical and chemical traits of tibia and performance of turkeys fedon soyabean-meal-based semi-purified diets high in phytate phosphorus. *British Journal of Nutrition* 76(2): 263-272.
- Unrel** Qiao, X. and Noebels, J. L. 1993. developmental analysis of hippocampal mossy fiber outgrowth in a mutant mouse with inherited spike-wave seizures. *Journal of Neuroscience* 13(11): 4622-35.
- Phys** Quaife, C., Hammer, R. E., Mottet, N. K., and Palmiter, R. D. 1986. glucocorticoid regulation of metallothionein during murine development. *Developmental Biology* 118(2): 549-55.
- Nut def** Quaife, C. J., Findley, S. D., Erickson, J. C., Froelick, G. J., Kelly, E. J., Zambrowicz, B. P., and Palmiter, R. D. 1994. induction of a new metallothionein isoform (mt-iv) occurs during differentiation of stratified squamous epithelia. *Vol. 33, No. 23, Pp. 7250-7259 Biochemistry (Wash.)*
- Alt** Quaife, C. J., Kelly, E. J., Masters, B. A., Brinster, R. L., and Palmiter, R. D. 1998. ectopic expression of metallothionein-iii causes pancreatic acinar cell necrosis in transgenic mice. *Toxicology and Applied Pharmacology* 148(1): 148-57.
- Alt** Quaife, Carol, Hammer, Robert E., Mottet, N. Karle, and Palmiter, Richard D. glucocorticoid regulation of metallothionein during murine development. *Dev. Biol. (1986)* 118(2): 549-55 .
- CP** Quarterman, J. 1974. effects of zinc deficiency or excess on the adrenals and the thymus in the rat. *Trace Elem. Metab. Anim. Proc. Int. Symp., 2nd* : Meeting Date 1973, 742-4. Editor(s): Hoekstra, W. G. Publisher: Univ. Park Press, Baltimore, Md..
- Nut def** Quarterman, J. and Florence, E. 1972. observations on glucose tolerance and plasma levels of free fatty acids and insulin in the zinc-deficient rat. *British Journal of Nutrition* 28(1): 75-9.
- Nut def** Quarterman, J. and Humphries, W. R. effect of zinc deficiency and zinc supplementation of adrenals plasma steroids and thymus in rats. *Life Sciences*. 24 (2). 1979. 177-184.
- Nut def** Quarterman, J. and Humphries, W. R. effect of zinc deficiency and zinc supplementation on adrenals, plasma steroids and thymus in rats. *Life Sci. (1979)* 24(2): 177-83
- Nut def** Quarterman, J. and Humphries, W. R. 1983. the production of zinc deficiency in the guinea

pig. *J. Comp. Pathol.* 93(2): 261-70 .

- CP** Quarterman, J., Humphries, W. R., and Florence, E. 1970. changes in appetite and alimentary muco substances in zinc deficiency. *Trace Elem. Metab. Anim. Proc. WAAP World Ass. Anim. Prod./IBP (Int. Biol. Progr.) Int. Symp.* Meeting Date 1969, 167-70. Editor(s): Mills, Colin F. Publisher: Livingstone, London, Engl.
- No Dose** Quaye, V. L., Shamalla-Hannah, L., and Land, P. W. 1999. experience-dependent alteration of zinc-containing circuits in somatosensory cortex of the mouse. *Brain Research. Developmental Brain Research* 114(2): 283-7.
- Unrel** Quigg, R. J., He, C., Lim, A., Berthiaume, D., Alexander, J. J., Kraus, D., and Holers, V. M. 1998. transgenic mice overexpressing the complement inhibitor crry as a soluble protein are protected from antibody-induced glomerular injury. *Journal of Experimental Medicine* 188(7): 1321-31.
- Mix** Quillian, E. R., Miller, W. J., Gentry, R. P., Heinmiller, S. R., and Neathery, M. W. maximum safe dietary magnesium and effects of high dietary magnesium on zinc metabolism in holstein calves. *Journal of Dairy Science.* 63 (3). 1980. 457-463.
- Nut** Quinn, Patricia B., Cremin, F. M., O'Sullivan, V. R., Hewedi, F. M., and Bond, R. J. the influence of dietary folate supplementation on the incidence of teratogenesis in zinc-deficient rats. *Br. J. Nutr.* (1990) 64(1): 233-43 .
- Nut** Quinton, D. A. beef cattle nutrition and performance on seeded clearcuts in southern interior british columbia canada. *Canadian Journal of Animal Science.* 67 (4). 1987. 919-928.
- FL** Quiroz Rocha Gerardo F(A), Bouda Jan(A), Medina Cruz Mario, Nunez Ochoa= Luis(A), and Yabuta Osorio Adolfo K. 1998. impact of colostrum management and quality serum immunoglobulin levels in calves. *Veterinaria - Mexico* 29(2): 161-166.
- Nut** Qureshi, M. S., Samad, H. A., Habib, G., Usmani, R. H., and Siddiqui, M. M. 1999. study on factors leading to seasonality of reproduction in dairybuffaloes. i. nutritional factors. *Asian-Australasian Journal of Animal Sciences* 12(7): 1019-1024.
- HHE** Qvist, I., Abdulla, M., Jagerstad, M., and Svensson, S. 1986. iron, zinc and folate status during pregnancy and 2 months after delivery. *Acta Obstetricia Et Gynecologica Scandinavica* 65(1): 15-22.
- No Dose** Qvist, I., Abdulla, M., Mathur, A., Robertson, B., and Svensson, S. 1983 . zinc, copper, magnesium, and calcium in blood and plasma after phlebotomy. *Scandinavian Journal Of Haematology* 31(2): 161-167.
- Nut def** Rabbani, P. and Prasad, A. S. plasma ammonia and liver ornithine trans carbamoylase activity in zinc deficient rats. *American Journal of Physiology.* 235 (2). 1978 E203-E206.
- Nut def** Rabbani, Parviz and Prasad, Ananda S. plasma ammonia and liver ornithine transcarbamoylase activity in zinc-deficient rats. *Am. J. Physiol.* (1978) 235(2): E203-E206.
- Unrel** Rabbani, S., Irfan, M., Muhammad, K., and Ahmed, Z. Q. 1990. studies on the transfer of maternal immunoglobulins in kids. *Archiva Veterinaria (Bucuresti)* 19: 53-59.
- Alt** Rabchevsky, A. G., Weinitz, J. M., Coulpier, M., Fages, C., Tinel, M., and Junier, M. P. 1998. a role for transforming growth factor alpha as an inducer of astrogliosis. *Journal of Neuroscience* 18(24): 10541-52.

- FL** Rabehl, N., Wolf, P., Wendler, C., Pannevis, M., and Kamphues, J. 1997. investigations on the chemical composition of commercial supplements pet birds with special regard to "moulting additives" for canaries. <original> untersuchungen zur chemischen zusammensetzung von ergaenzungsprodukten fuer ziervoegel mit besonderer beruecksichtigung von "mauserpraeparaten" fuer kanarien. *Uebersichten Zur Tierernaehrung*. V. 25(2) P. 235-236
- CP** Rabin, B. S. 1984. the effect of dietary zinc on life-span in autoimmune prone mice. *Federation Proceedings* 43: 859.
- No COC** Rada, V., Janesova, J., Marounek, M., and Vorisek, K. 1991. susceptibility of chicken intestinal lactobacilli to antimicrobial compounds. *Acta Veterinaria Brno* 60(4): 339-343.
- Nut def** Radcliffe, J. D. and Snedeker, S. M. 1987. growth inhibition of a methylcholanthrene-induced sarcoma by dietary zinc deficiency in the fischer rat. *Nutrition Reports International* 36(1): 41-48.
- Nut def** Radcliffe, John D. and Snedeker, Suzanne M. growth inhibition of a methylcholanthrene-induced sarcoma by dietary zinc deficiency in the fischer rat. *Nutr. Rep. Int.* (1987) 36(1): 41-8.
- Nut** Radecki, S. V., Juhl, M. R., and Miller, E. R. 1987. the effect of dietary fumaric acid on nutrient balance in starter pigs. *Research Report, Agricultural Experiment Station, University of Michigan* (487): 51-56.
- Abstract** RADER, J. I., HIGHT, S. C., ALVAREZ, G. H., and CAPAR, S. G. 1989. dietary tin at low levels decreases tissue copper and zinc in weanling rats. *73RD ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY*
- CP** Rader, J. I., Kaup, S. M., Wiensenfeld, P. W., Sundaresan, P. R., and Hight, S. C. interactions among dietary vitamin a zinc and copper in female sprague-dawley rats ii. effects of zinc and copper. *1992 MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY (FASEB), PART II, ANAHEIM, CALIFORNIA, USA, APRIL 5-9, 1992. FASEB (FED AM SOC EXP BIOL) J.* 6 (5). 1992. A1783.
- CP** Rader, J. J., Tao, S. H., Gaston, C. M., Wolnik, K. A., Fricke, F. L., and Fox, M. R. S. effects of phytic acid on bioavailability of trace elements in soy or casein-gelatin diets fed to weanling rats. *Trace Elements In Man And Animals : Tema 5 : Proceedings Of The Fifth International Symposium On Trace Elements In Man And Animals / Editors C.f. Mills, I. Bremner, & J.k. Chesters.* p. 458-460.
- No Oral** Radosevic-Stasic Biserka(A), Ravlic-Gulan Jagoda, Trobonjaca Zlatko, Cuk Mira, Muhvic Damir, Milin Cedomila, and Rukavina Daniel. 1997. age-dependent effect of peptidoglycan monomer linked with zinc on the generation of suppressor macrophages in mice. *Croatian Medical Journal* 38(3): 212-216.
- Phys** Radtke, F., Hug, M., Georgiev, O., Matsuo, K., and Schaffner, W. 1996. differential sensitivity of zinc finger transcription factors mtf-1, sp1 and krox-20 to cpg methylation of their binding sites. *Biological Chemistry Hoppe-Seyler* 377(1): 47-56.
- HHE** Rafferty, J. A., Fan, C. Y., Potter, P. M., Watson, A. J., Cawkwell, L., O'Connor, P. J., and Margison, G. P. 1992. tissue-specific expression and induction of human o6-alkylguanine-dna alkyltransferase in transgenic mice. *Molecular Carcinogenesis* 6(1): 26-31.
- Nut def** Rahman, Ahmed S., Kimura, M., and Itokawa, Y. testicular atrophy, zinc concentration, and angiotensin-converting enzyme activity in the testes of vitamin a-deficient rats. *Biol. Trace*

Elem. Res. (1999) 67(1): 29-36.

- Nut def** Rahman, Ahmed S., Kimura, Mieko, Yokoi, Katsuhiko, Tanvir-E-Naher, and Itokawa, Yoshinori. iron, zinc, and copper levels in different tissues of clinically vitamin a-deficient rats. *Biol. Trace Elem. Res.* (1995) 49(1): 75-84.
- CP** Rahman, M. A., Stork, J. E., and Dunn, M. J. the roles of eicosanoids in experimental glomerulonephritis. *FOURTH INTERNATIONAL CONGRESS ON NUTRITION AND METABOLISM IN RENAL DISEASE, WILLIAMSBURG, VIRGINIA, USA, 1985. KIDNEY INT SUPPL.* 0 (22). 1987. S-40-S-48.
- No COC** Rahman, M. H., Hossain, M. I., and Moslehuddin. mineral balance of rats fed on diets containing sweet lupin (*lupinus angustifolius* l.) or its fractions. *Anim. Feed Sci. Technol.* (1997) 65(1-4): 231-248.
- Nut def** Rahmat, A., Norman, J. N., and Smith, G. 1974. the effect of zinc deficiency on wound healing. *British Journal of Surgery* 61(4): 271-3.
- FL** Rahmatullah, M., Fong, Louise Y. Y., Lee, J. S. K., and Boyde, T. R. C. zinc-deficiency and activities of urea cycle-related enzymes in rats. *Experientia* (1980) 36(11): 1281-2.
- Nut** Rainbird, A. 1987. the influence of nutrition on skin and coat condition in dogs and cats. *Clinical Insight* 2(12): 695-696.
- Bio Acc** RAINBOW, P. S. copper, cadmium and zinc concentrations in oceanic amphipod and euphausiid crustaceans, as a source of heavy metals to pelagic seabirds. *MAR BIOL (BERL)*; 103 (4). 1989. 513-518.
- Nut def** Rains Tia and Shay Neil. 1996. zinc deficiency changes dominant macronutrient preferences of sprague-dawley outbred rats. *FASEB Journal* 10(3): A822.
- Nut def** Rains, Tia M. and Shay, Neil F. zinc status specifically changes preferences for carbohydrate and protein in rats selecting from separate carbohydrate-, protein-, and fat-containing diets. *J. Nutr.* (1995) 125(11): 2874-9.
- Nut def** Rains, Tia Michelle. 1998. macronutrient intake, growth hormone-releasing factor and somatostatin during zinc deficiency and repletion in rats. *Avail.: UMI. Order No. DA9904567 From: Diss. Abstr. Int., B* 1999, 59. 9. 4735. 133 pp.
- No Oral** Rainsford, K. D. and Whitehouse, M. W. antiulcer activity of a slow-release zinc complex, zinc monoglycerolate (glyzinc). *J. Pharm. Pharmacol.* (1992) 44(6): 476-82.
- IMM** Raja, C. A. R. and Balakrishnan, C. R. 1979. the effect of serum immunoglobulin level on health and survivability cross-bred calves. *Kerala Journal of Veterinary Science* 10(1): 65-70.
- Mix** Rajan, K. S., Diamond, B. I., Borison, R. L., and Davis, J. M. therapeutic efficacy of metal atp chelates of l dopa in animal models for parkinson's disease. *Biochemical Archives.* 2 (2). 1986. 107-120.
- No COC** Rajora, V. S. and Pachauri, S. P. 1994. blood profiles in preparturient and postparturient cows and in milk-fever cases. *Indian Journal of Animal Sciences* 64(1): 31-34.
- Surv** Rajora, V. S(A) and Pachauri, S. P. 1998. monitoring of mineral profiles in a crossbred herd. *Indian Jounal of Animal Sciences* 68(3): 251-253.

- No COC** Ralston, A. T., Taylor, N. O., and Davidson, T. P. effect of di ethyl stilbestrol on growth and carcass quality of beef cattle. *OREG AGR EXP STA TECH BULL.* 110. 1969 3-10
- Nut** Ralston, S. L. 1997. feeding the rapidly growing foal. *Journal of Equine Veterinary Science* 17(12): 634-636.
- Drug** Ralston, S. L. and <Editors> Caddel, L. B. 1993. therapeutic nutrition for specific syndromes. 693-698.
- Org Met** Ram Rao, Ghouse, M., and Rao, D. S. T. 1993. therapy of experimental zinc phosphide poisoning in canines. *Indian Journal of Veterinary Medicine* 13(2): 85.
- Nut def** Ramachandran, C. K. and Shah, Shantilal N. effect of feeding zinc-deficient diet to dams during lactation on brain development of the offspring in rats : lipid composition of whole brain, myelin and synaptosomes. *Biochem. Arch. (1985)* 1(2): 107-14
- FL** Ramadori, G., Keidl, E., Hutteroth, T., Dormeyer, H. H., Manns, M., and Zumbuschenfelde, K. H. M. 1985. oral zinc therapy in wilsons-disease - an alternative to d-penicillamine. *Zeitschrift Fur Gastroenterologie* 23(1): 25-29.
- No COC** Ramadurai, Sujatha M A, Nielsen, Heber C, Chen, Youwei, Hatzis, Dimitrios, and Sosenko, Ilene R S. 1998. differential effects in vivo of thyroid hormone on the expression of surfactant phospholipid, surfactant protein mrna and antioxidant enzyme mrna in fetal rat lung. *Experimental Lung Research* 24(5): 641-657.
- Bact** Ramaeker, M., Jones, C., and Spain, J. 1995. relationship of zinc status on keratin production and response to intramammary escherichia coli infection. *Journal of Dairy Science* 78(SUPPL. 1): 313.
- Nut** Ramakrishnan, A. and Mithuji, G. F. effect of added zinc and iodine on the growth of chicks. *Indian J. Anim. Sci. (1971)* 41(10): 999-1002 .
- No COC** Ramesh, P. 1987. two baiting methods for nesokia indica gray, their relative efficacy and economics. *Indian J.Plant Prot.* 15(2): 174-175.
- Org Met** Ramey, C. A. and Sterner, R. T. mortality of gallinaceous birds associated with 2% zinc phosphide baits for control of voles in alfalfa. *Int. Biodeterior. Biodegrad. (1995)* 36(1/2): 51-64.
- No COC** Ramey, C. A. Bourassa J. B. and Brooks J. E. 2000. potential risks to ring-necked pheasants in california agricultural areas using zinc phosphide. *Int.Biodeterior.Biodegrad.* 45(3/4): 223-230.
- Unrel** Ramirez, C. E. and Ferrer, C. G. 1991. influence of different variables (herd, season and production category)on plasma cu and zn concentrations in dairy cattle. *Revista De Medicina Veterinaria (Buenos Aires)* 72(1): 16-18.
- OAC** Ramirez, R., Alfonso, H. A., Hernandez, C. A., Alfonso, A., Escobar, A., Colome, H., Figueredo, J. M., Merino, N., Fernandez, O., and Labrada, I. thyroid disorders and hematochemical behavior in feed lot of zebu steers with two diet systems with leucaena-leucocephala. *Revista De Salud Animal.* 11 (1). 1989. 66-73.
- OAC** Ramirez, R., Alfonso, H. A., Hernandez, C. A., Alfonso, A., Escobar, A., Colome, H., Figueredo, J. M., Merino, N., Fernandez, O., and Labrada, I. 1989. thyroid changes and blood chemistry of fattening zebu on two systems of feeding with leucaena leucocephala. *Revista De Salud Animal*

11(1): 66-73.

- Nut def** Ramisse, J., Emeriau, J.-P., Henry, Y., and Brebion, M. 1982. nervous syndrome with mortality associated with magnesium deficiency insheep. *Point Veterinaire* 14(67): 65-67.
- Not Avail** Ramkrishnan, A. effect of added zinc and iodine on the growth and productive performance of poultry. *B.A. (BANSILAL AMRITLAL) AGRIC COLL MAG.* 22. 1969-1970 26
- Bio Acc** Ramos, J. J., Marea, M. C., Fernandez, A., Sanz, M. C., and Blanco, A. 1995. micromineral levels in sheep in the region of borja. *Avances En Alimentacion y Mejora Animal* 35(1): 7-10.
- FL** Ramos, J. J., Verde, M. T., Marca, M. C., Fernandez, A., and Saez, T. Zaragoza Univ. Espana Facultad de Veterinaria. 1993. [observations on zinc levels in sheep of ebro middle valley]. <original> observaciones sobre los niveles sericos de cinc en ganado ovino del valle medio del ebro. *Avances En Alimentacion y Mejora Animal.* V. 33(3) P. 13-17
- Abstract** Ramos, R. A., Meilandt, W. J., Wang, E. C., and Firestone, G. L. 1999. dysfunctional glucocorticoid receptor with a single point mutation ablates the ccaat/enhancer binding protein-dependent growth suppression response in a steroid-resistant rat hepatoma cell variant. *Vol. 13, No. 1, 169* Faseb Journal
- FL** Ramos Rubens Bastos, Fuentes Maria De Fatima Freire, Espindola Gastao= Barreto, Lima Francisco De Assis Melo, and Freitas Ednardo Rodrigues. 1999. effect of different methods of molt induction on performance of commercial laying hens. *Revista Brasileira De Zootecnia* 28(6): 1340-1346.
- CP** Ramoun, A. A., Bakr, A. A., <Editors> Shehab, M. M., El-Tahlawy, M. R., and Mahmoud, M. R. 1998. response of buffaloes with smooth inactive ovaries to different dietaryzinc levels (of) supplementation. <Document Title>*Eighth Scientific Congress, Faculty of VeterinaryMedicine, Assiut University, 15-17 November, 1998.* 768-780.
- No Oral** Rana, S. V. S. 1980. visual evidences on reversible dysenzymia induced by zinc and a new chelating agent in ccl4 poisoned liver of squirrels. *Mikroskopie.* 36: 233-241.
- Phys** Rana, S. V. S. and Chauhan, A. 1998. alleviation of lipid peroxidation in liver and kidney of molybdenotic rats by methionine and zinc. *Environmental & Nutritional Interactions.* 2(1/2): 15-20.
- Abstract** RANA, S. VS. 1980. enzymes in the liver of rats exposed to few trace elements. *2ND INTERNATIONAL CONGRESS ON TOXICOLOGY*
- Unrel** RANA, S. VS and TAYAL, M. K. significance of beta glucuronidase and glucose-6-phosphatase dehydrogenase in liver injury and its protection in rats. *PROC INDIAN NATL SCI ACAD PART B BIOL SCI; 52 (4).* 1986 (RECD. 1987). 477-480.
- Unrel** Rana, Suresh V. S. and Chauhan, Archana. influence of methionine and zinc on liver collagen in molybdenotic rats . relationship with lipid peroxidation. *Biol. Trace Elem. Res. (2000)* 73(1): 85-91
- Carcin** Ranade, S. S., Murugaiyan, P., Manerikar, B. S., and Joshi, S. D. 1986. alteration of macromolecular events and elemental levels in the skin of uvc exposed hairless mice. *Physiol. Chem. Phys. Med. NMR* 18(3): 197-205 .
- CP** Randall, A. C. and Shay, N. F. 1996. zinc status effects on growth, appetite, and neuropeptide y levels in rats of different weights and ages. *FASEB Journal* 10(3): A193.

- Nut** Randolph, J. C(A), Cameron Guy N, and McClure Polley A. 1995. nutritional requirements for reproduction in the hispid cotton rat, sigmodon hispidus. *Journal of Mammalogy* 76(4): 1113-1126.
- Abstract** Randy, H. A., Sniffen, C. J., Nocek, J. E., Wildman, E. E., and Braund, M. V. effect of zinc methionine supplementation on milk yield lameness and hoof growth in lactating dairy cows. *ANNUAL MEETING OF THE AMERICAN DAIRY SCIENCE ASSOCIATION (NORTHEAST BRANCH), AMHERST, MASS., USA, JULY 14-17, 1985. J DAIRY SCI.* 68 (Suppl. 1). 1985. 277.
- Nut** Rangachar, T. R. S. and Jayaprakash. effect of copper and zinc supplementation on the hemogram of poultry. *Indian J. Poult. Sci.* (1979) 14(4): 189-93.
- IMM** Rangachar, T. R. S., Jayaprakash, and Thimmaiah, K. 1978. immunological responses to copper and zinc supplementation in poultry. *Indian Journal of Poultry Science.* 13(1): 39-43.
- CP** Ranhotra, G. S. and Gelroth, J. A. 1983. zinc bioavailability from cereal-based foods. *Acs Symposium Series* 210: 185-195.
- Nut** Ranhotra, G. S., Lee, C., and Gelroth, J. A. bio availability of zinc in cookies fortified with soy and zinc. *Cereal Chemistry.* 56 (6). 1979. 552-554.
- Nut def** Ranhotra, G. S., Lee, C., and Gelroth, J. A. bioavailability of zinc in soy-fortified wheat bread. *Nutr. Rep. Int.* (1978) 18(4): 487-94 .
- Nut def** Ranhotra, G. S., Loewe, R. J., and Puyat, L. V. interaction and bio availability of iron zinc and magnesium. *Cereal Chemistry.* 55 (5). 1978. 675-682.
- No COC** Ranieri-Raggi, M. and Raggi, A. 1984. effect of ph and kcl on aggregation state and sulphhydryl groups reactivity of rat skeletal muscle amp deaminase. *Italian Journal of Biochemistry* 33(3): 155-76.
- Diss** Rankins, D. L. 1990. evaluation of kochia scoparia (L.) schrad. toxicosis in sheep and cattle. *Dissertation Abstracts International. B, Sciences and Engineering* 50(8): 3228B.
- No Oral** Rankins, D. L. Jr and Smith, G. S. 1991. nutritional and toxicological evaluations of kochia hay (kochia scoparia) fed to lambs. *Journal of Animal Science* 69(7): 2925-31.
- No COC** Rao, A. G. and Neet, K. E. 1984. subunit interactions of 7 s nerve growth factor. gamma-esterase activity, rates, and conformational changes during reassociation. *Journal of Biological Chemistry* 259(1): 73-9.
- No COC** Rao, A. M. K. M. 1992. integrated rodent management. *Rodents in Indian Agriculture.* 1: 651-667.
- Bio Acc** Rao, D. S. S. and Deosthale, Y. G. 1983. mineral-composition, ionizable iron and soluble zinc in malted grains of pearl-millet and ragi. *Food Chemistry* 11(3): 217-223.
- Carcin** Rao, E. A., Saryan, L. A., Antholine, W. E., and Petering, D. H. 1980. cytotoxic and antitumor properties of bleomycin and several of its metal complexes. *Journal of Medicinal Chemistry* 23(12): 1310-8.
- Nut def** Rao, P. K. and Prasad, D. A. economic rations based on rice byproducts for growing large white yorkshire pigs. *INDIAN J ANIM SCI. Indian Journal of Animal Sciences.* 50 (1). 1980. 63-67.
- Food** Rao, P. Udayasekhara. evaluation of protein quality of brown and white ragi (eleusine coracana)

before and after malting. *Food Chem.* (1994) 51(4): 433-6.

- FL** Rao, S. V. Rama(A), Praharaj, N. K., Raju, M. V. L. N., Chawak, M. M., and Reddy, M. R. 1997. protein, calcium, and phosphorus requirements of force moulted white leghorn layers. *Archiv Fuer Gefluegelkunde* 61(6): 262-266.
- Nut def** Rao, V. Hanumantha and Bose, S. M. effect of zinc deficiency on the formation of collagen and nucleic acids in the albino rat skins and granulomas. *Leather Sci. (Madras)* (1971) 18(8): 211-17
- FL** Rao, Xinhua and Zhou, Yaping. experiments on excessive zinc fed to rats. *Guangdong Weiliang Yuansu Kexue* (1997) 4(12): 31-33 .
- Unrel** Rapisarda, E. and Longo, A. 1981. [effects of zinc and vitamin b 6 in experimental caries in rats]. <original> effetti dello zinco e della vitamina b6 nella carie sperimentale del ratto. *Minerva Stomatologica* 30(4): 317-20.
- Unrel** Rapisarda, E. and Longo, A. 1981. [vitamin e and experimental caries in rats fed a cariogenic diet and zinc]. <original> vitamina "e" e carie sperimentale in ratti trattati con dieta cariogena e zinco. *Minerva Stomatologica* 30(4): 313-6.
- Unrel** Rapisarda, E. and Longo, A. 1982. [zinc in experimental caries in the rat]. <original> lo zinco nella carie sperimentale del ratto. *Minerva Stomatologica* 31(2): 189-92 .
- Abstract** Rasmussen, A. I. interactions between dietary vitamin b-6 level protein quality and quantity in young rats. 65TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ATLANTA, GA., USA, APRIL 12-17, 1981. *FED PROC.* 40 (3 Part 2). 1981. 863.
- CP** Rasmussen, A. I. 1982. zinc depletion with dietary histidine in growing-rats. *Federation Proceedings* 41: 781.
- Gene** Rasmussen, C. D. and Means, A. R. calmodulin is required for cell-cycle progression during g-1 and mitosis. *J. EMBO (European Molecular Biology Organization) Journal.* 8 (1). 1989. 73-82.
- Prim** Rasmussen, K. M., Thenen, S. W., and Hayes, K. C. 1980. effect of folic acid supplementation on pregnancy in the squirrel monkey (saimiri sciureus). *Journal of Medical Primatology* 9(3): 169-84.
- No COC** Rasul, A. R. and Howell, J. McC. 1974. the toxicity of some dithiocarbamate compounds in young and adult domestic fowl. *Toxicology and Applied Pharmacology* 30(No.1): 63-78.
- Carcin** RATH, F. W. and FELICETTI, D. histochemical demonstration of a zinc activated tartrate registrant acid phosphatase in experimentally induced glial microtumors of the rat brain. *ACTA HISTOCHEM*; 53 (2). 1975 291-301
- FL** Rath, F. W. and Felicetti, D. 1975. [histochemical demonstration of a zinc activated tartrate resistant acid phosphatase in experimentally induced glial microtumors of the rat brain (author's transl)]. <original> histochemische darstellung einer durch zink aktivierten tartrat-resistenten sauren phosphatase in experimentell induzierten gliosen mikrotumoren des rattengrosshirns. *Acta Histochemica* 53(2): 291-301.
- No Oral** Rath, F. W., Koertge, R., Haase, P., and Bismarck, M. 1990. effect of oral zinc treatment on metastases formation after intravenous administration of cells of benzyrene-induced rat

sarcoma. *Acta Histochem. Suppl.* 39: 201-3.

- FL** Rath, F. W., Kortge, R., Haase, P., and Bismarck, M. 1990. [effect of the oral administration of zinc on metastasis after intravenous application of benzpyrene-induced rat sarcoma cells]. <original> zur wirkung oral applizierten zinks auf die metastasenbildung nach intravenoser applikation von zellen eines benzpyreninduzierten rattensarkoms. *Acta Histochemica* 39: 201-3.
- Mix** Ratich, I. B. and Kiriliv, Ya. I. 1997. effect of a mineral-vitamin mixture on biological value of goose eggs and indicators of protein metabolism in the embryo. *Visnik Agrarnoi Nauki* (3): 35-37,85,87.
- Prim** Ratka, M., Lackmann, M., Ueckermann, C., Karlins, U., and Koch, G. 1989. poliovirus-associated protein kinase: destabilization of the virus capsid and stimulation of the phosphorylation reaction by zn^{2+} . *Journal of Virology* 63(9): 3954-60.
- Prim** Ratka, Michael, Lackmann, Martin, Ueckermann, Christian, Karlins, Ulrich, and Koch, Gebhard. poliovirus-associated protein kinase: destabilization of the virus capsid and stimulation of the phosphorylation reaction by zinc. *J. Virol.* (1989) 63(9): 3954-60.
- Unrel** Ratkovic, S., Rusov, C., and Stojanovic, D. rous sarcoma studied by proton nuclear magnetic resonance. *Acta Biol. Med. Exp.* (1978) 3(1): 31-5.
- No Dose** Rattner, B. A. and Jehl, J. R. Jr. 1997. dramatic fluctuations in liver mass and metal content of eared grebes (*podiceps nigricollis*) during autumnal migration. *Bull Environ Contam Toxicol.* 59(3): 337-43.
- CP** Ratziu V(A), Kim, S. J., Kim, Y. S., Dang, Q., Wong, L., and Friedman, S. L. 1997. a key role for *zfp9* in hepatic fibrosis via its transcriptional activation of *tgf-beta-1* and types i and ii *tgf-beta* receptor genes in rat stellate cells. *Hepatology* 26(4 PART 2): 185A.
- Plant** Raveendran, E. Environ Protection Committee Bahrain, Grieve, Ian C., and Madany, Ismail M. effects of organic amendments and irrigation waters on the physical and. *Environ Monitor Assess.* V30, N2, P177(20)
- Drug** Raveh Lily(A), Chapman Shira, Cohen Giora, Alkalay David, Gilat Eran, Rabinovitz Ishai, and Weissman Ben Avi. 1999. the involvement of the *nmda* receptor complex in the protective effect of anticholinergic drugs against soman poisoning. *Neurotoxicology (Little Rock)* 20(4): 551-560.
- Drug** Ravino, O. J., Andriuli, F. J., and Washko, F. V. 1980. compatibility studies with arprinocid, roxarsone, and antibiotics in chickens. *Poultry Science* 59(7): 1654.
- Nut def** Ray, S. K., Roychoudhury, R., Bandopadhyay, S. K., and Basu, S. 1997. studies of 'zinc deficiency syndrome' in black bengal goats (*capra hircus*) fed with fodder (*andropogon gayanus*) grown on soil treated with an excess of calcium and phosphorus fertilizer. *Veterinary Research Communications* 21(8): 541-546.
- Nut def** Ray, S. K., Roychoudhury, R., Bandopadhyay, S. K., and Basu S(A). 1997. studies on 'zinc deficiency syndrome' in black bengal goats (*capra hircus*) fed with fodder (*andropogon gayanus*) grown on soil treated with an excess of calcium and phosphorus fertilizer. *Veterinary Research Communications* 21(8): 541-546.
- Meth** Rea, D. E., Tyler, J. W., Hancock, D. D. , Besser, T. E., Wilson, L., Krytenberg, D. S. , and Sanders, S. G. 1996. prediction of calf mortality by use of tests for passive transfer of colostral

immunoglobulin. *Journal of the American Veterinary Medical Association* 208(12): 2047-2049.

- Chem Meth** Reading, H. W. calcium release and aggregation in rabbit platelets action of psychotropic drugs. *Cellular and Molecular Biology*. 25 (6). 1979 (Recd. 1980). 421-428.
- Unrel** Reaume Andrew G(A), Elliott Jeffrey L, Hoffman Eric K(A), Kowall Neil W, Ferrante Robert J, Siwek Donald F, Wilcox Heide M(A), Flood Dorothy G= (A), Beal, M. Flint, Brown Robert H Jr, Scott Richard W(A), and Snider William D. 1996. motor neurons in cu/zn superoxide dismutase-deficient mice develop normally but exhibit enhanced cell death after axonal injury. *Nature Genetics* 13(1): 43-47.
- Nut def** Reaves, Scott K., Fanzo, Jessica C., Wu, John Y. J., Wang, Yi Ran, Wu, Yan W., Zhu, Lei, and Lei, Kai Y. plasma apolipoprotein b-48, hepatic apolipoprotein b mrna editing and apolipoprotein b mrna editing catalytic subunit-1 mrna levels are altered in zinc-deficient rats. *J. Nutr.* (1999) 129(10): 1855-1861.
- HHE** Rebello, T., Atherton, D. J., and Holden, C. 1986. the effect of oral zinc administration on sebum free fatty-acids in acne-vulgaris. *Acta Dermato-Venereologica* 66(4): 305-310.
- Nut def** Record, I. R. 1987. zinc-deficiency and the developing embryo. *Neurotoxicology* 8(3): 369-378.
- Nut def** Record, I. R. and Dreosti, I. E. changes in foetal liver and brain thymidine kinase activity due to maternal zinc deficiency.
- Nut def** Record, I. R. and Dreosti, I. E. 1979. effects of zinc deficiency on liver and brain thymidine kinase in the fetal rat. *Nutrition Reports International* 20(6): 749-755.
- Abstract** RECORD, I. R. and DREOSTI, I. E. the teratology of zinc deficiency in rats and mice. *TERATOLOGY* 35(2):65A,1987
- CP** Record, I. R. and Dreosti, I. E. 1981. uptake of zinc by rat hippocampal slices during postnatal-development. *Proceedings Of The Australian Biochemical Society* 14: 60.
- Nut def** Record, I. R. and Dreosti, I. E. zinc and riboflavin interactions with salicylate in pregnant rats. *Nutr. Rep. Int.* (1988) 38(5): 1041-8 .
- CP** Record, I. R., Dreosti, I. E., and Buckley, R. A. 1988. interactions between zinc, iron and folic acid in the pregnant rat. *Proceedings of the Nutrition Society of Australia* 13: 85.
- Nut def** Record, I. R., Dreosti, I. E., Manuel, S. J., and Buckley, R. A. compositional development of the zinc-deficient fetal rat. *Proceedings - Nutrition Society Of Australia*. 1980. v. 5 p. 157.
- CP** Record, I. R., Dreosti, I. E., Manuel, S. J., Buckley, R. A., and Tulsi, R. S. 1985. teratological influence of the feeding cycle in zinc-deficient rats. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th* : Meeting Date 1984, 210-13. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK..
- Abstract** RECORD, I. R., DREOSTI, I. E., and TULSI, R. S. fetal outcome following transient zinc deficiency in the pregnant rat. *TERATOLOGY* 33(3):6B,1986
- Nut def** Record, I. R., Dreosti, I. E., and Tulsi, R. S. 1987. growth and development of the zinc-deficient mouse embryo. *Nutrition Research* 7(11): 1209-1214.

- Nut def** Record, I. R., Dreosti, I. E., and Tulsi, R. S. 1985. invitro development of zinc-deficient and replete rat embryos. *Australian Journal Of Experimental Biology And Medical Science* 1985, V63, Feb, P65-71
- In Vit** Record, I. R., Dreosti, I. E., Tulsi, R. S., and Manuel, S. J. 1984. growth of zinc-deficient rat embryos invitro . *Teratology* 29: A53.
- Nut def** Record, I. R., Dreosti, I. E., Tulsi, R. S., and Manuel, S. J. maternal metabolism and teratogenesis in zinc-deficient rats. *Teratology* (1986) 33(3): 311-17
- Abstract** RECORD, I. R., DREOSTI, I. E., TULSI, R. S., MANUEL, S. J., and FRASER, F. J. the zinc deficient rat embryo: morphological and biochemical observations. *TERATOLOGY* 30(1):49A,1984
- Nut def** Record, I. R., Tulsi, R. S., and Dreosti, I. E. 1986. dietary zinc-deficiency induces cell necrosis in rat embryos. *Teratology* 33: B4.
- In Vit** Record, I. R., Tulsi, R. S., Dreosti, I. E., and Fraser, F. J. 1985. cellular necrosis in zinc-deficient rat embryos. *Teratology* 32(3): 397-405.
- Nut def** Record, I. R., Tulsi, R. S., Dreosti, I. E., and Manuel, S. J. 1985. induction of teratogenic abnormalities in rats by maternal dietary zinc-deficiency. *Journal Of Anatomy* 1985, V142, Oct, P223
- In Vit** Record, I. R. LIFSA, Dreosti, I. E., Manuel, S. J., and Buckley, R. A. interactions of cadmium and zinc in cultured rat embryos (maternal malnourishment, maternal nutrition). *Life Sciences*. Dec 13, 1982. v. 31 (24) p. 2735-2743. ill.
- Nut def** Record, Ian R., Dreosti, Ivor E., and Tulsi, Ram S. growth and development of the zinc-deficient mouse embryo. *Nutr. Res. (N. Y.)* (1987) 7(11): 1209-14
- Alt** Reddi Alluru S and Bollineni Jaya S. 1997. renal cortical expression of mrnas for antioxidant enzymes in normal and diabetic rats. *Biochemical and Biophysical Research Communications* 235(3): 598-601.
- No COC** Reddy, Bandaru S., Pleasants, Julian R., and Wostmann, Bernard S. effect of intestinal microflora on iron and zinc metabolism, and on activities of metalloenzymes in rats. *J. Nutr.* (1972) 102(1): 101-7 .
- CP** REDDY, C. S. 1986. antidotal use of zinc and sodium sulfate against chronic cadmium toxicity in calves and mice. *FOURTH INTERNATIONAL CONGRESS OF TOXICOLOGY*
- Gene** Reddy, J. C., Hosono, S., and Licht, J. D. 1995. the transcriptional effect of wt1 is modulated by choice of expression vector. *Journal of Biological Chemistry* 270(50): 29976-82.
- No COC** Redman, K. L. and Rechsteiner, M. 1989. identification of the long ubiquitin extension as ribosomal protein s27a. *Nature* 338(6214): 438-40.
- Abstract** Redman, R. S., Calhoun, N. R., and Smith, J. C. Jr. pre weaning zinc deficiency impairs development of rat submandibular granular ducts. *60TH GENERAL SESSION OF THE INTERNATIONAL ASSOCIATION FOR DENTAL RESEARCH AND ANNUAL SESSION OF THE AMERICAN ASSOCIATION FOR DENTAL RESEARCH, NEW ORLEANS, LA., USA, MARCH 18-21, 1982. J DENT RES.* 61 (Spec. Issue). 1982. 324.
- Unrel** Redman, R. S., Hsiao, L. L., McNutt, R. L., Larson, R. H., and Smith, J. C. 1986. moderate zinc-

deficiency during postnatal-development affects caries in rats. *Journal Of Dental Research* 65: 200.

- Rev** Reece, R. L., Dickson, D. B., and Burrowes, P. J. 1986. zinc toxicity (new wire disease) in aviary birds. *Australian Veterinary Journal*. 63(6): 199.
- CP** Reed, J. R. dietary factors affecting fertility and hatchability in chickens and turkeys. *AM FEED MANUF ASSOC PROC MEET NUTR COUNC*. 32 (11). 1972 (Recd 1973) 19-25
- Abstract** Reese, R. N., Nulty, E., and Wagner, G. J. differences in the behavior of tobacco and cabbage leaf cadmium complexes vs. rat cadmium zinc thionein under native and denaturing conditions. *ANNUAL MEETING OF THE AMERICAN SOCIETY OF PLANT PHYSIOLOGISTS, PROVIDENCE, R.I., USA, JUNE 23-28, 1985. PLANT PHYSIOL (BETHESDA)*. 77 (Suppl. 4). 1985. 119.
- CP** Reeves, P. G. effect of cis diamminedichloroplatinum ddp on metallothionein mt and trace element metabolism in rats fed different amounts of dietary zinc and copper. *74TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, PART I, WASHINGTON, D.C., USA, APRIL 1-5, 1990. FASEB (FED AM SOC EXP BIOL) J*. 4 (3). 1990. A516.
- CP** Reeves, P. G. 1996. the effects of excess dietary zinc (zn) on copper (cu) metabolism in rats are age- and diet-dependent. *FASEB Journal* 10(3): A531.
- Nut def** Reeves, P. G., Frissell, S. G., and O'Dell, B. L. 1977. response of serum corticosterone to acth and stress in the zinc-deficient rat. *Proceedings of the Society for Experimental Biology and Medicine*; 156
- CP** Reeves, P. G. and Nelson, K. L. 1991. cis-diamminedichloroplatinum treatment and trace element metabolism in rats fed different amounts of dietary zinc and copper. *Trace Elem. Man Anim. 7: Monogr. Proc., Round Tables Discuss. Int. Symp., 7th : Meeting Date 1990, 24-8-24/9. Editor(s): Momcilovic, Berislav. Publisher: Inst. Med. Res. Occup. Health Univ. Zagreb, Zagreb, Yugoslavia..*
- Drug** Reeves, P. G. and Nelson, K. L. effect of zinc pretreatment on cisplatin toxicity and trace element metabolism in rats. *Journal of Trace Elements in Experimental Medicine*. 4 (2). 1991. 89-102.
- CP** Reeves, P. G., Nelson, K. L., and Bobilya, D. J. short-term effects of depot zinc and high dietary zinc on zinc copper and iron metabolism in rats. *75TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ATLANTA, GEORGIA, USA, APRIL 21-25, 1991. FASEB (FED AM SOC EXP BIOL) J*. 5 (5). 1991. A1290.
- Nut def** Reeves, P. G., Noordewier, B., and Saari, J. T. effect of copper deficiency and cis-diamminedichloroplatinum(ii) treatment on the activities of renal microvillar enzymes in rats. *J. Trace Elem. Electrolytes Health Dis. (1990)* 4(1): 11-19.
- Nut def** Reeves, P. G. and O'Dell, B. L. 1988. effect of zinc deficiency on blood pressure in rats fed normal and high levels of dietary calcium. *Nutrition Research*. 8(10): 1143-1150.
- CP** Reeves, P. G. and O'Dell, B. L. the effects of a mild zinc deficiency on glucose metabolism in fasted-refed rats. *Trace Elements In Man And Animals : Tema 5 : Proceedings Of The Fifth International Symposium On Trace Elements In Man And Animals / Editors C.f. Mills, I. Bremner, & J.k. Chesters*. p. 55-58.
- Nut def** Reeves, P. G. and O'Dell, B. L. 1986. effects of dietary zinc deprivation on the activity of

angiotensin-converting enzyme in serum of rats and guinea pigs. *The Journal Of Nutrition*. 116(1): 128-134.

- CP** Reeves, P. G. and O'Dell, B. L. 1985. the effects of zinc deficiency on glucose metabolism in isolated adipocytes of rats. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp.*, 5th : Meeting Date 1984, 58-61. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK.
- CP** Reeves, P. G. and O'Dell, B. L. 1982. regulation of protein intake in zinc deficient rats. *Trace Elem. Metab. Man Anim. Proc. Int. Symp.*, 4th : Meeting Date 1981, 338-41. Editor(s): Gawthorne, J. M.; Howell, J. McC.; White, C. L. Publisher: Springer, Berlin, Fed. Rep. Ger.
- CP** Reeves, P. G. and O'Dell, B. L. regulation of protein intake in zinc deficient rats (food intake, nutrient preference). *Proceedings ... Symposium On Trace Element Metabolism In Man And Animals*. 1981 (pub. 1982). 1981 (pub. 1982). (4th) p. 338-341.
- Nut def** Reeves, P. G. and O'Dell, B. L. 1981. short-term zinc deficiency in the rat and self-selection of dietary protein level. *The Journal Of Nutrition*. 111 (2): 375-383.
- Nut def** Reeves, P. G. and O'Dell, B. L. 1988. zinc deficiency in rats and angiotensin-converting enzyme activity: comparative effects on lung and testis. *The Journal Of Nutrition*. 118(5): 622-626.
- CP** Reeves, P. G. and O'Dell, Boyd L. 1985. the effects of a mild zinc deficiency on glucose metabolism in fasted-refed rats. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp.*, 5th : Meeting Date 1984, 55-8. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK.
- Abstract** Reeves, P. G. and Odell, B. L. 1976. influence of dietary zinc on tyrosine and tryptophan contents of rat-brain. *Journal Of Nutrition* 106: R17.
- CP** Reeves, P. G., Rossow, K. L., and Skinner, B. K. 1993. effects of high dietary zinc and cadmium on copper status in rats: relationship to intestinal metallothionein (imt). *FASEB Journal* 7(3-4): A305.
- Nut def** Reeves, P. G. BJNUA and O'Dell, B. L. 1983. the effect of zinc deficiency on glucose metabolism in meal-fed rats. *The British Journal Of Nutrition*. 49 (3): 441-452.
- No Control** Reeves, Philip G. copper metabolism in metallothionein-null mice fed a high-zinc diet. *J. Nutr. Biochem.* (1998) 9(10): 598-601.
- Nut** Reeves, Philip G. copper status of adult male rats is not affected by feeding an ain-93g-based diet containing high concentrations of zinc. *J. Nutr. Biochem.* (1996) 7(3): 166-72.
- Nut def** Reeves, Philip G. effects of zinc deficiency and testosterone treatment on the activities of dipeptidyl carboxypeptidase and other enzymes in the testis of rats. *Nutr. Res. (N. Y.)* (1990) 19(8): 859-69.
- Nut def** Reeves, Philip G. zinc deficiency and dipeptidyl carboxypeptidase activity: comparative effects on epididymis and testis of rats. *Biol. Trace Elem. Res.* (1990) 24(1): 1-11.
- Nut def** Reeves, Philip G., Frissell, Sam G., and O'Dell, Boyd L. response of serum corticosterone to acth and stress in the zinc-deficient rat. *Proc. Soc. Exp. Biol. Med.* (1977) 156(3): 500-4.
- Food** Reeves, Philip G., Johnson, Phyllis E., and Rossow, Kerry L. absorption and organ content of cadmium from the kernels of confectionery sunflowers (*helianthus annuus*) fed to male rats. *J.*

Agric. Food Chem. (1994) 42(12): 2836-43.

- Nut def** Reeves, Philip G. and O'Dell, Boyd L. the effect of dietary tyrosine levels on food intake in zinc-deficient rats. *J. Nutr. (1984) 114(4): 761-7.*
- Nut def** Reeves, Philip G. and O'Dell, Boyd L. 1988. effect of zinc deficiency on blood pressure in rats fed normal and high levels of dietary calcium. *Nutr. Res. (N. Y.) 8(10): 1143-50 .*
- Nut def** Reeves, Philip G. and O'Dell, Boyd L. 1986. effects of dietary zinc deprivation on the activity of angiotensin-converting enzyme in serum of rats and guinea pigs. *J. Nutr. 116(1): 128-34.*
- Nut def** Reeves, Philip G. and O'Dell, Boyd L. short-term zinc deficiency in the rat and self-selection of dietary protein level. *J. Nutr. (1981) 111(2): 375-83.*
- Nut def** Reeves, Philip G. and O'Dell, Boyd L. 1988. zinc deficiency in rats and angiotensin-converting enzyme activity: comparative effects on lung and testis. *J. Nutr. 118(5): 622-6 .*
- No Oral** Reeves, Philip G. and Rossow, Kerry L. exposure to excessive parenteral zinc and/or cisplatin affects trace element metabolism and enzyme activities in reproductive tissues and kidney of male rats. *J. Nutr. Biochem. (1992) 3(9): 467-73.*
- Mix** Reeves, Philip G. and Rossow, Kerry L. 1996. zinc- and/or cadmium-induced intestinal metallothionein and copper metabolism in adult rats. *J. Nutr. Biochem. 7(3): 128-34 .*
- Nut def** Reeves, Philip G. and Rossow, Kerry L. zinc deficiency affects the activity and protein concentration of angiotensin-converting enzyme in rat testes. *Proc. Soc. Exp. Biol. Med. (1993) 203(3): 336-42.*
- No Oral** Reeves, Philip G. and Saari, Jack T. effect of cis-diamminedichloroplatinum(ii) on metallothionein induction and trace element metabolism in rats fed different amounts of dietary zinc. *J. Nutr. Biochem. (1990) 1(7): 374-81.*
- Nut def** Reeves, Philip G. and Stallard, Lana. zinc deficiency reduces the activity of angiotensin-converting enzyme in testicular germ cells and sperm of adult rats. *J. Trace Elem. Exp. Med. (1995) Volume Date 1994, 7(3): 125-34.*
- IMM** Reffett, J. K., Spears, J. W., Hatch, P. A., and Brown, T. T. 1986. influence of selenium and zinc on performance, blood-constituents, and immune-response in stressed calves. *Biological Trace Element Research 9(3): 139-149.*
- FL** Regiusne Mocsenyi, A. Allattenyesztesi es Takarmanyozasi Kutatokozpont Herceghalom Hungary Takarmanyozasi Kutatointezet . 1990. the zn, mn, cu, mo, ni and cd state of supply in cattle, sheep and horses. 1. the zinc supply. <original> a szarvasmarha, juh es lo zn-, mn-, cu-, mo-, ni-es cd-ellatottsaga. 1. a cinkellatottsag. *Allattenyesztes Es Takarmanyozas. V. 39(3) P. 255-270*
- Phys** Rehbein Steffen(A), Neubert Eckhard, and Bienioschek Sven. 1999. hematological and clinical chemical analysis in naturally and motherless raised fallow deer (dama dama l.): 2. part: clinical chemical study of blood plasma. *Zoologische Garten 69(2): 89-108.*
- No Oral** Rehm, Sabine and Waalkes, Michael P. cadmium-induced ovarian toxicity in hamsters , mice , and rats. *Fundam. Appl. Toxicol. (1988) 10(4): 635-47.*
- FL** Rehner, G., Heil, M., Auge, M., Harzer, G., and Daniel, H. effect of proteins on availability of zinc. i. gastrointestinal transit time of casein and whey protein and zinc absorption in weaned

rats. *Z. Ernaehrungswiss.* (1985) 24(4): 245-55.

- FL** Rehner, G. and Walter, T. effect of maillard products and lysinoalanine on the bioavailability of iron, copper, and zinc. *Z. Ernaehrungswiss.* (1991) 30(1): 50-5 .
- FL** Reichlmayr-Lais, A. M. and Kirchgessner, M. 1994. [concentration of different fatty acids in the liver and brain of rats after insufficient zinc supply]. <original> konzentrationen verschiedener fettsauren in leber und gehirn von ratten nach mangelhafter zn-versorgung. *Archiv Fur Tierernahrung* 46(3): 255-60.
- Nut def** Reichlmayr-Lais, A. M. and Kirchgessner, M. concentrations of different fatty acids in liver and brain of rats after alimentary zn deficiency . *Arch. Anim. Nutr.* (1994) 46(3): 255-260.
- FL** Reichlmayr-Lais, A. M. and Kirchgessner, M. 1981. <translated> contents of iron, copper, and zinc in newborns and in liver and spleen of growing rats in nutritional lead deficiency. eisen-, kupfer- und zinkgehalte in neugeborenen sowie in leber und milz wachsender ratten bei alimentarem blei-mangel. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde.* = ; *Journal Of Animal Physiology And Animal Nutrition.* 46 (1/2): 8-14.
- FL** Reichlmayr-Lais, Anna M. and Kirchgessner, M. 1981. contents of iron, copper, and zinc in newborns and in liver and spleen of growing rats with alimentary lead deficiency. *Z. Tierphysiol. Tierernaehr. Futtermittelkd.* 46(1-2): 8-14.
- Unrel** Reid, G. 1993. metabolic disorders of cattle. *Medical Hypotheses* 40(5): 296-300.
- Unrel** Reid, G. M. and Tervit, H. sudden infant death syndrome: hypothalamic failure to sense elevated blood pyrogens. *Med. Hypotheses* (1999) 52(6): 569-575.
- HHE** Reid, G. M. and Tervit, H. 1999. sudden infant death syndrome: oxidative stress. *Medical Hypotheses* 52(6): 577-80.
- No COC** Reid, R. L., Daniel, K., and Bubar, J. D. 1974. mineral relationships in sheep and goats maintained on orchardgrassfertilized with different levels of nitrogen, or nitrogen withmicro-elements, over a five-year period. 565-575.
- Surv** Reid, R. L., Jung, G. A., Post, A. J., Horn, F. P., Kahle, E. B., Bubar, J. D., and Daniel, K. 1974. effect of nitrogen and micro-element fertilization on quality of pasture and on the health, nutritional status and reproductive performance of sheep. *Journal of Animal Science* 38(1): 163-171.
- Plant** Reid, R. L., Jung, G. A., Stout, W. L., and Ranney, T. S. 1987. effects of varying zinc concentrations on quality of alfalfa for lambs. *Journal of Animal Science* 64(6): 1735-1742.
- Rev** Reifen, R. 1997. nutrition and autoimmunity. *Israel Journal of Medical Sciences* 33(4): 269-272.
- FL** Reim, M., Lukow, K., and Weber, H. 1989. [enzyme activities of the retina and vitreous body following experimental implantation of a brass splinter]. <original> enzymaktivitaten in retina und glaskorper nach experimenteller implantation eines messingsplitters. *Klinische Monatsblätter Fur Augenheilkunde* 195(6): 363-7.
- Nut def** Reimann, E. M., Sunde, M. L., and Hoekstra, W. G. 1971. effect of zinc, certain related dietary factors and age on the histamine content of chick tissues. *Journal of Nutrition* 101(12): 1623-9.

- BioX** Rein, A., Ott, D. E., Mirro, J., Arthur, L. O., Rice, W. G., and Henderson, L. E. 1997. suppression of retroviral replication: inactivation of murine leukemia virus by compounds reacting with the zinc finger in the viral nucleocapsid protein. *Leukemia* 11 Suppl 3: 106-8.
- Nut def** Reinhold, J. G., Kfoury, G. A., and Arslanian, M. 1968. relation of zinc and calcium concentrations in hair to zinc nutrition in rats. *Journal of Nutrition* 96(4): 519-24.
- Nut def** Reinhold, J. G., Kfoury, G. A., and Thomas, T. A. 1967. zinc, copper and iron concentrations in hair and other tissues: effects of low zinc and low protein intakes in rats. *Journal of Nutrition* 92(2): 173-82.
- Fate** Reinhold, J. G., Pascoe, E., Arslanian, M., and Bitar, K. 1970. relation of zinc metalloenzyme activities to zinc concentrations in tissues. *Biochimica Et Biophysica Acta* 215(3): 430-7.
- CP** Reinhold, J. G., Pascoe, Enid, Arslanian, M., and Bitar, K. 1970. zinc concentrations and enzyme activities of rat tissues during the initial stages of zinc depletion. *Trace Elem. Metab. Anim. Proc. WAAP World Ass. Anim. Prod./IBP (Int. Biol. Progr.) Int. Symp.* Meeting Date 1969, 143-50. Editor(s): Mills, Colin F. Publisher: Livingstone, London, Engl..
- Nut** Reinhold, John G. and Faqih, A. M. experimental evaluation of the availability of zinc in iranian lavosh and tonok and lebanese markouk breads for growth of rats. *Pahlavi Med. J. (1970)* 1(3): 255-677.
- CP** Reinhold, John G. and Kfoury, George A. 1967. relation of zinc and calcium concentrations in hair to zinc nutrition in rats. *Symp. Hum. Nutr. Health Near East Proc., 3rd* : 85-93.
- Nut def** Reinhold, John G. and Kfoury, George A. zinc-dependent enzymes in zinc-depleted rats ; intestinal alkaline phosphatase. *Amer. J. Clin. Nutr. (1969)* 22(9): 1250-63.
- Nut def** Reinhold, John G., Kfoury, George A., and Arslanian, Michael. relation of zinc and calcium concentrations in hair to zinc nutrition in rats. *J. Nutr. (1968)* 96(4): 519-24.
- Nut def** Reinhold, John G., Kfoury, George A., and Thomas, Teresa A. zinc, copper, and iron concentrations in hair and other tissues: effects of low zinc and low protein intakes in rats. *J. Nutr. (1967)* 92(2): 173-82 .
- CP** Reinstein, N. H., Keen, C. L., Goudeylefevre, J., Lefevre, M., Lonnerdal, B., Schneeman, B. O., and Hurley, L. S. 1984. effect of dietary copper and zinc levels on tissue cu, zn and fe in male weanling rats. *Federation Proceedings* 43: 687.
- Abstract** Reinstein, N. H., Lonnerdal, B., Keen, C. L., Schneeman, B. O., and Hurley, L. S. concentration and localization of zinc in bile-pancreatic fluid with varying dietary zinc. *70TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 13-18, 1986. FED PROC.* 45 (4). 1986. 1083.
- Fate** Reinstein, N. H., Lonnerdal, B., Keen, C. L., Schneeman, B. O., and Hurley, L. S. 1987. the effect of varying dietary zinc levels on the concentration and localization of zinc in rat bile-pancreatic fluid. *The Journal Of Nutrition.* 117(6): 1060-1066.
- Nut def** Reinstein, Nancy H., Lonnerdal, Bo, Keen, Carl L., and Hurley, Lucille S. zinc-copper interactions in the pregnant rat : fetal outcome and maternal and fetal zinc, copper and iron. *J. Nutr. (1984)* 114(7): 1266-79.
- Alt** Reinstein, Nancy H., Lonnerdal, Bo, Keen, Carl L., Schneeman, Barbara O., and Hurley, Lucille S. the effect of varying dietary zinc levels on the concentration and localization of zinc in rat

bile-pancreatic fluid. *J. Nutr.* (1987) 117(6): 1060-6 .

- Abstract** Reis, B. L. and Evans, G. W. resistance to neo natal zinc deficiency in an undesignated strain of mice. *Proceedings of the North Dakota Academy of Science.* 29 (1). 1975 25
- Mineral** Reis, B. L., Keen, C. L., Lonnerdal, B., and Hurley, L. S. 1991. longitudinal changes in the mineral composition of mouse milk and the relationship to zinc metabolism of the suckling neonate . *The Journal Of Nutrition.* 121(5): 687-699.
- Bio Acc** Reis, B. L., Keen, C. L., Lonnerdal, B., and Hurley, L. S. 1988. mineral composition and zinc metabolism in female mice of varying age and reproductive status. *The Journal Of Nutrition.* 118(3): 349-361.
- Mineral** Reis, B. L., Keen, C. L., Lonnerdal, B., and Hurley, L. S. mineral status of mice suckling early-lactating mid-lactating and late-lactating foster dams. *Journal of Nutrition.* 121 (5). 1991. 700-710.
- Abstract** Reis, B. L., Keen, C. L., Lonnerdal, B., and Hurley, L. S. whole body turnover and tissue distribution of zinc-65 in mice as a function of physiologic state. *68TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 1-6, 1984 FED PROC.* 43 (3). 1984. Abstract 2349.
- Nut def** Reis, Brenda L. and Evans, Gary W. genetic influence on zinc metabolism in mice. *J. Nutr.* (1977) 107(9): 1683-6.
- Mineral** Reis, Brenda L., Keen, Carl L., Lonnerdal, Bo, and Hurley, Lucille S. longitudinal changes in the mineral composition of mouse milk and the relationship to zinc metabolism of the suckling neonate. *J. Nutr.* (1991) 121(5): 687-99.
- No Oral** Reis, Brenda L., Keen, Carl L., Lonnerdal, Bo, and Hurley, Lucille S. mineral composition and zinc metabolism in female mice of varying age and reproductive status. *J. Nutr.* (1988) 118(3): 349-61 .
- Mineral** Reis, Brenda L., Keen, Carl L., Lonnerdal, Bo, and Hurley, Lucille S. mineral status of mice suckling early-, mid- and late-lactating foster dams. *J. Nutr.* (1991) 121(5): 700-10
- Diss** Reis, Brenda Leah. 1987. a kinetic study of zinc metabolism throughout the life cycle of the mouse. *Avail.: Univ. Microfilms Int. Order No. DA8729965 From: Diss. Abstr. Int. B 1988, 48. 11. 3253.* 341 pp.
- Unrel** Reis, P. J. and Sahlu, T. 1994. the nutritional control of the growth and properties of mohair and woolfibers: a comparative review. *Journal of Animal Science* 72(7): 1899-1907.
- Phys** Reiter, R. and Wendel, A. 1985. relation of glutathione-peroxidase and other hepatic enzyme modulations to dietary supplements. *Biochemical Pharmacology* 34(13): 2287-2290.
- FL** Rejto, G. 1971. supplements of minerals in feeds for pigs at weaning to prevent colienterotoxaemia. *Magyar Allatorvosok Lapja* 26(8): 445-446.
- Phys** Rekhman, N., Radparvar, F., Evans, T., and Skoultchi, A. I. 1999. direct interaction of hematopoietic transcription factors pu.1 and gata-1: functional antagonism in erythroid cells. *Genes & Development* 13(11): 1398-411.
- Nut** Ren, Dianxu, Yin, Shian, Xu, Qingmei, Hu, Shanming, Zhao, Xianfeng, and Meng, Jing. effect of different levels of ca, fe, and zn in diet on the nutritional status and reproduction of female

rats. *Yingyang Xuebao* (1999) 21(1): 28-33.

- QAC** Renan, M. J., Redpath, J. L., and Moffitt, L. A. 1981. the effect of dietary zinc on the survival of whole-body irradiated mice. *Radiation Research* 87: 383.
- Surv** RENZONI, A., FOCARDI, S., FOSSI, C., LEONZIO, C., and MAYOL, J. comparison between concentrations of mercury and other contaminants in eggs and tissues of cory's shearwater *calonectris-diomedea* collected on atlantic and mediterranean islands. *ENVIRON POLLUT SER A ECOL BIOL*; 40 (1). 1986. 17-36.
- In Vit** Rest, J. R. Dep. Animal Pathology Univ. Cambridge CB3 0ES UK. 1976. the histological effects of copper and zinc on chick embryo skeletal tissues in organ culture. *British Journal of Nutrition*. V. 36(2) P. 243-254
- Nut** Resurreccion, A. V., Doster, J. M., Wang, M., and Caster, W. O. 1981. the effect of copper and protein on iron metabolism in rats fed a cereal diet. *Science of the Total Environment* 20(1): 49-56.
- No Oral** Reuter, R., Bowden, M., Besier, B., and Masters, H. 1987. zinc responsive alopecia and hyperkeratosis in angora goats. *Australian Veterinary Journal* 64(11): 351-352.
- Unrel** Reuterving, C. O., Agren, M. S., Soderberg, T. A., Tengrup, I., and Hallmans, G. 1989. the effects of occlusive dressings on inflammation and granulation tissue formation in excised wounds in rats. *Scandinavian Journal of Plastic and Reconstructive Surgery and Hand*
- FL** Reutter, K. 1983. [roentgen microanalysis demonstration of zinc in the gustatory system of the bullhead, *ameiurus nebulosus* (teleostei)]. <original> rontgenmikroanalytische darstellung von zink im geschmackssystem des zwergwelses, *ameriurus nebulosus* (teleostei). *Acta Histochemica* 28: 243-8.
- Phys** Reveillaud, I., Niedzwiecki, A., Bensch, K. G., and Fleming, J. E. expression of bovine superoxide dismutase in *drosophila-melanogaster* augments resistance to oxidative stress. *Molecular and Cellular Biology*. 11 (2). 1991. 632-640.
- HHE** Reyes, A., Mercado, E., Goicoechea, B., and Rosado, A. 1976. participation of membrane sulfhydryl groups in the epididymal maturation of human and rabbit spermatozoa. *Fertility and Sterility* 27(12): 1452-8.
- CP** Reyners, H., Gianfelici de Reyners, E., Maisin, J. R., Winneke, G., and Csicsaky, M. 1981. effects of different heavy metals (cadmium, thallium, zinc, and lead) in the central nervous system: a morphological assay. *Heavy Met. Environ. Int. Conf., 3rd* : 495-7 Publisher: CEP Consult. Ltd., Edinburgh, UK.
- Abstract** Reynolds, P. response of sheep to high dietary copper and to marginally adequate or adequate dietary zinc. *73RD ANNUAL MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE, RALEIGH, N.C., USA, JULY 26-29, 1982. J ANIM SCI.* 53 (Suppl. 1). 1981 (Recd. 1982). 461.
- Abstract** Reynolds, P. J. effect of dietary zinc on high copper intake in sheep. *Journal of Animal Science*. 43 (1). 1976 331
- Nut def** Rezaian, M., Yamashiro, S., Hardy, M. H., and Bettger, W. J. 1994. mechanism of recovery in esophageal epithelia of rats with severe zinc deficiency. *J. Vet. Med. Ser. A* 41(9): 690-9.
- Alt** Rezende, A. A., Petenusci, S. O., Urbinati, E. C., and Leone, F. A. kinetic properties of osseous

- plate alkaline phosphatase from diabetic rats. *Comp. Biochem. Physiol. A: Comp. Physiol.* (1993): 104A(3), 469-74.
- Plant** Reznicek, Vojtech. zinc dust emission and its effect on amygdalaceous fruit-tree stock. *Acta Univ. Agric. Fac. Agron. (Brno)* (1980): 28(1), 111-19.
- Phys** Ribchester, R. R. and Taxt, T. 1983. motor unit size and synaptic competition in rat lumbrical muscles reinnervated by active and inactive motor axons. *Journal of Physiology* 344: 89-111.
- No COC** Ricci, A., Ramacci, M. T., Ghirardi, O., and Amenta, F. 1989. age-related changes of the mossy fibre system in rat hippocampus: effect of long term acetyl-L-carnitine treatment. *Archives of Gerontology and Geriatrics* 8(1): 63-71.
- Fate** Rice, D. P., Murthy, L., Shirley, T., Menden, E., and Petering, H. G. the impact of low level cadmium feeding on blood chemicals in male, sprague-dawley rats. *Trace Subst. Environ. Health* (1973) : 7, 305-11 .
- Unrel** Richards, M. P. 1994. application of a polyamine-coated capillary to the separation of metallothionein isoforms by capillary zone electrophoresis. *Journal of Chromatography* 657(2): 345-55.
- Rev** Richards, M. P. 1989. recent developments in trace element metabolism and function role of metallothionein in copper and zinc metabolism. *Journal of Nutrition.* 119(7): 1062-1070.
- No Tox** Richards, M. P. 1999. zinc, copper, and iron metabolism during porcine fetal development. *Biological Trace Element Research* 69(1): 27-44.
- Abstract** Richards, M. P., Bluestone, J. A., Newkirk, M. D., and Cousins, R. J. influence of zinc on the synthesis of a low molecular weight cytoplasmic zinc binding protein. *Federation Proceedings.* 33 (3 Part 1). 1974 699
- No Oral** Richards, M. P. and Cousins, R. J. isolation of an intestinal metallo thionein induced by parenteral zinc. *Biochemical and Biophysical Research Communications.* 75 (2). 1977 286-294.
- Abstract** Richards, M. P. and Cousins, R. J. isolation of intestinal zinc thionein proposed function in zinc absorption. *Federation Proceedings.* 36 (3). 1977 1079
- Phys** Richards, M P and Cousins, R J. metallothionein and its relationship to the metabolism of dietary zinc in rats. *J Nutr* Nov 1976 106 (1): 1591-1599. Ref.
- Abstract** Richards, M. P. and Cousins, R. J. role of metallo thionein in short-term metabolic responses to dietary zinc. *Federation Proceedings.* 35 (3). 1976 659
- No Control** Richards, M P and Cousins, R J. zinc-binding protein: relationship to short term changes in zinc metabolism [diet, rats]. *Proc Soc Exp Biol Med* Oct 1976 153 (1): 52-56. Ref.
- Mix** Richards, M. P. USDA ARS Livestock and Poultry Services Institute Nonruminant Nutrition Laboratory Building 200 Room 201 Beltsville Agricultural Research Center-East Beltsville MD 20705 USA. 1989. influence of egg production on zinc, copper and iron metabolism in the turkey hen (meleagris gallopavo). *Comparative Biochemistry and Physiology. A, Comparative Physiology.* V. 93(4) P. 811-817
- In Vit** Richards, Mark P. synthesis of a metallothionein-like protein by developing turkey embryos maintained in long-term, shell-less culture. *J. Pediatr. Gastroenterol. Nutr.* (1984) 3(1): 128-36.

- In Vit** Richards, Mark P. and Cousins, Robert J. metallothionein and its relation to the metabolism of dietary zinc in rats. *J. Nutr.* (1976) 106(11): 1591-9.
- Nut def** Richards, Mark P. and Cousins, Robert J. zinc-binding protein: relation to short term changes in zinc metabolism. *Proc. Soc. Exp. Biol. Med.* (1976) 153(1): 52-6.
- Drug** Richards, R. B., Depiazzi, L. J., and Gwynn, R. V. R. 1984. new developments in footrot control. *Journal of Agriculture - Western Australia* 25(3): 102-105.
- No Oral** Richards, R. J., Atkins, J., Marrs, T. C., Brown, R. F., and Masek, L. 1989. the biochemical and pathological changes produced by the intratracheal instillation of certain components of zinc-hexachloroethane smoke. *Toxicology* 54(1): 79-88.
- Nut** Richardson, D. C. and Zentek, J. 1998. nutrition and osteochondrosis. *Veterinary Clinics of North America, Small Animal Practice* 28(1): 115-135.
- Unrel** Richardson, J. H. and Drake, P. D. 1979. the effects of zinc on fatigue of striated muscle. *Journal of Sports Medicine and Physical Fitness* 19(2): 133-134.
- No COC** Richter, G., Kuhn, I., and Kohler, H. 1998. evaluation of the probiotic toyocerin for turkey fattening. *Muhle + Mischfuttertechnik* 135(10): 352-353.
- FL** Richter, G. Leipzig Univ. Jena Germany Sektion Tierproduktion und Veterinaermedizin. Wissenschaftsbereich Tierernaehrungschemie, Lemser, A., and Petzold, M. 1990. investigations on the use of rape seed meal with chickens and pullets of the laying strain. <original> untersuchungen zum einsatz von rapsextraktionsschrot bei kueken und junghennen der legerichtung. *Tierernaehrung Und Fuetterung, Erfahrungen, Ergebnisse, Entwicklungen.* (No.16) P. 166-173
- Nut def** Richter, K. D. and Zumkley, H. effect of zinc deficiency diet in rats with spontaneous hypertension (sh rats). *Aktuel. Ernaehrungsmed. Klin. Prax.* (1983) 8(3): 113-15.
- Nut def** Richter, K. D. and Zumkley, H. 1983. influence of zinc-deficiency diet in rats with spontaneous hypertension (sh rats). *Aktuelle Ernahrungsmedizin* 8(3): 113-115.
- Drug** Rickard, B. F. 1975. facial eczema; zinc responsiveness in dairy cattle. *New Zealand Veterinary Journal* 23(3): 41-42.
- Bio Acc** Rickard, W. H. and Sweany, H. A. 1975. *Radionuclides in Canada Goose Eggs.* CONF-750985-1
- Food** Ricketts, C. D. and Kies, C. 1994. iron bioavailability from super enriched breads in weanling mice. *Plant Foods Hum. Nutr. (Dordrecht Neth.)* 45(3): 277-85
- In Vit** Rickmann M(A) and Wolff, J. R. 1995. s100 protein expression in subpopulations of neurons of rat brain. *Neuroscience* 67(4): 977-991.
- No Oral** Ridgway, L. P. and Karnofsky, D. A. 1952. the effects of metals on the chick embryo: toxicity and production of abnormalities in development. *Ann N Y Acad Sci.* 55: 203-215.
- No COC** Riet, B. V., O'rear, C. E., and Smith, M. J. V. methylene blue and other agents as inhibitors of calcium oxa lithiasis in-vivo. *Investigative Urology.* 16 (3). 1978. 201-203.
- Rev** Rifkind, J. M. 1983. interaction of zinc with erythrocytes. *Metal Ions In Biological Systems* 15: 275-317.

- Alt** Riggio, Oliviero, Merli, Manuela, Capocaccia, Livio, Caschera, Massimo, Zullo, Angelo, Pinto, Giorgio, Gaudio, Eugenio, Franchitto, Antonio, Spagnoli, Roberta, and et al. zinc supplementation reduces blood ammonia and increases liver ornithine transcarbamylase activity in experimental cirrhosis. *Hepatology (St. Louis) (1992)* 16(3): 785-9 .
- Nut def** Riley, D. R., Harrill, I., and Gifford, E. D. 1969. influence of zinc and vitamin d on plasma amino acids and liver xanthine oxidase in rats. *Journal of Nutrition* 98(3): 351-5.
- Nut def** Riley, Doris R., Harrill, Inez, and Gifford, Elizabeth D. influence of zinc and vitamin d on plasma amino acids and liver xanthine oxidase in rats. *J. Nutr. (1969)* 98(3): 351-5 .
- BioX** Rimbach, G., Brandt, K., Most, E., and Pallauf, J. supplemental phytic acid and microbial phytase change zinc bioavailability and cadmium accumulation in growing rats. *J. Trace Elem. Med. Biol. (1995)* 9(2): 117-22.
- BioX** Rimbach, G., Ingelmann, H.-J., Brandt, K., Most, E., and Pallauf, J. 1994. effect of dietary phytate and microbial phytase on the zinc bioavailability and cadmium accumulation in growing rats. *Defizite Ueberschuesse Mengen- Spurenelem. Ernaehr. Jahrestag. Ges. Mineralstoffe Spurenelem., 10th* : 518-25. Editor(s): Anke, Manfred; Meissner, Dieter. Publisher: Verlag Harald Schubert, Leipzig, Germany.
- BioX** Rimbach, G. and Pallauf, J. effect of an addition of microbial phytase on zinc availability. *Z. Ernaehrungswiss. (1992)* 31(4): 269-77
- BioX** Rimbach, G. and Pallauf, J. enhancement of zinc utilization from phytate-rich soy protein isolate by microbial phytase. *Z. Ernaehrungswiss. (1993)* 32(4): 308-15
- BioX** Rimbach, G. and Pallauf, J. improvement of zinc availability from soy protein isolate by microbial phytase in growing rats. *Ber. Bundesforschungsanst. Ernaehr. (1993)(BFE-R-93-01, Bioavailability '93 Pt. 1)* : 295-8.
- Mix** Rimbach, G., Pfannmuller, C., Brandt, K., Most, E., and Pallauf, J. 1995. effect of phytic acid on cadmium accumulation and mineral bioavailability in growing rats fed high dietary zinc. *Vitam. Zusatzst. Ernaehr. Mensch Tier Symp., 5th* : 440-445. Editor(s): Schubert, Rainer; Flachowsky, Gerhard; Bitsch, Roland. Publisher: Friedrich-Schiller-Universitaet Jena, Biologisch-Pharmazeutische Fakultaet, Institut fuer Ernaehrung und Umwelt, Jena, Germany.
- CP** Rimbach, G., Walter, A., Most, E., and Pallauf, J. 1998. effect of dietary microbial phytase on the bioavailability of zinc and the accumulation of cadmium and lead in growing rats. <original> einfluss mikrobieller phytase auf die bioverfuegbarkeit von zink und die akkumulation von cadmium und blei bei wachsenden ratten. <original> proceedings of the society of nutrition physiology berichte der gesellschaft fuer ernahrungsphysiologie. *P. 100. No. 7*
- Food** Rimbach, G., Walter, A., Most, E., and Pallauf, J. effect of microbial phytase on zinc bioavailability and cadmium and lead accumulation in growing rats. *Food Chem. Toxicol. (1998)* 36(1): 7-12.
- CP** Rimbach, G. Giessen Univ. Germany Inst. fuer Tierernaehrung, Eidel, A., Most, E., Hoehler, D., Pallauf, J., and Gieseke, D. ed. 1993. effect of microbial phytase in a diet of corn starch and soya protein on the utilization of zinc in growing rats. <original> zur wirkung mikrobieller phytase auf die zinkverwertung wachsender ratten bei einer diaet aus maisstaerke und sojaprotein. proceedings of the society of nutrition physiology. <original> berichte der gesellschaft fuer ernahrungsphysiologie. *P. 24. V. 1*
- No COC** Rimbach, Gerald and Pallauf, Josef. cadmium accumulation, zinc status, and mineral

bioavailability of growing rats fed diets high in zinc with increasing amounts of phytic acid. *Biol. Trace Elem. Res.* (1997) 57(1): 59-70.

- CP** Ripley, P. H. and Brown, D. J. 1979. the effect of an antibacterial growth promoter on the levels of alkaline phosphatase (ec 3.1.3.1) in the intestinal mucosa of chicks. *Proceedings of the Nutrition Society* 38(1): 10A.
- Unrel** Ritchey, T. W., Lamster, I. B., Mann, P. H., and Alfano, M. C. 1982. the effect of zinc chloride on the development of gingivitis in beagle dogs treated with cetylpyridinium chloride. *Journal of Dental Research* 61(10): 1217-20.
- No COC** Rizzardini, M., Graziani, A., Carugo, C., and Cantoni, L. investigations on the role of free radical processes in hexachlorobenzene-induced porphyria in mice. *J. Biochem. Toxicol.* (1988) 3(Spring): 33-46 .
- No Tox** Robbins, N. and Fahim, M. A. 1985. progression of age changes in mature mouse motor nerve terminals and its relation to locomotor activity. *Journal of Neurocytology* 14(6): 1019-36.
- Nut** Roberson, Kevin D. and Edwards, Hardy M. Jr. effects of 1,25-dihydroxycholecalciferol and phytase on zinc utilization in broiler chicks. *Poult. Sci.* (1994) 73(8): 1312-26 .
- Abstract** Roberson, R. H. 1975. effect of silicate calcium phosphorus manganese and zinc on performance of broiler chicks. *Poultry Science.* 54 (5): 1810
- Nut** Roberts, D. C. and Samman, S. 1990. dietary protein and cholesterol metabolism--interaction of minerals. *Journal of Nutritional Science and Vitaminology* 36 Suppl 2: S119-24.
- Abstract** Roberts, E. S(A), Van Heugten E, Almond G(A), and Spears, J. W. 1999. effect of dietary zinc on growth performance and immune response of endotoxemic growing pigs. *Journal of Animal Science* 77(SUPPL. 1): 178.
- Abstract** Roberts, K. R., Stake, P. E., Miller, W. J., and Gentry, R. P. effect of dietary cadmium on zinc 65 metabolism in holstein calves. *Journal of Dairy Science.* 56 (5). 1973 647
- Phys** Roberts Todd J, Azain Michael J(A), Hausman Gary J, and Martin Roy J. 1994. interaction of insulin and somatotropin on body weight gain, feed intake, and body composition in rats. *American Journal of Physiology* 267(2 PART 1): E293-E299.
- Nut def** Robertson, A. 1987. effects of iron deficiency on metallothionein levels in the rat. ix + 68pp.
- HHE** Robertson, E. J. 1997. left-right asymmetry. *Vol. 275, No. 5304, P. 1280* Science (Wash.)
- CP** Robeson, B. L. and Martin, W. G. CS Agricultural Biochemistry West USA. 1978. taurine synthesis from sulfate in the rat induced by dietary zinc. *Federation Proceedings* 37(3): 537.
- Surv** ROBINSON, F. R., MASON, R. M JR, FULTON, R. M., MARTINEZ, M., and EVERSON, R. J. 1991. zinc toxicosis in a dog. *.CANINE PRACT;* 16 (3). 1991. 27-31 16(3): 27-31.
- Dead** Robinson, F. R., Sullivan, J. M., Brelage, D. R., Sommers, R. L., and Everson, R. J. 1999. comparison of hepatic lesions in veal calves with concentrations of copper, iron and zinc in liver and kidney. *Veterinary and Human Toxicology* 41(3): 171-174.
- Aquatic** Robinson, J. J. 1997. characterization of a metalloproteinase: a late stage specific gelatinase activity in the sea urchin embryo. *Journal of Cellular Biochemistry* 66(3): 337-45.

- Nut def** Robinson, L. K. and Hurley, L. S. 1981. effect of maternal zinc deficiency or food restriction on rat fetalpancreas. 1. procarboxypeptidase a and chymotrypsinogen. *Journal of Nutrition* 111(5): 858-868.
- Nut def** Robinson, L. K. and Hurley, L. S. effect of maternal zinc deficiency of food restriction on rat fetal pancreas. 2. insulin and glucagon. *The Journal Of Nutrition*. May 1981. v. 111 (5) p. 869-877. ill.
- Nut def** Robinson, Leann K. and Hurley, Lucille S. effect of maternal zinc deficiency or food restriction on rat fetal pancreas. i. procarboxypeptidase a and chymotrypsinogen. *J. Nutr. (1981)* 111(5): 858-68.
- Nut def** Robinson, Lynne J., Card, Robert T., Semple, Hugh A., and Paterson, Phyllis G. erythrocyte deformability in zinc deficiency measured as a function of shear stress in the ektacytometer. *J. Nutr. Biochem. (1998)* 9(8): 457-463.
- Unrel** Rodrigo, J., Hernandez, C. J., Vidal, M. A., and Pedrosa, J. A. 1975. vegetative innervation of the esophagus. iii. intraepithelial endings. *Acta Anatomica* 92(2): 242-58.
- FL** Rodriguez, E. M. and Gimenez, A. R. 1981. zinc-iodide-osmium procedures as markers of subcellular structures. i. standardization of staining of transmitter containing vesicles. *Zeitschrift Fur Mikroskopisch-Anatomische Forschung* 95(2): 257-75.
- In Vit** Rodriguez, J. Pablo and Rosselot Gaston. 1996. effects of zinc on structural characteristics of proteoglycans synthesized by proliferating and hypertrophic chondrocytes in culture. *FASEB Journal* 10(3): A531.
- No Tox** Rodriguez-Martinez, H., Kvist, U., Courtens, J. L., and Ploen, L. 1988. post-testicular nuclear changes in boar spermatozoa. (Paper No. 291): 3pp.
- Nut def** Rodriguez-Matas, M. C., Lisbona, F., Gomez-Ayala, A. E., Lopez-Aliaga, I., and Campos, M. S. influence of nutritional iron deficiency development on some aspects of iron, copper and zinc metabolism. *Lab. Anim. (1998)* 32(3): 298-306.
- Nut def** Rodriguez, P., Darmon, N., Chappuis, P., Candalh, C., Blaton, M. A., Bouchaud, C., and Heyman, M. 1996. intestinal paracellular permeability during malnutrition in guinea pigs: effect of high dietary zinc. *Gut* 39(3): 416-422.
- FL** Rodriguez Perez, A. P. and Ruiz Buitrago, C. 1967. [results of using the osmium-zinc-iodine method in the "glomus aorticum". references concerning the development of what is known about it]. <original> resultados obtenidos con el metodo al osmio-yoduro de cinc en el "glomus aorticum". referencia acerca del desarrollo de los conocimientos en torino al mismo. *Trabajos Del Instituto Cajal De Investigaciones Biologicas* 59: 199-241.
- FL** Rodriguez-Perez, A. P. and Ruiz-Buitrago, C. results with the zinc osmium iodide method in sections of the glomus aorticum the development of knowledge on the subject. *Trabajos Del Instituto Cajal De Investigaciones Biologicas*. 59 1967 199-241.
- Alt** Rodriguez-Yoldi, M.-C., Mesonero, J. E., and Rodriguez-Yoldi, M.-J. action of zinc on enzymic digestion and intestinal transport of sugar in the rabbit. *Res. Vet. Sci. (1994)* 57(1): 15-20 .
- Alt** Rodriguez Yoldi, M. C., Mesonero, J. E., and Rodriguez Yoldi, M. J. 1996. effect of zinc on aminopeptidase n activity and l-threonine transport in rabbit jejunum. *Biological Trace Element Research*. 53(1/3): 213-223.

- FL** Rodriguez-Yoldi, Maria-Carmen, Mesonero, J E., and Rodriguez-Yoldi, Maria-Jesus. interaction between calcium and zinc on l-threonine absorption in rabbit jejunum. *Can. J. Physiol. Pharmacol.* (1995) 73(6): 724-8.
- Nut def** Roelfzema, W. H., Roelofsen, A. M., Leene, W., and Peereboom-Stegeman, H. J. 1989. effects of cadmium exposure during pregnancy on cadmium and zinc concentrations in neonatal liver and consequences for the offspring. *Archives of Toxicology* 63(1): 38-42.
- Aquatic** Roesijadi, G., Unger, M. E., and Morris, J. E. immunochemical quantification of metallothioneins of a marine mollusc. *Canadian Journal of Fisheries and Aquatic Sciences.* 45 (7). 1988. 1257-1263.
- Invert** Roesijadi, G., Unger, M. E., and Morris, J. E. 1988. immunochemical quantification of metallothioneins of a marine mollusk. *Can. J. Fish. Aquat. Sci.* 45(7): 1257-63 .
- Phys** Rofo, A. M., Philcox, J. C., Haynes, D. R., and Coyle, P. wasting in adjuvant-induced arthritis and its relationship to plasma zinc, copper and liver metallothionein. *Agents Actions* (1994) 42(1/2): 60-2 .
- Bio Acc** Rofo, A. M., Philcox, J. C., Haynes, D. R., Whitehouse, M. W., and Coyle, P. 1992. changes in plasma zinc, copper, iron, and hepatic metallothionein in adjuvant-induced arthritis treated with cyclosporin. *Biological Trace Element Research.* 34(3): 237-248.
- Surv** Roga-Franc, M., Kosla, T., Rokicki, E., and Miekus-Calak, I. Agricultural University Warsaw Poland Dept. of Animal Hygiene. 1988. estimation of health state of sheep on the basis of hematologic and biochemical indices of blood in different maintenance periods. *Annals of Warsaw Agricultural University SGGW-AR. Animal Science.* (No. 22) P. 35-40
- Nut def** Rogers, J. M. and Hurley, L. S. 1984. effects of maternal zinc-deficiency on development of the fetal-rat retina. *Teratology* 29: A55.
- Nut def** Rogers, J. M. and Hurley, L. S. 1987. effects of zinc deficiency on morphogenesis of the fetal rat eye. *Development* 99(2): 231-8.
- Abstract** ROGERS, J. M., KEEN, C. L., and HURLEY, L. S. the teratogenic effects of zinc deficiency in the long evans hooded rat. *TERATOLOGY* 27(2):73A,1983
- CP** Rogers, J. M., Keen, C. L., Reinstein, N., and Hurley, L. S. 1984. maternal zinc nutriture during pregnancy and lactation in the rat - survivability and growth of offspring. *Federation Proceedings* 43: 1052.
- Nut def** Rogers, J. M., Lonnerdal, B., Hurley, L. S., and Keen, C. L. 1987. iron and zinc concentrations and 59fe retention in developing fetuses of zinc-deficient rats. *Journal of Nutrition* 117(11): 1875-82.
- Nut def** Rogers, J. M., Sulik, K. K., Taubeneck, M. W., Zucker, R. M., Elstein, K. H., and Keen, C. L. cell death and cell cycle distributions in rat embryos following varying lengths of zinc deficiency: neural crest cells are killed by short-term deficiency. *Teratology* 1991 May;43(5):469
- Nut def** Rogers, John M. and Hurley, Lucille S. 1987. effects of zinc deficiency on morphogenesis of the fetal rat eye. *Development (Cambridge UK)* 99(2): 231-8.
- Nut def** Rogers, John M., Keen, Carl L., and Hurley, Lucille S. zinc deficiency in pregnant long-evans hooded rats : teratogenicity and tissue trace elements. *Teratology* (1985) 31(1): 89-100

- Nut def** Rogers, John M., Lonnerdal, B., Hurley, Lucille S., and Keen, Carl L. iron and zinc concentrations and iron-59 retention in developing fetuses of zinc-deficient rats. *J. Nutr.* (1987) 117(11): 1875-82.
- Nut def** Rogers, John M., Taubeneck, Marie Weldon, Daston, George P., Sulik, Kathleen K., Zucker, Robert M., Elstein, Kenneth H., Jankowski, Margaret A., and Keen, Carl L. zinc deficiency causes apoptosis but not cell cycle alterations in organogenesis-stage rat embryos: effect of varying duration of deficiency. *Teratology* (1995) 52(3): 149-59
- Nut def** Roginski, E. E. 1976. zinc deficiency induced by lactalbumin-based diet. *Federation Proceedings* 35(3): 658.
- Nut def** Rohrer, S. R., Shaw, S. M., Born, G. S., and et, a. l. 1978. the material distribution and placental transfer of cadmium in zinc deficient rats. *BULLETIN OF ENVIRONMENTAL CONTAMINATION AND TOXICOLOGY* 19(5): 556-563.
- FL** Rojas L, I, Moya, A, Mc Dowell, L. R., Martin, F. G., and Conrad, J. H. 1995. [mineral nutrition status in a farm located in southwestern of venezuela]. <original> estado mineral de una finca en el sureste de los llanos de venezuela. *Zootecnia Tropical*. V. 12(2) P. 161-185
- No Tox** Rojkitikhun T(A), Einarsson S(A), Uvnas-Moberg, K., and Edqvist L-E. 1993. body weight loss during lactation in relation to energy and protein metabolism in standard-fed primiparous sows. *Journal of Veterinary Medicine Series A* 40(4): 249-257.
- Phys** Rokita, E., Cichocki, T., Divoux, S., Gonsior, B., Hoefert, M., Jarczyk, L., Strzalkowski, A., and Sych, M. 1990. proton microprobe studies of the mineralization process in selected organic matrixes. *Nucl. Instrum. Methods Phys. Res. Sect. B* B50(1-4): 217-20.
- Rev** Rolfs, Andreas and Hediger, Matthias A. metal ion transporters in mammals: structure, function and pathological implications. *J. Physiol. (Cambridge U. K.)* (1999): 518(1), 1-12.
- Alt** Rolfsen, R. M. and Erway, L. C. 1984. trace metals and otolith defects in mocha mice. *Journal of Heredity* 75(3): 159-62.
- Nut def** Romasz, R. S., Lemmo, E. A., and Evans, J. L. diet calcium, sex and age influences on tissue mineralization and cholesterol in rats. *Trace Subst. Environ. Health* (1977) : 11, 289-96.
- No Tox** Romeu, A., Alemany, M., and Arola, L. 1986. net transfer of essential metals from mother to fetus in the second half of pregnancy in the rat. *Biology of the Neonate* 49(4): 204-10.
- Bio Acc** Romeu, A., Arola, L., and Alemany, M. 1987. essential metal balance and retention during the second half of pregnancy in the rat. *Gynecologic and Obstetric Investigation* 23(1): 40-7.
- Carcin** Romeu, A., Arola, L., and Alemany, M. essential metals in tissues and tumor of inbred c57bl/6 mice during the infective cycle of lewis lung carcinoma. *Cancer Biochem. Biophys.* (1986) 9(1): 53-66.
- Phys** Romeyer Alain, Poindron Pascal(A), and Orguer Pierre. 1994. olfaction mediates the establishment of selective bonding in goats. *Physiology & Behavior* 56(4): 693-700.
- FL** Ronchi, B., Bernabucci, U., Lacetera, N., and Nardone, A. 1997. effects of heat stress on metabolic-nutritional status of holsteincows. *Zootecnica e Nutrizione Animale* 23(1): 3-15.
- Unrel** Ronchi, B., Bernabucci, U., Lacetera, N. G., Nardone, A., and Bertoni, G. 1995. effects of heat stress on metabolic status of friesland heifer calves. *Zootecnica e Nutrizione Animale* 21(4):

209-221.

- Anat** Rong, X. and Tian, L. morphology and sprouting of motor nerve terminals in cat differences between fast and slow muscles. *JEIPOU XUEBAO*. 17 (3). 1986 (Recd. 1987). 277-281.
- IMM** Ronnlund, R. D. and Suskind, R. M. 1983. iron, zinc, and other trace-elements effect on the immune-response. *Journal Of Pediatric Gastroenterology And Nutrition* 1983, V2, S1, Ps172-S180
- Nut def** Root, Allen W., Duckett, Gregory, Sweetland, Margaret, and Reiter, Edward O. 1979. effects of zinc deficiency upon pituitary function in sexually mature and immature male rats. *J. Nutr.* 109(6): 958-64 .
- Abstract** Root, J. L., Duckett, G. E., Livingston, K., Hsu, H., Root, A. W., and Sweetland, M. effect of zinc deficiency on secretion of growth hormone in the male rat. *ANNUAL MEETING OF THE SOUTHERN SOCIETY FOR PEDIATRIC RESEARCH, NEW ORLEANS, LA., USA, JAN. 16-17, 1981. CLIN RES.* 28 (5). 1980 (Recd. 1981). 867a.
- In Vit** Root, J. L., Duckett, G. E., Sweetland, M., Livingston, K., Hsu, H., and Root, A. W. 1980. effect of zinc-deficiency upon secretion of growth-hormone (gh) in the male-rat. *Clinical Research* 28: A867.
- Gene** Ros Maria A, Sefton Mark, and Nieto, M. Angela(A). 1997. slug, a zinc finger gene previously implicated in the early patterning of the mesoderm and the neural crest, is also involved in chick limb development. *Development (Cambridge)* 124(9): 1821-1829.
- Nut def** Rosa, G. de, Keen, C. L., Leach, R. M., and Hurley, L. S. 1980. regulation of superoxide dismutase activity by dietary manganese. *Journal of Nutrition* 110(4): 795-804.
- Phys** Rosati, Anna Maria and Traversa, Ugo. mechanisms of inhibitory effects of zinc and cadmium ions on agonist binding to adenosine a1 receptors in rat brain. *Biochem. Pharmacol.* (1999) 58(4): 623-632.
- No Oral** Rosenberg, Daniel W. and Kappas, Attallah. 1989. trace metal interactions in vivo: inorganic cobalt enhances urinary copper excretion without producing an associated zincuresis in rats. *J. Nutr.* 119(9): 1259-68 .
- No Oral** Rosenblatt, D. E. and Aronson, Arthur L. calcium ethylenediaminetetraacetate (caedta) toxicity: time- and dose-response studies on intestinal dna synthesis in the rat. *Exp. Mol. Pathol.* (1978) 28(2): 202-14.
- No Tox** Rosenfeld, Jeffrey, Zimmerman, Andrew W., and Friedrich, Victor L. Jr. 1983. altered brain copper and zinc content in quaking mice. *Exp. Neurol.* 82(1): 55-63 .
- Carcin** Rosenkilde, M. M., Kledal, T. N., Brauner-Osborne, H., and Schwartz, T. W. 1999. agonists and inverse agonists for the herpesvirus 8-encoded constitutively active seven-transmembrane oncogene product, orf-74. *Journal of Biological Chemistry* 274(2): 956-61.
- HHE** Rosoff, B. studies of zinc in normal and neoplastic prostatic tissues (rats, humans). *The Prostatic Cell : ; Structure And Function / ; Editors, Gerald P. Murphy, Avery A. Sandberg, James P. Karr.* p. 447-457.
- Carcin** Rosoff, B. and Diamond, E. J. 1982. effect of perphenazine on growth and zinc-65 uptake of the rat prostatic adenocarcinoma, r 3327. *Prostate* 3(6): 615-22.

- No COC** Rosoff, B. and Martin, C. R. 1971. the influence of thymectomy and sham operation on prostate gland responses of hooded rats to gonadotropins. *General and Comparative Endocrinology* 16(3): 484-92.
- Mix** Rosoff, Betty and Martin, Constance R. 1968. effect of gonadotropins and of testosterone on organ weights and zinc-65 uptake in the male rat. *Gen. Comp. Endocrinol.* 10(1): 75-84 .
- Unrel** Ross, G. M., Shamovsky, I. L., Lawrance, G., Solc, M., Dostaler, S. M., Jimmo, S. L., Weaver, D. F., and Riopelle, R. J. 1997. zinc alters conformation and inhibits biological activities of nerve growth factor and related neurotrophins. *Nature Medicine* 3(8): 872-8.
- Unrel** Ross, J. F. and Lawhorn, G. T. 1990. zpt-related distal axonopathy: behavioral and electrophysiologic correlates in rats. *Neurotoxicology and Teratology* 12(2): 153-9.
- Abstract** Ross, J. Ministry of Agriculture Fisheries and Food Sand Hutton York UK, Page, R. J. C., Nadian, A. K., and Langton, S. D. the development of a carbon monoxide producing cartridge for rabbit. *Wildl Res.* V25, N3, P305(10)
- Nut def** Ross, Penny K., Noordewier, Byron, Hook, Jerry B., and Bond, Jenny T. zinc deficiency and the kidney. i. effect on renal carbonic anhydrase activity. *Miner. Electrolyte Metab.* (1982) 7(5): 257-64.
- No Dose** Rosser, B. W. C. and George, J. C. 1986. molt-induced muscle atrophy decreases the zinc content of the pectoralis of the giant canada goose (*branta canadensis maxima*). *Experientia* 42(5): 549-550.
- Nut def** Rossi, L., Branca, F., Migliaccio, S., Paoletti, F., <Editors> Battistini, N., and Branca, F. 1999. mechanical properties of bone in rats with dietary zinc deficiency. *Rivista Di Scienza Dell'Alimentazione* 28(3suppl.): S21-S24.
- Meth** Rossi, L., Marchese, E., De Martino, A., Rotilio, G., and Ciriolo, M. R. 1997 . purification of a fully metal-depleted cu, zn superoxide dismutase from copper-deficient rat liver. *Biometals* 10(4): 257-62.
- CP** Rossi L(A), Migliaccio, S., Branca, F., Marzia, M., and Teti, A. 1997. effect on zinc deprivation on skeletal growth and development of young rats. *Bone (New York)* 20(4 SUPPL.): 68S.
- Nut def** Rossow, Kerry L. and Reeves, Philip G. enzyme-linked immunosorbent assay for angiotensin-converting enzyme in rat testes. *J. Nutr. Biochem.* (1993) 4(6): 373-82.
- CP** Rossowska, M. and Nakamoto, T. 1996. caffeine's effects on trace elements in dams' milk and activity of antioxidant enzymes in liver of newborn rats. *FASEB Journal* 10(3): A790.
- FL** Rossowska, M. J., Carvajal, W., Joseph, F. Jr., and Nakamoto, T. 1997. postnatal caffeine effects on copper, zinc, and iron concentrations in mammary gland, milk, and plasma of lactating dams and their offspring. *Annals Of Nutrition & Metabolism.* 41(1): 60-65.
- Drug** Rossowska, M. J., Ghanaei, P., and Nakamoto, T. 1995. effect of dietary caffeine and zinc on the activity of antioxidant enzymes, zinc, and copper concentration of the heart and liver in fast-growing rats. *Biological Trace Element Research.* 50(3): 229-236.
- CP** Rossowska, M. J. and Nakamoto, T. 1995. caffeine's effects on zn, cu concentration in the liver and heart during growth. *FASEB Journal* 9(3): A456.
- Drug** Rossowska, M. J. and Nakamoto, T. 1990. effect of caffeine on zinc absorption and zn

concentration in rat tissue. *The British Journal Of Nutrition*. 64(2): 553-559.

- FL** Rossowska, M. J. and Nakamoto, T. effects of chronic caffeine feeding on the activities of oxygen free radical defense enzymes in the growing rat heart and liver. *Experientia* (1994) 50(5): 465-8.
- Drug** Rossowska, Magdalena J., Dinh, Chantal, Gottschalk, Sheila B., Yazdani, Malektaj, Sutton, Fletcher S. III, and Nakamoto, Tetsuo. interaction between caffeine intake and heart zinc concentrations in the rat. *Br. J. Nutr.* (1990) 64(2): 561-7.
- No Oral** Rossowska, Magdalena J. and Nakamoto, Tetsuo. caffeine decreases zinc and metallothionein levels in heart of newborn and adult rats. *Pediatr. Res.* (1992) 32(3): 330-2.
- Bio Acc** Rossowska, Magdalena J. and Nakamoto, Tetsuo. interaction between zinc and calcium in skeletal muscle in young growing rats. *Biol. Trace Elem. Res.* (1993) 38(3): 301-9 .
- Abstract** Rosychuk, R. A. 1989. llama dermatology. *Veterinary Clinics of North America. Food Animal Practice* 5(1)
- In Vit** Roth-Bassell, Helen A. and Clydesdale, Fergus M. the influence of zinc, magnesium, and iron on calcium uptake in brush border membrane vesicles. *J. Am. Coll. Nutr.* (1991) 10(1): 44-9 .
- FL** Roth, F. X., Kirchgessner, M., Grassmann, E., and Tschierschwitz, A. mineral and trace element content of rats with dietary fumaric-acid supply. . *Zeitschrift Fuer Tierphysiologie Tierernaehrung Und Futtermittelkunde*. 48 (1-2). 1982. 16-20.
- FL** Roth, F. X., Kirchgessner, M., Grassmann, E., and Tschierschwitz, A. 1982. mineral and trace element contents of rats given fumaric acidsupplements in the feed. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde* 48(1/2): 16-20.
- FL** Roth, F. X., Kreuzer, M., and Kirchgessner, M. 1988. effect of free phosphoric acid added to complete diets for piglets and pigs on the metabolism of some minerals (p, ca, k, na, mg, zn). *Journal of Animal Physiology and Animal Nutrition* 59(5): 247-254.
- Abstract** Roth H-P. influence of zinc deficiency on some parameters of energy metabolism. *35TH MEETING OF THE GESELLSCHAFT FUER ERNAHRUNGSPHYSIOLOGIE DER HAUSTIERE (SOCIETY FOR NUTRITIONAL PHYSIOLOGY OF DOMESTIC ANIMALS), GOETTINGEN, WEST GERMANY, MAR. 25-27, 1981. Z TIERPHYSIOL TIERERNAEHR FUTTERMITTELKD*. 45 (5). 1981. 225-226.
- FL** Roth, H. P. and Kirchgessner, M. 1974. activity changes of different dehydrogenases and alkaline phosphatase in serum under zinc-depletion and -repletion. 6. zinc metabolism in animals. *Z. Tierphysiol. Tierernaehr. Futtermittelk.* 32(6): 289-96.
- FL** Roth, H. P. and Kirchgessner, M. 1974. activity duration of various dehydrogenases in rat liver at different levels of zinc. 8. metabolism of zinc in animal organisms. *Z. Tierphysiol. Tierernaehr. Futtermittelk.* 33(1): 1-9.
- FL** Roth, H. P. and Kirchgessner, M. 1974. [activity of pancreatic carboxypeptidase a and b during zinc depletion and repletion. 10. metabolism of zinc in the animal organism]. <original> zur aktivitat der pankreas-carboxypeptidase a and b bei zink-depletion und -repletion. 10 zum stoffwechsel des zinkes im tierischen organismus. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde*;
- Nut def** Roth H-P and Kirchgessner, M. angiotensin-converting enzyme activity in rats with

experimentally induced zinc deficiency. *Trace Elements in Medicine.* 4 (2). 1987. 51-56.

- FL** Roth, H. P. and Kirchgessner, M. 1974. blood carbonic anhydrase activity during zinc deficiency in growing rats . 7. zinc metabolism in animals. *Z. Tierphysiol. Tierernaehr. Futtermittelk.* 32(6): 296-300.
- Nut def** Roth, H. P. and Kirchgessner, M. calmodulin activity in tissues of zinc- and calcium-deficient rats. *J. Trace Elem. Electrolytes Health Dis.* (1991) 5(3): 213-17.
- Nut def** Roth, H. P. and Kirchgessner, M. calmodulin, zinc and calcium concentration in tissues of zinc- and calcium-deficient rats. *J. Trace Elem. Electrolytes Health Dis.* (1988) 2(2): 73-8.
- FL** Roth H-P and Kirchgessner, M. contents of growth hormone in serum of zinc deficient rats *Zeitschrift Fuer Tierphysiologie Tierernaehrung Und Futtermittelkunde.* 47 (4). 1982. 197-200.
- FL** Roth, H. P. and Kirchgessner, M. 1982. contents of somatotropin in the serum of rats in zinc deficiency. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde* 47(4): 197-200.
- FL** Roth, H. P. and Kirchgessner, M. 277. contents of zinc and chromium in serum, pancreas and liver of zinc-deficient rats after stimulation with glucose. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde*
- FL** Roth, H. P. and Kirchgessner, M. course of concentration changes of growth hormone, igf-1, insulin, and c-peptide in serum, pituitary and liver of zinc-deficient rats. *J. Anim. Physiol. Anim. Nutr.* (1997) 77(2): 91-101.
- FL** Roth, H. P. and Kirchgessner, M. 1974. [de- and repletion study of zinc in the bones and liver of growing rats]. <original> de- und repletionsstudien an zink in kinochen und leber wachsender ratten. *Archiv Fur Tierernahrung* 24(4): 283-98.
- FL** Roth, H. P. and Kirchgessner, M. 1981. dependence of delta -aminolaevulinic acid dehydratase on dietary zinc. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde* 46(1/2): 59-63.
- No Oral** Roth, H. P. and Kirchgessner, M. 1980. diagnosis of zinc deficiency by means of alkaline phosphatase activity before and after a zinc injection. *Zentralbl. Veterinaarmed. Reihe A* 27(4): 290-7.
- FL** Roth, H. P. and Kirchgessner, M. 1976. the effect of alkaline phosphatase injections in zinc deficiency. *Zentralbl. Veterinaarmed. Reihe A* 23(7): 578-87.
- Nut def** Roth, H. P. and Kirchgessner, M. effect of dietary fat on the resistance to hemolysis of erythrocyte membranes of zinc- or calcium-deficient rats. *Z. Ernaehrungswiss.* (1991) 30(2): 98-108.
- Nut def** Roth, H. P. and Kirchgessner, M. effect of dietary zinc, calcium or simultaneous deficiency on the osmotic fragility of rat erythrocyte membranes. *J. Anim. Physiol. Anim. Nutr.* (1991) 65(5): 273-80.
- FL** Roth, H. P. and Kirchgessner, M. 1983. effect of different concentrations of different zinc complexes (picolinate, citrate, 8-hydroxyquinolate) compared with sulphate on indices of zinc status in rats. *Zeitschrift Fur Ernahrungswissenschaft* 22(1): 34-44.
- FL** Roth, H. P. and Kirchgessner, M. 1985. [effect of the zn supply on alkaline ribonuclease activity

in rats]. <original> zum einfluss der zn-versorgung auf die aktivitat der alkalischen ribonuclease bei ratten. *Zeitschrift Fur Ernahrungswissenschaft* 24(2): 79-84.

- FL** Roth, H.-P. and Kirchgessner, M. 1974. (effect of varying the dietary zinc content on alkaline phosphatase activity in bones. (part 9 of the series: zinc metabolism in the animal body)). *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde* 33(Heft 2): 57-61.
- Nut def** Roth, H. P. and Kirchgessner, M. the effect of zinc deficiency on fat metabolism. *Int. J. Vitam. Nutr. Res.* (1977) 47(3): 277-83.
- FL** Roth, H. P. and Kirchgessner, M. effect of zinc supply on alkaline ribonuclease activity in rats. *Z. Ernaehrungswiss.* (1985) 24(2): 79-84.
- Nut def** Roth H-P and Kirchgessner, M. experimental studies on the diagnosis of marginal zinc deficiency. *Research in Experimental Medicine*. 174 (3). 1979. 283-300.
- FL** Roth, H. P. and Kirchgessner, M. 1982. growth hormone (gh) levels in zinc-deficient rats. *Z. Tierphysiol. Tierernaehr. Futtermittelkd.* 47(4): 197-200
- FL** Roth, H. P. and Kirchgessner, M. 1982. [growth hormone levels in rat serum in zinc deficiency]. <original> gehalte von wachstumshormon (gh) im rattenserum bei zn-mangel. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde*;
- Nut def** Roth, H.-P. and Kirchgessner, M. influence of alimentary zinc deficiency on the concentration of growth hormone (gh), insulin-like growth factor i (igf-i) and insulin in the serum of force-fed rats. *Horm. Metab. Res.* (1994) 26(9): 404-8
- Nut def** Roth, H.-P. and Kirchgessner, M. 1997. influence of alimentary zinc deficiency on the concentration of the second messenger d-myo-inositol-1,4,5-trisphosphate (ip3) in testes, brain and blood cells of force-fed rats. *Trace Elem. Man Anim.--9 Proc. Int. Symp., 9th* : Meeting Date 1996, 244-246. Editor(s): Fischer, Peter W. F. Publisher: National Research Council of Canada, Ottawa, Ont..
- Nut def** Roth, H.-P. and Kirchgessner, M. 1997. influence of alimentary zinc deficiency on the somatotrophic axis of rats. *Trace Elem. Man Anim.--9 Proc. Int. Symp., 9th* : Meeting Date 1996, 512-514. Editor(s): Fischer, Peter W. F. Publisher: National Research Council of Canada, Ottawa, Ont..
- Nut def** Roth H-P and Kirchgessner, M. influence of dietary fats on the osmotic fragility of erythrocytes in elementary zinc-deficiency and calcium-deficiency of the rat. *Zeitschrift Fuer Ernaehrungswissenschaft.* 30 (2). 1991. 98-108.
- FL** Roth, H. P. and Kirchgessner, M. 1974. [influence of various dietary zinc contents on the activity of alkaline phosphatase in bones. 9. on zinc metabolism in the animal organism]. <original> zum einfluss unterschiedlicher diatzinkgehalte auf die aktivitat der alkalischen phosphatase im knochen. 9. zum stoffwechsel des zinks im tierischen organismus. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde*;
- FL** Roth, H. P. and Kirchgessner, M. influence of zinc- and calcium deficiencies on the concentration of unsaturated fatty acids in the body fat of rats as a function of dietary fat. *J. Anim. Physiol. Anim. Nutr.* (1993) 70(4/5): 236-45.
- Nut def** Roth, H. P. and Kirchgessner, M. 1989. influence of zinc and calcium deficiency on the concentrations of calcitonin, parathyroid hormone, and 25-hydroxy-vitamin d3 in rat serum. *Journal of Trace Elements and Electrolytes in Health and Disease* 3(4)

- Nut def** Roth, H. P. and Kirchgessner, M. 1989. influence of zinc and/or calcium deficiency on prolactin concentration in rat serum. *Trace Elements in Medicine* 6(4): 139-141.
- Nut def** Roth H-P and Kirchgessner, M. the influence of zinc deficiency on fat metabolism. *INT J VITAM NUTR RES. International Journal for Vitamin and Nutrition Research.* 47 (3). 1977 277-283.
- FL** Roth, H. P. and Kirchgessner, M. 1998. influence of zinc deficiency on serum levels of gonadotropins, prolactins and testosterone in force-fed male rats. *Journal of Animal Physiology and Animal Nutrition* 78(4/5): 212-219.
- Nut def** Roth, H.-P. and Kirchgessner, M. influence of zinc deficiency on the osmotic fragility of erythrocyte membranes of force-fed rats. *Trace Elem. Electrolytes* (1994) 11(1): 46-50.
- FL** Roth H-P and Kirchgessner, M. influence of zinc supply on the activity of the alkaline mase in rats. *Z ERNAEHRUNGSWISS. Zeitschrift Fuer Ernaehrungswissenschaft.* 24 (2). 1985. 79-84.
- Nut def** Roth, H. P. and Kirchgessner, M. insulin content in the serum or plasma of zinc-deficient rats before and after glucose stimulation. *Int. J. Vitam. Nutr. Res.* (1975) 45(2): 201-8.
- Nut def** Roth, H. P. and Kirchgessner, M. 1975. insulin in serum or plasma of zinc-deficient rats before and after glucose stimulation. *International Journal for Vitamin and Nutrition Research* 45(2): 201-208.
- FL** Roth, H. P. and Kirchgessner, M. 1974. metabolism of zinc in animals. 6. changes in activity of several dehydrogenases and alkaline phosphatase in serum during zinc depletion and repletion. *Zeitschrift Fur Tierphysiologie Tierernahrung Und Futtermittelkunde* 32(6): 289-296.
- CP** Roth, H. P. and Kirchgessner, M. 1982. nutritional zinc deficiency and metabolism of insulin and growth hormone. *Trace Elem. Metab. Man Anim. Proc. Int. Symp., 4th* : Meeting Date 1981, 334-7. Editor(s): Gawthorne, J. M.; Howell, J. McC.; White, C. L. Publisher: Springer, Berlin, Fed. Rep. Ger.
- FL** Roth H-P and Kirchgessner, M. on the activity of blood carbo anhydrase in growing rats with a zinc deficiency 7th report on the metabolism of zinc in animals. *Zeitschrift Fuer Tierphysiologie Tierernaehrung Und Futtermittelkunde.* 32 (6). 1974 296-300.
- FL** Roth H-P and Kirchgessner, M. on the effect of various degrees of zinc content in the diet on the activity of alkaline phosphatase in bone 9th report on zinc metabolism in animals. *Zeitschrift Fuer Tierphysiologie Tierernaehrung Und Futtermittelkunde.* 33 (2). 1974 57-61.
- FL** Roth, H. P. and Kirchgessner, M. process of zinc depletion and repletion in the bones and liver of growing rats. *Arch. Tierernaehr.* (1974) 24(4): 283-98.
- Nut def** Roth, H. P. and Kirchgessner, M. 1975. [serum and plasma insulin levels in zinc-deficient rats following glucose stimulation]. <original> insulingehalte im serum bzw. plasma von zinkmangelratten vor und nach glukosestimulierung. *International Journal for Vitamin and Nutrition Research* 45(2): 201-8.
- FL** Roth, H. P. and Kirchgessner, M. 1979. zinc and chromium levels of serum, pancreas and liver of zinc-deficient rats after glucose stimulation. *Z. Tierphysiol. Tierernaehr. Futtermittelkd.* 42(6): 277-86.
- FL** Roth, H. P. and Kirchgessner, M. zinc binding capacity of serum. a parameter for diagnosing marginal zinc deficiency. *Res. Exp. Med.* (1980) 177(3): 213-19.

- FL** Roth, H. P. and Kirchgessner, M. 1979. zinc deficiency and insulin metabolism. *Z. Tierphysiol. Tierernaehr. Futtermittelkd.* 42(6): 287-99.
- FL** Roth, H. P. and Kirchgessner, M. 1974. zinc depletion and repletion in bones and liver of growing rats. *Archiv Fur Tierernahrung* 24(4): 283-298.
- FL** Roth, H. P. and Kirchgessner, M. 1974. zinc metabolism in animals. 10. activity of the pancreas carboxypeptidase a and b during zinc depletion and repletion. *Z. Tierphysiol. Tierernaehr. Futtermittelk.* 33(2): 62-7.
- FL** Roth, H. P. and Kirchgessner, M. 1974. zinc metabolism in animals. 11. enzyme activity of dehydrogenases in muscular tissue of rats during zinc deficiency. *Z. Tierphysiol. Tierernaehr. Futtermittelk.* 33(2): 67-71.
- FL** Roth, H. P. and Kirchgessner, M. 1974. zinc metabolism in animals. 9. influence of varying the dietary zinc content on the activity of the alkaline phosphatase in bones. *Z. Tierphysiol. Tierernaehr. Futtermittelk.* 33(2): 57-61.
- FL** Roth, H. P. and Kirchgessner, M. 1980. [zn-binding capacity of serum. a parameter for diagnosing marginal zn deficiency (author's transl)]. <original> zn-bindungskapazität des serums. ein parameter zur diagnose von marginalem zn-mangel. *Research in Experimental Medicine* 177(3): 213-9.
- FL** Roth, H P and Kirchgessner, M. zum einfluss unterschiedlicher diatzinkgehalte auf die aktivitat der alkalischen phosphatase im knochen. 9. zum stoffwechsel des zinks im tierischen organismus; the influence of varying the dietary zinc content on the acitivity of the alkaline phosphatase in bones. 9. zinc metabolism in the animal organism. [rats]. *Z Tierphysiol Tierernahr Futtermittelkd* Apr 1974 33 (2): 57-61. Ref. Eng. sum.
- Nut def** Roth, H. P., Kirchgessner, M., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. influence of zinc deficiency on the osmotic fragility of erythrocytemembranes of force-fed rats. 154-158.
- Nut def** Roth, H. P., Kirchgessner, M., and Giesecke, D. ed. 1996. influence of alimentary zn-deficiency on the somatotrophic axis of rats. <original> einfluss von alimentaerem zn-mangel auf die somatotrope achse bei ratten. [proceedings of the society of nutrition physiology]. <original> berichte der gesellschaft fuer ernahrungsphysiologieund tier. P. 59. No. 5
- FL** Roth, H. P. and Kirchgessner, M. Technische Univ. Muenchen Freising Germany Inst. fuer Ernaehrungsphysiologie. 1996. influence of alimentary zn deficiency on the concentration of growth hormone (gh), insulin-like growth factor 1 (igf-1) and insulin in the serum of rats in dependence on food intake. <original> einfluss von alimentaerem zn-mangel auf die konzentration von wachstumshormon (gh), insulinaehnlichem wachstumsfaktor-1 (igf-1) und insulin im serum von ratten in abhaengigkeit von der Futteraufnahme. *Journal of Animal Physiology and Animal Nutrition.* V. 76(4-5) P. 180-190
- Nut** Roth, H.-P., Motz, C., and Kirchgessner, M. influence of long-term therapy with analgesics on zn status of growing rats. *Trace Elem. Electrolytes* (1995) Volume Date 1995, 12(3): 125-30 .
- FL** Roth, H. P., Schneider, U., and Kirchgessner, M. 1975. [effect of zinc deficiency on glucose tolerance]. <original> zur wirkung von zinkmangel auf die glukosetoleranz. *Archiv Fur Tierernahrung* 25(8): 545-9.
- FL** Roth, H. P., Schneider, Ursula, and Kirchgessner, M. effect of zinc depletion on glucose tolerance. *Arch. Tierernaehr.* (1975) 25(8): 545-9.

- FL** Roth, H. P. Technische Univ. Muenchen Freising Germany Inst. fuer Ernaehrungsphysiologie. 1991. [on the interdependence of the stability of the erythrocyte membrane on the zn and ca supply and the fatty acid pattern of the diet]. <original> zur abhaengigkeit der stabilitaet der erythrozytenmembran von der zn- und ca-versorgung bzw. dem diaet-fettsaeuremuster. *Journal of Animal Physiology and Animal Nutrition*. V. 66(3-4) P. 167
- FL** Roth, H. P. Technische Univ. Muenchen Freising Germany Inst. fuer Ernaehrungsphysiologie and Kirchgessner, M. 1991. effect of dietary zn, ca or simultaneous zn/ca deficiency on the osmotic fragility of rat erythrocyte membranes. <original> zur haemolyse-resistenz der erythrozytenmembran nach alimentaerem zn- oder ca-bzw. simultanem zn/ca-mangel bei der ratte. *Journal of Animal Physiology and Animal Nutrition*. V. 65(5) P. 273-280
- FL** Roth, H. P. Technische Univ. Muenchen Freising Germany Inst. fuer Ernaehrungsphysiologie and Kirchgessner, M. 1993. influence of zn- and ca-deficiency on the concentration of unsaturated fatty acids in the body fat of rats in dependence of dietary fat. <original> einfluss von zn- und ca-mangel in abhaengigkeit vom diaetfett auf die konzentration von ungesaettigten fettsaeuren im koerperfett der ratte. *Journal of Animal Physiology and Animal Nutrition*. V. 70(4-5) P. 236-245
- FL** Roth, H. P. ZERNA and Kirchgessner, M. 1983. <translated> effect of different concentrations of various zn (zinc) complexes (picolinate, citrate, 8-hydroxyquinolate) in comparison with sulfate on parameters of zn supply status in rats (nutritional requirements of laboratory animals). der einfluss unterschiedlicher konzentrationen an verschiedenen zinkkomplexen (picolinat, citrat, 8-hydroxychinolat) im vergleich zu sulfat auf parameter des zn-versorgungsstatus von ratten. *Zeitschrift Fur Ernährungswissenschaft* = ; *Journal Of Nutritional Sciences*. 22 (1): 34-44.
- FL** Roth, H. P. ZERNA and Kirchgessner, M. 1983. <translated> the influence of zinc deficiency of 3',5'-cyclic adenosine monophosphate levels and parameters of energy metabolism in the rat. zum einfluss von zn-mangel auf 3',5'-cyclo-amp-gehalte und parameter des energiestoffwechsels bei der ratte. *Zeitschrift Fur Ernährungswissenschaft* = ; *Journal Of Nutritional Sciences*. 22 (2): 116-123.
- Nut def** Roth, Hans Peter, Moser, Christian, and Kirchgessner, Manfred. subcellular distribution of protein kinase c (pkc) in erythrocytes and concentration of d-myo-inositol-1,4,5-trisphosphate (ip3) in platelets and monocytes of force-fed zinc-deficient rats. *Biol. Trace Elem. Res.* (1996) 53(1-3): 225-234.
- CP** Roth, P. and Kirchgessner, M. 1974. zinc metalloenzyme activities in response to depletion and repletion of zinc. *Trace Elem. Metab. Anim. Proc. Int. Symp.*, 2nd : Meeting Date 1973, 509-12. Editor(s): Hoekstra, W. G. Publisher: Univ. Park Press, Baltimore, Md.
- Drug** Rothe, S., Gropp, J., Weiser, H., and Rambeck, W. A. 1994. influence of vitamin c and zinc on copper-induced increased cadmiumretention in pig. *Zeitschrift Fur Ernährungswissenschaft* 33(1): 61-67.
- Nut def** Rothman, R. J., Leure-duPree, A. E., and Fosmire, G. J. zinc deficiency affects the composition of the rat adrenal gland. *Proceedings Of The Society For Experimental Biology And Medicine*. July 1986. v. 182 (3) p. 350-357. ill.
- FL** Rothuizen, J. and van den Ingh, T. S. 1998. [hepatitis in dogs; a review]. <original> hepatitis bij de hond; een overzicht. *Tijdschrift Voor Diergeneeskunde* 123(8): 246-52.
- No COC** Rothwell, N. J. and Stock, M. J. 1981. a role for insulin in the diet-induced thermogenesis of cafeteria-fed rats. *Metabolism: Clinical and Experimental* 30(7): 673-8.
- Nut** Rotter, B., Guenter, W., and Boycott, B. R. 1987. effect of dietary animal fat on the incidence of

sudden death syndrome in broiler chicks. *Nutrition Reports International* 36(2): 403-411.

- Nut** Rotter, B., Guenter, W., and Boycott, B. R. 1988. sudden death syndrome in broilers: influence of dietary fats on the incidence and tissue composition. *Nutrition Reports International* 38(2): 369-380.
- Nut** Rouach, H., Ribiere, C., Brissot, P., and Nordmann, R. free radical-related liver mitochondrial damage following experimental chronic iron overload. *Adv. Biosci. (Oxford) (1989)* Volume Date 1988, 76(Free Radicals Pathog. Liver Inj.): 235-43.
- Drug** Rouach, Helene, Houze, Pascal, Gentil, Monique, Orfanelli, Marie-Therese, and Nordmann, Roger. changes in some pro- and antioxidants in rat cerebellum after chronic alcohol intake. *Biochem. Pharmacol. (1997)* 53(4): 539-545.
- CP** Roughead, Z. K., Johnson, L. K., and Hunt, J. R. 1998. iron status and oxidative stress in rats as affected by interactions among dietary iron, zinc and copper. *FASEB Journal* 12(4): A219.
- CP** Roughead, Z. K. and Kunkel, M. E. 1987. the effect of developmental zinc-deficiency on bone alkaline-phosphatase in rat pups. *Federation Proceedings* 46: 594.
- Nut** Roughead, Zamzam K., Johnson, LuAnn K., and Hunt, Janet R. dietary copper primarily affects antioxidant capacity and dietary iron mainly affects iron status in a surface response study of female rats fed varying concentrations of iron, zinc and copper. *J. Nutr. (1999)* 129(7): 1368-1376.
- Diss** Roughead, Zamzam Kabiry. 1987. effects of developmental zinc deprivation on bone noncollagenous proteins and bone alkaline phosphatase activity in rat pups. Avail.: Univ. Microfilms Int. Order No. DA8811897 From: Diss. Abstr. Int. B 1989, 49. 8. 3116-17. 264 pp.
- Food** Rouseel, A. M., Ravel, A., Faure, P., Alary, J., and Favier, A. tofu consumption: effects on plasma lipids in rats. *J. Food Sci. (1992)* 57(4): 903-5, 912.
- Phys** Rouslin, W., Broge, C. W., and Chernyak, B. V. 1993. effects of zn^{2+} on the activity and binding of the mitochondrial atpase inhibitor protein, if1. *Journal of Bioenergetics and Biomembranes* 25(3): 297-306.
- Phys** Rouslin, William, Broge, Charles W., and Chernyak, Boris V. effects of zinc(2+) on the activity and binding of the mitochondrial atpase inhibitor protein, if1. *J. Bioenerg. Biomembr. (1993)* 25(3): 297-306.
- Unrel** Rouslin William(A), Broge Charles W, and Chernyak Boris V. 1993. effects of zinc on the activity and binding of the mitochondrial atpase inhibitor protein, if-1. *Journal of Bioenergetics and Biomembranes* 25(3): 297-306.
- Nut def** Roussel, A. M., Richard, M. J., Ravel, A., Villet, J., Alary, J., Favier, A., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. influence of zinc deficiency on rat fatty acid distribution and peroxidation. 571-572.
- FL** ROUSSEL, C. and TUCHMANN-DUPLESSIS, H. influence of alterations in the metabolism of sugar and lipids in the pregnant mouse. *C R HEBD ACAD SCI SER D* 274:2213-2216, 1972
- No Oral** Roventa, Ecaterina. 1972. role of zinc and copper in lipid and protein metabolism in rats. *Bul. Stiint. Inst. Pedagog., Baia-Mare, Ser. B* (4): 96-103.
- Unrel** Rowe, A. H. R. and Binnie, W. H. histological study of the peri apical tissues of incompletely

formed pulpless teeth filled with zinc preparations and with magnesium hydroxide. *Journal of Dental Research*. 53 (3). 1974 606-608.

- CP** Rowe, D. J., Faia, K., Fruci, J., Gorini, L., and Bobilya, D. J. 1997. albumin uptake into endothelial cells correlates with zinc uptake. *FASEB Journal* 11(3): A195.
- No Oral** Rowe, F. A. and Smith, W. E. 1972. effects of peripherally induced anosmia on mating behavior of male mice. *Psychonomic Science* 27(1): 33-34.
- Org Met** Rowe, F. P., Swinney, T., and Bradfield, A. 1978. trials of the rodenticide pyriminil (rh-787) against wild house mice (*mus musculus* l.). *Journal of Hygiene* 80(2): 315-319.
- Diss** ROWE, M. C. prenatal zinc deficiency and stress in the rat. *DISS ABSTR INT B* 39:3036,1979
- No COC** Rowland, N. and Stricker, E. M. 1982. effects of dopamine-depleting brain lesions on experimental hyperphagia in rats. *Physiology & Behavior* 28(2): 271-7.
- CP** Rowland, R. D. and Bray, D. J. cadmium retention in chicks effects of calcium vitamin d-3 and zinc. 69TH ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC. *POULT SCI*. 59 (7). 1980. 1657.
- In Vit** Rowles, Teresa K., Womac, Carolyn, Bratton, Gerald R., and Tiffany-Castiglioni, Evelyn. interaction of lead and zinc in cultured astroglia. *Metab. Brain Dis.* (1989) 4(3): 187-201.
- Gene** Rowlinson, S. W., Barnard, R., Bastiras, S., Robins, A. J., Senn, C., Wells, J. R., Brinkworth, R., and Waters, M. J. 1994. evidence for involvement of the carboxy terminus of helix 1 of growth hormone in receptor binding: use of charge reversal mutagenesis to account for calcium dependence of binding and for design of higher affinity analogues. *Biochemistry* 33(39): 11724-33 .
- Aquatic** Rowney A.C., Droste R.L., and MacRae C.R. 1986. sediment and ecosystem characteristics of a detention lake receiving urban runoff. *WATER POLLUT. RES. J. CAN* VOL. 21, NO. 4: pp. 460-473.
- Nut def** Roy, S. K. and Tomkins, A. M. 1989. the impact of experimental zinc deficiency on growth, morbidity and ultrastructural development of intestinal tissue. *Bangladesh Journal of Nutrition*. V. 2(2) P. 1-7
- BioX** Roza, A. M., Edmiston, C. E. Jr, Frantzides, C., Moore, G. H., Nowak, T. V., Johnson, C. P., and Adams, M. B. 1992. untreated diabetes mellitus promotes intestinal microbial overgrowth. *American Journal of Surgery* 163(4): 417-21.
- Alt** Roza, A. M., Pieper, G. M., Johnson, C. P., and Adams, M. B. 1995. pancreatic antioxidant enzyme activity in normoglycemic diabetic prone bb rats. *Pancreas* 10(1): 53-8.
- Abstract** Ruan, D. Y., Zhao, Y. M., Wu, Y., Chen, J. T., and Xu, Y. Z. lead-induced impairment of ltp and ppp in hippocampal dg and antagonistic role of zinc. *Abstr Soc Neurosci* 1996;22(Pt 3):1924
- Drug** Ruberg, R. L. 1984. role of nutrition in wound healing. *Surgical Clinics of North America* 64(4): 705-14.
- No Dose** Rubin, H. and Koide, T. early cellular responses to diverse growth stimuli independent of protein and rna synthesis. *Journal of Cellular Physiology*. 86 (1). 1975 47-58.
- In Vit** Rubin, Harry. inhibition of dna synthesis in animal cells by ethylene diamine tetraacetate, and its

reversal by zinc. *Proc. Nat. Acad. Sci. U. S.* (1972) 69(3): 712-16 .

- Drug** Rubin, M. I. 1974. *Chelated Trace Metals in Wound Repair*. <NOTE> Final Rept. 1 Jun 68-31 May 74
- No Dose** Rubio, L. A., Brenes, A., <Editors> Huisman, J., Poel, T. F. B. van der, and Liener, I. E. 1989. effects of raw and autoclaved faba beans (*vicia faba* l.) and faba bean fractions on the intestinal physiology and histological structure in chicks. 164-167.
- Fate** Rubio, L. A., Grant, G., Rahman, H., Dewey, P., and Pusztai, A. apparent absorption of ca, p and zn, and true absorption of 65zn in rats fed diets containing lupin (*lupinus angustifolius*) seed meal or its fractions. *Anim. Feed Sci. Technol.* (1994) 49(1-2): 93-102.
- Fate** Rubio, L. A., Grant, G., Rahman, H., and Pusztai, A. intestinal absorption of 65zn in growing rats fed diets containing faba bean or lupine seed meals as the only source of protein. *Ber. Bundesforschungsanst. Ernaehr.* (1993) (BFE-R-93-01, Bioavailability '93 Pt. 1) : 299-303.
- Fate** Rubio, Luis A., Grant, George, Dewey, Peter, Bremner, Ian, and Pusztai, Arpad. the intestinal true absorption of 65zn in rats is adversely affected by diets containing a faba bean (*vicia faba* l.) nonstarch polysaccharide fraction. *J. Nutr.* (1994) 124(11): 2204-11.
- Gene** Rublevskaya Inna and Maines Mahin D(A). 1994. interaction of fe-protoporphyrin ix and heme analogues with purified recombinant heme oxygenase-2, the constitutive isozyme of the brain and testes. *Journal of Biological Chemistry* 269(42): 26390-26395.
- In Vit** Rudnick, R. C. and Czarnecki-Maulden, G. L. 1988. development of a zinc-deficient diet for dogs - effect of processing on feeding value of spray-dried egg-white. *Faseb Journal* 2: A868.
- FL** Rudometkin, Ya. S. 1975. activity of respiratory chain enzymes and glutathione concentration in the muscle tissue and liver of chicks fed copper and zinc salts. *Biol. Akt. Veshchestva (Mikroelem. Vitam. Drugie) Rastenievod., Zhivotnovod. Med.* 53-4. Editor(s): Babin, Ya. A. Publisher: Sarat. S-kh. Inst., Saratov, USSR.
- In Vit** Rufener, C. and Dreifuss, J. J. 1970. selective zinc iodide-osmium tetroxide impregnation of synaptoid vesicles in the rat neurohypophysis. *Brain Research* 22(3): 402-5.
- Unrel** Ruff, M. D., <Editors> McDougald, L. R., Joyner, L. P., and Long, P. L. 1986. reasons for inadequate nutrient utilization during avian coccidiosis: a review. 169-185.
- No Oral** Rui, H., Haug, E., Mevag, B., Thomassen, Y., and Purvis, K. 1985. short-term effects of prolactin on prostatic function in rats with lisuride-induced hypoprolactinaemia. *Journal of Reproduction and Fertility* 75(2): 421-32.
- FL** Ruiter, N., Seemayer, N., and Manojlovic, N. 1977. [toxicity of lead chloride influenced by zinc ions in cultures of mouse macrophages (authors transl)]. *Zentralbl Bakteriologie [Orig B]* 164(1-2): 90-8.
- In Vit** Ruiz, Consuelo, Mendieta, Jesus, and Rodriguez, Adela Rosa. the electrochemical behavior of cd, zn thioneins depending on the solution ph using differential pulse polarography. *Anal. Chim. Acta* (1995) 305(1-3): 285-94 .
- Drug** Ruiz-Gutierrez Valentina, Perez-Espinosa Alonso, Vazquez Carmen Maria, and Santa-Maria Consuelo(A). 1999. effects of dietary fats (fish, olive and high-oleic-acid sunflower oils) on lipid composition and antioxidant enzymes in rat liver. *British Journal of Nutrition* 82(3): 233-241.

- Chem Meth** Rumessen, J. J. and Thuneberg, L. 1982. plexus muscularis profundus and associated interstitial cells. i. light microscopical studies of mouse small intestine. *Anatomical Record* 203(1): 115-27.
- Diss** Rummler, H. G. 1988. *Einflüsse Des Lebensalters Auf Das Kumulationsverhalten Von Cadmium, Zink Und Kupfer Bei Ratten Nach Cadmium-Belastung Ueber Das Trinkwasser. (Influence of Age on the Cumulation Behaviour of Cadmium, Zinc and Copper in Rats After Exposure to Cadmium Via the Drinking Water).* <NOTE> Diss. (Dr.Rer.Nat)
- Mix** Rummler, H. G., Classen, H. G., Schimatschek, H. F., Thoni, H., Schumacher, E., Schenkel, H., Vormann, J., and Gunther, T. 1989. age-dependent accumulation of cadmium in rats exposed to contaminated drinking water; interactions with zinc and copper and subcellular cd distribution in kidney cells. *Journal of Trace Elements and Electrolytes in Health and Disease* 3(4)
- Nut def** Rupic, V. Univ. of Zagreb Zagreb Croatia Fac. of Agric., Ivandija, L. PLIVA Chemic. and Pharmaceutical Works Res. and Development Zagreb Croatia, Luterotti, S. Univ. of Zagreb Zagreb Croatia Fac. of Pharmacy and Biochem., Dominis-Kramaric, M. PLIVA Chemi. and Pharmaceutical Works Res. and Development Zagreb Croatia, and Bozac, R. Univ. of Zagreb Zagreb Croatia Fac. of Agric. 1998. plasma proteins and haematological parameters in fattening pigs fed different sources of dietary zinc. *Acta Veterinaria Hungarica*. V. 46(1) P. 111-126
- FL** Rupic, V. University of Zagreb Croatia Faculty of Agriculture, Ivandija, L., Luterotti, S., and Dominis-Kramaric, M. 1997. influence of inorganic and organic dietary zinc on its concentration in blood serum, bones and hair and on catalytical activity of some serum enzymes in pigs. *Acta Veterinaria. Brno*. V. 66(2) P. 75-85
- FL** Rusakov, V. I., Rudakova Yu I, Zhuravleva, N. N., and Chuku, A. I. histophysiology of the adrenocortical structures and the langerhans islands of the pancreas in acute ileus. *Izvestiya Severo-Kavkazskogo Nauchnogo Tsentra Vyshei Shkoly Estestvennye Nauki*. 0 (4). 1984 (Recd. 1985). 87-91.
- Abstract** RUSSELL, J. B. and SCHWARTZ, R. 1987. effect of tricarballic acid a non-metabolizable metabolite of trans aconitic acid on magnesium calcium and zinc excretion. *71ST ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY*
- Unrel** Russell, J. R., Grove, D. M., and Cotton, W. R. 1967. *Pulp Response in Rat Molars to a New Restorative Material* : 13p.
- Nut def** Russell, R. M., Cox, M. E., and Solomons, N. 1983. zinc and the special senses. *Annals of Internal Medicine* 99(2): 227-39.
- Rev** Russell, Robert M., Cox, Michael E., and Solomons, Noel. zinc and the special senses. *Ann. Intern. Med.* (1983) 99(2): 227-39 .
- Plant** RUSSELLE, M. P. and MCGRAW, R. L. nutrient stress in birdsfoot trefoil lotus-corniculatus. *CAN J PLANT SCI*; 66 (4). 1986. 933-944.
- Unrel** Russo, M. de C, Holland, R., and Nery, R. S. [periapical tissue reactions of deciduous teeth to some root canal filling materials. histological study in dog. *Revista Da Faculdade De Odontologia De Aracatuba* 5(1-2): 163-77] CP- Materials --Adverse Effects --AE; *Tooth, Deciduous; Calcium Hydroxide --Adverse Effects --AE; Dogs; Formocresols --Adverse Effects - -AE; Histocytochemistry; Hydrocarbons, Iodinated --Adverse Effects --AE; Root Canal Obturation --Adverse Effects --AE; Tooth Root --Drug Effects --DE; Wound Healing; Zinc Oxide-Eugenol Cement --Adverse Effects --AE.

- In Vit** Russo, S. M., Pepe, J. A., Cable, E. E., Lambrecht, R. W., and Bonkovsky, H. L(A). 1994. repression of ala synthase by heme and zinc-mesoporphyrin in a chick embryo liver cell culture model of acute porphyria. *European Journal of Clinical Investigation* 24(6): 406-415.
- No Oral** Russo, S. M., Pepe, J. A., Donohue, S., Cable, E. E., Lambrecht, R. W., and Bonkovsky, H. L. 1995. tissue distribution of zinc-mesoporphyrin in rats: relationship to inhibition of heme oxygenase. *Journal of Pharmacology and Experimental Therapeutics* 272(2): 766-74.
- No Oral** Ruth, R. E. and Goldsmith, S. K. 1981. brief communication interaction between zinc deprivation and acute ethanol intoxication during pregnancy in rats. *Vol. 111, No. 11, Pp. 2034-2038 J. Nutr.*
- No COC** Ruth, R. E. and Goldsmith, S. K. 1981. interaction between zinc deprivation and acute ethanol intoxication during pregnancy in rats. *The Journal Of Nutrition.* 111 (11): 2034-2038.
- No Oral** Ruth, Russell E. and Goldsmith, Sara K. interaction between zinc deprivation and acute ethanol intoxication during pregnancy in rats. *J. Nutr. (1981)* 111(11): 2034-8.
- FL** Rutkowska-Pejsak, B., Mokrzycka, A., and Szkoda, J. 1998. effect of dietary zinc oxide supplementation on the health of weaned piglets. *Medycyna Weterynaryjna* 54(3): 194-200.
- FL** Rutkowska, U., Czarnowska-Misztal, E., Iwanow, K., Pietruszka, B., Trzebska-Jeske, I., and Kunachowicz, H. studies on the utilization of zinc from experimental diets by laboratory rats part ii. effect of dietary zinc level and protein source on zinc absorption and its content in the tissues and hair of rats. *Zywnienie Czlowieka i Metabolizm.* 13 (4). 1986 (Recd. 1987). 249-255.
- FL** Rutkowska, U., Czarnowska-Misztal, E., Iwanow, K., Wojtasik, A., Pietruszka, B., Klys, W., and Kunachowicz, H. 1991. evaluation of the availability of zinc from the daily diet of aselected population group in studies with laboratory animals. *Zywnienie Czlowieka i Metabolizm* 18(2): 90-98.
- FL** Rutkowska, Urszula, Czarnowska-Misztal, Elzbieta, Iwanow, Krystyna, Pietruszka, Barbara, Trzebska-Jeske, Irena, and Kunachowicz, Hanna. utilization of zinc from experimental diets by laboratory rats . ii. effect of dietary zinc level and protein source on zinc absorption and its content in the tissues and hair of rats. *Zywnienie Czlowieka Metab. (1986)* 13(4): 249-55.
- FL** Rutkowska, Urszula, Iwanow, Krystyna, Czarnowska-Misztal, Elzbieta, and Kunachowicz, Hanna. studies on the utilization of zinc from experimental diets by laboratory rats . part iii. effect of dietary zinc level and protein source on iron and copper absorption and their content in the tissues of rats. *Zywnienie Czlowieka Metab. (1987)* 14(3): 145-52.
- FL** Rutkowska, Urszula, Iwanow, Krystyna, Wojtasik, Anna, Czarnowska-Misztal, Elzbieta, Pietruszka, Barbara, and Kunachowicz, Hanna. utilization of zinc from experimental diets by laboratory rats . part vi. effect of different protein quality and optimal dietary zinc level on apparent zinc absorption and its content in the tissues of rats. *Zywnienie Czlowieka Metab. (1990)* 17(3): 162-70.
- FL** Rutkowska, Urszula, Wojtasik, Anna, Iwanow, Krystyna, Czarnowska-Misztal, Elzbieta, and Kunachowicz, Hanna. utilization of zinc from experimental diets by laboratory rats . part viii. effect of different protein quality and optimal dietary zinc level on apparent iron and copper absorption. *Zywnienie Czlowieka Metab. (1990)* 17(3): 181-7
- Nut** Ryabich, I. P. 1994. optimization of the standards for feeding dry cows. *Zootekhniya* (10): 17-19.

- Unrel** Ryan, D. M., Keusch, G., and Wadstroem, T. eds. 1983. experimental urinary tract infections in rats using foreign body implantation. relationship between size of foreign body and severity of infection. *EXPERIMENTAL BACTERIAL AND PARASITIC INFECTIONS*.: pp. 111-117.
- CP** Ryan, J. Philip(A), Kearns Pat(A), and Quinn Teresa(A). 2000. comparison of plasma zinc levels in sheep following supplementation with zinc sulphate and bioplex zinc. *Biochemical Society Transactions*. 28(1): A26.
- FL** Rybczynska, J. Szkola Glowna Gospodarstwa Wiejskiego Akademia Rolnicza Warszawa Poland Katedra Biochem. Zwierzat. 1984. influence of sodium sulphate as feed additive on serum levels of selenium, copper and zinc in young beef cattle. <original> wplyw stosowania siarczanu sodowego jako dodatku do paszy na zawartosc seleniu, miedzi i cynku w surowicy mlodego bydla rzeznego. *Nowosci Weterynarii*. V. 14(2) P. 178-185
- Unrel** Rybinska, K. 1977. effect of zinc bacitracin on the activity of some enzymes in rats. 1.values for aspartate and alanine aminotransferases in the liver andkidneys of rats. *Roczniki Panstwowego Zakladu Higieny* 28(2): 133-140.
- Unrel** Rybinska, K. 1977. effect of zinc-bacitracin on the activity of some enzymes in rats. 2.values for lysosomal hydrolases in the lysosomal fractions of theliver and kidneys of experimental animals. *Roczniki Panstwowego Zakladu Higieny* 28(3): 237-242.
- Drug** Ryde Ulf. 1996. the coordination chemistry of the structural zinc ion in alcohol dehydrogenase studied by ab initio quantum chemical calculations. *European Biophysics Journal* 24(4): 213-221.
- In Vit** Ryszka, F., Dolinska, Barbara, and Smorag, Z. 1993. influence of zinc concentration on the constitution and some properties of follitropin suspensions. *Pharmazie* 48(1): 46-47.
- Meth** Ryu Kwon-Yul, Baik Young-Jin, and Yang Chul-Hak(A). 1995. purification and characterization of farnesyl protein transferase from bovine testis. *Journal of Biochemistry and Molecular Biology* 28(3): 197-203.
- Nut def** Saari, Jack T. 1989. chronic treatment with dimethyl sulfoxide protects against cardiovascular defects of copper deficiency. *Proc. Soc. Exp. Biol. Med.* 190(1): 121-4.
- FL** Saba, L., Bialkowski, Z., Janecki, T., and Junkuszew, W. 1987. metabolic indices and fertility of cows in regions with mineraldeficiencies. *Annales Universitatis Mariae Curie-Sklodowska. Sectio DD, Medicina Veterinaria* 42: 95-102.
- FL** Saba, L., Bialkowski, Z., Klocek, B., Niedzwiadek, T., and Rozaniecka, K. 1988. mineral metabolism of young fattening cattle given mineral mixtures. *Roczniki Nauk Rolniczych. Seria B, Zootechniczna* 104(3): 39-50.
- No COC** Sabhlok, V. P. Pasahan S. C. Kumar P. and Singal R. K. 1997. evaluation of different rodenticidal baits against rodent population in cucumber (cucumis sativus) crop fields. *Indian J.Exp.Biol.* 35(6): 670-672.
- Nut** Sable-Amplis, R., Sicart, R., and Reynier, B. apparent retention of copper, zinc and iron in hamsters . influence of a fruit-enriched diet. *Nutr. Rep. Int. (1987)* 35(4): 811-18.
- Carcin** Sacchi, N., Tamanini, F., Willemsen, R., Denis-Donini, S., Campiglio, S., and Hoogeveen, A. T. 1998. subcellular localization of the oncoprotein mtg8 (cdr/eto) in neural cells. *Oncogene* 16(20): 2609-15.

- No Oral** SACERDOTE, F. L. and CAVICCHIA, J. C. refractoriness of the immature rat epididymis to the early cadmium lesion. *ULTRASTRUCTURAL PATHOLOGY*; 19 (3). 1995. 187-191.
- Nut def** Sadikova-Samarina, I. A. 1972. the accumulation of labelled zinc in bones and its excretion with faeces of ascaridia-infected chickens. *Trudy Vsesoyuznogo Instituta Gel'Mintologii Im. K.I. Skryabina* 19: 157-162.
- FL** Sadikova-Samarina, I. A. zinc balance in trichinella-infested rats. *Tr. Vses. Inst. Gel'Mintol.* (1975) : 22, 143-50.
- Unrel** Sadovsky, Y. and Crawford, P. A. 1998. developmental and physiologic roles of the nuclear receptor steroidogenic factor-1 in the reproductive system. *Journal of the Society for Gynecologic Investigation* 5(1): 6-12.
- Plant** Safaya, N. M. and Gupta, A. P. differential susceptibility of corn cultivars to zinc deficiency. *Agron. J.* (1979) 71(1): 132-6.
- No Oral** Safieh-Garabedian, Bared, Poole, Stephen, Allchorne, Andrew, Kanaan, Salim, Saade, Nayef, and Woolf, Clifford J. zinc reduces the hyperalgesia and upregulation of ngf and il-1.β. produced by peripheral inflammation in the rat. *Neuropharmacology* (1996) 35(5): 599-603.
- HHE** Sagane, K., Ohya, Y., Hasegawa, Y., and Tanaka, I. 1998. metalloproteinase-like, disintegrin-like, cysteine-rich proteins mdc2 and mdc3: novel human cellular disintegrins highly expressed in the brain. *Biochemical Journal* 334(Pt 1): 93-8.
- Org Met** Sahenk, Z. and Mendell, J. R. 1979. ultrastructural study of zinc pyridinethione-induced peripheral neuropathy. *Journal of Neuropathology and Experimental Neurology* 38(5): 532-50.
- CP** Sahin D(A), Ilbay G(A), Karson A(A), Esen N(A), and Ates N(A). 1999. the effect of ptz-induced seizure on trace elements in brain tissue. *Physiological Research* 48(SUPPL. 1): S113.
- No Oral** SAHU, S. C. and DOMINIC, C. J. effect of zinc sulfate-induced peripheral anosmia on the bruce effect in laboratory mice. *J ADV ZOOL*; 8 (1). 1987. 9-16.
- In Vit** Saillenfait, A. M., Languon, I., Sabate, J. P., and De Ceaurriz, J. interaction between mercuric chloride and zinc in rat whole-embryo culture. *Toxicol. in Vitro* (1990) 4(2): 129-36 CODEN: TIVIEQ; ISSN: 0887-2333.
- Bact** Saini, K. S., Byrne, C. R., Leish, Z., Pruss, C. A., Rigby, N. W., Brownlee, A. G., Nancarrow, C. D., and Ward, K. A. 1996. introduction and expression of the bacterial glyoxylate cycle genes in transgenic mice. *Transgenic Research* 5(6): 467-73.
- Drug** SAITO, H., SAKAI, T., UENO, K., and KITAGAWA, H. influence of maternal drug metabolism on the fetal toxicity induced by acetylsalicylic acid. *J TOXICOL SCI* 7:177-184,1982
- No COC** Saito, M. and Matsumoto, T. 1973. effects of dietary calcium and phosphorus levels on zinc absorption and turnover in the chick. *Japanese Journal of Zootechnical Science* 44(11): 554-558.
- FL** Saito, Mamoru and Matsumoto, Tatsuro. effects of dietary zinc level on carbohydrate metabolism in the chick. *Nippon Chikusan Gakkai-Ho* (1973) 44(12): 611-14 CODEN: NICKA3.
- No Oral** Saito, Mamoru and Matsumoto, Tatsuro. zinc metabolism in chicks. i. effect of dietary calcium on the metabolism of intramuscularly injected zinc-65. *Nippon Chikusan Gakkai-Ho*

(1969) 40(12): 513-19 CODEN: NICKA3.

- FL** Saito, Mamoru and Matsumoto, Tatsuro. zinc metabolism in chicks. iii. interrelations between zinc and calcium metabolism in chick organs. *Nippon Chikusan Gakkai-Ho* (1970) 41(11): 545-50
- FL** Saito, Mamoru and Matsumoto, Tatsuro. zinc metabolism in chicks. iv. effects of dietary zinc levels and alloxan or glucose injection on zinc and phosphorus metabolism in some organs. *Nippon Chikusan Gakkai-Ho* (1970) 41(12): 614-19.
- FL** Saito, Mamoru and Matsumoto, Tatsuro. zinc metabolism in chicks. v. effects of dietary calcium and phosphorus levels on zinc absorption and turnover in chicks. *Nippon Chikusan Gakkai-Ho* (1973) 44(11): 554-8.
- No Oral** Saito, Shigeru. limitations of zinc and metallothionein accumulation in rat livers following zinc administration. *Res. Commun. Mol. Pathol. Pharmacol.* (1995) 88(1): 99-106.
- Bio Acc** Saito, Sogo, Zeitz, Louis, Bush, Irving M., Lee, Richard, and Whitmore, Willet F. Jr. zinc content of spermatozoa from various levels of canine and rat reproductive tracts. *Am. J. Physiol.* (1967) 213(3): 749-52 .
- FL** Saito, Tatsuo, Wakui, Akira, Himori, Tatsumi, Ujiie, Shigeki, Sugawara, Nobuo, and Sugiyama, Zensuke. serum zinc content in tumor-bearing rats treated with anticancer drugs. *Tohoku J. Exp. Med.* (1979) 129(2): 111-21.
- CP** Saito, Tatuo, Ujiie, Shigeki, Yokoyama, Masakazu, Himori, Tatsumi, and Sugawara, Nobuo. 1978. studies on serum zinc content and anticancer effect by dietary zinc deficiency in tumor-bearing hosts. *Prev. Detect. Cancer [Proc. Int. Symp.]*, 3rd : Meeting Date 1976, Volume 1, Issue 2, 1713-28. Editor(s): Nieburgs, Herbert E. Publisher: Dekker, New York, N. Y..
- Meth** Sajjan, Mini P. and Kulkarni, Arun P. a simple and rapid method for hemoglobin removal from mammalian tissue cytosol by zinc sulfate and its application to the study of glutathione transferase. *Toxicol. Methods* (1997) 7(1): 55-73.
- Nut def** Sakaguchi, S. and Suita, S. effect of zinc-deficient diet on fetal rats. *Biomed. Res. Trace Elem.* (1990) 1(2): 203-4.
- CP** Sakaki, Y. and Yamashita, M. 1995. calcium release from intracellular calcium stores by ach and atp receptors in the embryonic chick retina. *Society for Neuroscience Abstracts* 21(1-3): 1377.
- Nut** Sakamoto, S. effects of dietary citrate and phytate on the calcium and zinc bioavailabilities in growing rats. *Biomed. Res. Trace Elem.* (1992) 3(2): 247-8.
- FL** Sakamoto, S. and Niiyama, Y. effects of protein sources and zinc levels in diets on zinc bioavailability. *Biomed. Res. Trace Elem.* (1991) 2(2): 201-2 .
- Nut def** Sakanashi, Tammy M., Keen, Carl L., Hong, Kyu H., Gershwin, M. Eric, and Fletcher, Mark P. alterations in the chemotactic and respiratory burst responses of peripheral blood neutrophils from zinc deficient rats. *J. Nutr. Immunol.* (1995) 3(3): 3-18.
- FL** Sakly, R., Hdhili, A., Achour, A., Barkia, A., Yaacoub, M., Kallal, Z., and Mbazzaa, A. 1991. [is sucrose a risk factor in calculus formation?]. <original> le saccharose est-il un facteur de risque de la lithogenese? *Annales D'Urologie* 25(4): 204-8.
- FL** Sakly, R., Zarrouk, K., Hedhili, A., Achour, A., and Mbazzaa, A. 1991. [study of anti-lithogenic

action of zinc sulfate in experimental lithiasis in the rat]. <original> etude sur l'action anti-lithogene de sulfate de zinc vis-a-vis de la lithiase experimentale chez le rat. *Annales D'Urologie* 25(5): 246-9.

- No Oral** Saksena, S., White, M. J., Mertzlufft, J., and Lau, I. 1983. prevention of cadmium-induced sterility by zinc in the male rat. *Contraception* 27(5): 521-30.
- No Oral** Saksena, Shiva, White, Mary Jo, Mertzlufft, John, and Lau, In Fai. prevention of cadmium-induced sterility by zinc in the male rat. *Contraception (1983)* 27(5): 521-30.
- In Vit** Sakurai, Hiroaki, Kikuchi, Kaoru, Tsuchiya, Tomofusa, Kanazawa, Hiroshi, and Tsuda, Masaaki. developmentally and regionally regulated alterations of octamer- and gc-box-binding activities during the postnatal development of mouse cerebellum. *Dev. Brain Res. (1991)* 61(2): 161-8 .
- Alt** Sakurai, Hiromu, Tsuji, Akihiro, Sano, Yoshiyuki, Masuyama, Nobuyuki, Asano, Hidetoshi, Suzuki, Keiji, and Nakajima, Katsuyuki. dietary copper (cu)- and age-dependent changes of cu-metallothionein in relation to the level of nitric oxide (no) in the liver of lec (long-evans cinnamon) rats. *J. Trace Elem. Exp. Med. (1997)* 10(2): 89-100 .
- Chem Meth** Sakurai, J. and Fujii, Y. 1987. purification and characterization of clostridium perfringens beta toxin. *Toxicon* 25(12): 1301-10.
- Bio Acc** Salantiu, D., Bogdan, A. T., Patrascu, M., Angi, E., and Morar, E. 1980. investigation of the zinc content of semen serum and hair of breedingbulls. *Buletinul Institutului Agronomic Cluj-Napoca, Zootehnie Si Medicina Veterinara* 34: 95-97.
- FL** Saldeen, T. 1969; (REF:19). on the protective action of zinc against experimental liver damage due to choline free diet or carbon tetrachloride. *Z. Ges. Exptl. Chir.;* 150(3): 251-9
- FL** Saldeen, Tom. protective action of zinc against experimental liver damage due to a choline-free diet or carbon tetrachloride. *Z. Gesamte Exp. Med. (1969)* 150(3): 251-9.
- Nut** Saleh, Ibrahim, A. M., and Yousri, R. M. 1992. the effect of dietary zinc, season and breed on semen quality and bodyweight in goats. *World Review of Animal Production* 27(1): 9-17.
- Nut def** Saleh, I. A., El-Samee, A. A. A., and Rakha, G. M. 1998. clinical studies on wool slip (alopecia) in sheep with reference tohaematological and biochemical changes. *Veterinary Medical Journal Giza* 46(1): 57-66.
- CP** Saleim, A. D., Hsu Fu, and Sayouti, S. A. 1978. the effect of some growth promoters as a supplement on broiler rations. *Proceedings of the Saudi Biological Society* (2): 139-148.
- FL** Salem, S. I., Coward, W. A., Lunn, P. G., and Hudson, G. J. response of the reproductive system of male rats to protein and zinc deficiency during puberty. *Ann. Nutr. Metab. (1984)* 28(1): 44-51.
- Mix** Salgado, Paulo Eduardo de Toledo, Lepera, Jose Salvador, Honorato de Oliveira, Georgino, and Larini, Lourival. 1985. changes in the enzyme activity of .delta.-aminolevulinic acid dehydratase (ala-d) in rat erythrocytes, provoked by drinking ad libitum water containing lead, zinc, copper and chromium. *Rev. Cienc. Farm. (Araraquara Braz.)* 7: 145-9 .
- Mix** Salgado, Paulo Eduardo de Toledo, Lepera, Jose Salvador, Honorato de Oliveira, Georgino, and Larini, Lourival. 1987. changes induced in the activity of .delta.-aminolevulinic acid dehydratase (alad) in the rat erythrocyte by metals. *Rev. Cienc. Farm. (Araraquara Braz.)* 8-9: 99-104 .

- No COC** Salganik, R. I., Mertvetsov, N. P., Gordienko, O. E., Chesnokov, V. N., and Semenova, L. A. 1974. impairment of induction of glycolytic enzymes and development of insulin resistance in rats as a result of continuous insulin treatment. *Acta Endocrinologica* 76(2): 319-31.
- No COC** Saljadic, M., Gabric, D., and Pokrajac, N. effect of insulin on sex differences in the intake of glucose solutions in rats. *Physiology & Behavior*. 21 (3). 1978 306-312.
- CP** Salman, Adel J., Fernandez, Raul, and McGinnis, James. zinc-65 secretion by the exocrine pancreas of chicks fed soybean meal. *Proc. Soc. Exp. Biol. Med.* (1973) 142(4): 1248-51.
- Unrel** Salman, M. A., Quinn, F., Dermody, J., Hussey, D., and Claffey, N. 1999. histological evaluation of repair using a bioresorbable membrane beneath a resin-modified glass ionomer after mechanical furcation perforation in dogs' teeth. *Journal of Endodontics* 25(3): 181-6.
- FL** Salobir, K., Salobir, J., Zgur, S., Skerjanec, M., Struklec, M., and Fajdiga, M. 1996. effects of zinc-bacitracin (nubatr(r)) and salinomycin (grosal(r)) on the performance, carcass traits and meat characteristics of fattening pigs. *Krmiva* 38(1): 3-10.
- FL** Salobir, K., Salobir, J., Zgur, S., Struklec, M. Ljubljana Univ. Slovenia Biotechnical Fac. Zootechnical Dept., Skerjanec, M. Emona Ihan Slovenia, and Fajdiga, M. Krka Novo Mesto Slovenia. 1995. effect of zinc-bacitracin (nubatr(r)) and salinomycin (grosal) on the performance, carcass traits and meat characteristics of fattening pigs. <original> vpliv cinkovega bacitrocina (nubatr(r)) in salinomicina (grosal) na pitovne in klavne lastnosti ter kakovost mesa pri prascih pitancih. *Sodobno Kmetijstvo*. V. 28(7-8) P. 347-350
- Mineral** alvatori, G., Oriani, G., Martemucci, G., Santamaria, P., Cerasuolo, D., Maiorano, G., and Pizzuti, G. P. variability factors of the mineral metabolic profile in sheep. *Rassegna Di Medicina Sperimentale*. 38 (7-8). 1991 (1992). 143-156.
- No Oral** Salvemini Daniela(A), Wang Zhi-Qiang, Wyatt Pamela S, Bourdon David M, Marino Margaret H, Manning Pamela T, and Currie Mark G. 1996. nitric oxide: a key mediator in the early and late phase of carrageenan-induced rat paw inflammation. *British Journal of Pharmacology* 118(4): 829-838.
- IMM** Salvin, S. B., Horecker, B. L., Pan, L. X., and Rabin, B. S. the effect of dietary zinc and prothymosin .alpha. on cellular immune responses of rf/j mice. *Clin. Immunol. Immunopathol.* (1987) 43(3): 281-8 .
- IMM** Salvin, S. B. and Rabin, B. S. 1984. resistance and susceptibility to infection in inbred murine strains. iv. effects of dietary zinc. *Cellular Immunology* 87(2): 546-52.
- QAC** Samak, M. A., El-Sayed, I. A., Hassan, A., and El-Magdoub, A. A. 1986. effect of zinc and selenium fortification of diet on hematological and biochemical parameters of fasciola infected ewes. *Egyptian Journal of Animal Production* 26(1): 79-90.
- Alt** Samak, M. A. Alexandria Univ. Egypt Faculty of Agriculture, El-Sayed, I. A., Hassan, A., and El-Magdoub, A. A. 1986. effect of zinc and selenium fortification of diet on hematological and biochemical parameters of fasciola infected ewes. *Egyptian Journal of Animal Production*. V. 26(1) P. 79-90
- CP** Samal, S. N. and Singh, S. effect of zinc sulfate on the developing brain of chick embryo. 29TH ANNUAL CONFERENCE OF THE ANATOMICAL SOCIETY OF INDIA, PATNA, INDIA., DEC. 27-29, 1980. *J ANAT SOC INDIA*. 30 (1). 1981. 45-46.
- CP** SAMARAWICKRAMA, G. 1988. mechanism of teratogenesis in acute cadmium poisoning.

INTERNATIONAL CONFERENCE ON INDUSTRIAL HEALTH AND THE VIIITH UOEH
(UNIVERSITY OF OCCUPATIONAL AND ENVIRONMENTAL HEALTH) INTERNATIONAL
SYMPOSIUM ON HEALTH SURVEILLANCE WORKERS

- No Oral** Samarawickrama, G. P. and Webb, M. 1979. acute effects of cadmium on the pregnant rat and embryo-fetal development. *Environ. Health Perspect.* 28: 245-9.
- Nut def** Samman, S. and Roberts, C. K. zinc and cholesterol metabolism. *Nutrition Research.* May 1988. v. 8 (5) p. 559-570. charts.
- Nut def** Samman, S. and Roberts, D. C. K. dietary copper and cholesterol metabolism. *Nutrition Research.* Sept 1985. v. 5 (6) p. 1021-1034. charts.
- Mix** Samman, S. and Roberts, D. C. K. 1988. the effect of zinc supplements on lipoproteins and copper status. *Atherosclerosis* 70(3): 247-252 .
- Mix** Samman, S. and Roberts, D. C. K. the importance of the non-protein components of the diet in the plasma cholesterol response of rabbits to casein. zinc and copper. *Br. J. Nutr. (1987)* 57(1): 27-33 .
- HHE** Samman, S. and Roberts, D. C. K. zinc supplements reduce ldl-cholesterol and synthesis of ldl. *Proc. Nutr. Soc. Aust. (1987)* : 12, 164 .
- IMM** Samochocka, Krystyna, Ryzewski, Jan, and Kossakowska, Maria. the anti-inflammatory and immunosuppressive activity of hepida-calcium and hepida-zinc complex compounds. *Arch. Immunol. Ther. Exp. (1988)* 36(3): 377-80.
- Not Avail** Sampson, J, Graham, R, and Hester, HR. 1942. studies on feeding zinc to pigs. *Cornell Vet.* 32: 225.
- Unrel** Samson, Herman H. and Diaz, Jaime. altered development of brain by neonatal ethanol exposure: zinc levels during and after exposure. *Alcohol.: Clin. Exp. Res. (1981)* 5(4): 563-9 CODEN: ACRSDM; ISSN: 0145-6008.
- Phys** Samuelson, D. A., Lewis, P. A., MacKay, E., and Whitley, R. D. 1999. the influence of aging and low zinc nutrition on the choroid in the pig: i. the melanocyte. *Veterinary Ophthalmology* 2(1): 27-34.
- CP** Samuelson Don(A), Fernandes Pearl R, Lewis Patricia(A), and Cousins Robertj. 1995. altered metal binding of ocular melanin in lethal milk (lm) mouse. *FASEB Journal* 9(4): A737.
- Nut** Samuelson Don A(A), Lewis Patricia A, Mackay Edward, and Whitley, R. David. 1999. the influence of aging and low zinc nutrition on the choroid in the pig: ii. the melanosome. *Veterinary Ophthalmology* 2(1): 35-45.
- Unrel** Samuelson Don A(A), Smith Patricia, Ulshafer Robert J, Hendricks Deloyg. , Whitley, R. David, Hendricks Haven, and Leone Nicholas C. 1993. x-ray microanalysis of ocular melanin in pigs maintained on normal and low zinc diets. *Experimental Eye Research* 56(1): 63-70.
- In Vit** Samuni, Yuval, Coffin, Deborah, DeLuca, Anne Marie, DeGraff, William G., Venson, David J., Ambudkar, Indu, Chevion, Mordechai, and Mitchell, James B. the use of zn-desferrioxamine for radioprotection in mice , tissue culture, and isolated dna. *Cancer Res. (1999)* 59(2): 405-409 CODEN: CNREA8; ISSN: 0008-5472.
- Alt** Sanada, H., Miyazaki, M., and Takahashi, T. 1980. regulation of tryptophan-niacin metabolism

in diabetic rats. *Journal of Nutritional Science and Vitaminology* 26(5): 449-459.

- No Org** Sanchez-Andres, J. V., Palop, J. J., Ramirez, C., Nacher, J., Molowny, A., and Lopez-Garcia, C. zinc-positive presynaptic boutons of the rabbit hippocampus during early postnatal development. *Dev. Brain Res.* (1997) 103(2): 171-183 .
- Drug** Sanchez, C. F., Cruz, L. L., and Savage, D. D. impact of ethanol liquid diet consumption versus oral intubation of ethanol on prenatal ethanol exposure-induced reductions in hippocampal mossy fiber zinc. *Alcohol Clin Exp Res* 1994 Apr;18(2):468
- BioX** Sanchez, E. F., Costa, M. I., Chavez-Olortegui, C., Assakura, M. T., Mandelbaum, F. R., and Diniz, C. R. 1995. characterization of a hemorrhagic factor, lhf-i, isolated from the bushmaster snake (*Lachesis muta muta*) venom. *Toxicon* 33(12): 1653-67.
- Unrel** Sanchez-Quevedo, M. C., Crespo, P. V., Garcia, J. M., and Campos A(A). 1992. x-ray histochemistry of zinc in dental tissues. *European Archives of Biology* 103(1): 47-49.
- Lead Shot** SANDERSON, G. C., ANDERSON, W. L., FOLEY, G. L., SKOWRON, L. M., BRAWN, J. D., and SEETS, J. W. acute toxicity of ingested bismuth alloy shot in game-farm mallards. *ILLINOIS NATURAL HISTORY SURVEY BULLETIN*; 35 (3-4). 1997. 183-215.
- No Oral** Sandrock, B. C., Kern, S. R., and Bryan, S. E. 1983. the movement of zinc and copper from the fertilized egg into metallothionein-like proteins in developing chick hepatic tissue . *Biological Trace Element Research* 5(6): 503-515.
- Bio Acc** Sandrock, Balzer C., Kern, Sidney R., and Bryan, Sara E. the movement of zinc and copper from the fertilized egg into metallothionein-like proteins in developing chick hepatic tissue. *Biol. Trace Elem. Res.* (1983) 5(6): 503-15.
- CP** Sandstead, H. H. neurobiology of zinc. *The Neurobiology Of Zinc : Proceedings, Symposium, Society For Neuroscience, Boston, Massachusetts, November 4-6, 1983 / Editors, C.j. Frederickson, G.a. Howell, E.j. Kasarskis.* v. 11B p. 1-16.
- Nut def** Sandstead, H. H. 1985. w.o. atwater memorial lecture. zinc: essentiality for brain development and function. *Nutrition Reviews* 43(5): 129-37.
- Drug** Sandstead, H. H. 1989. zinc treatment of wilsons-disease. *Journal Of Laboratory And Clinical Medicine* 114(6): 615-616.
- CP** Sandstead, H. H., Al-Ubaidi, Y. Y., Halas, E., and Fosmire, G. zinc deficiency during the critical period for brain growth. *HOEKSTRA, W. G. ET AL. (ED.). TRACE ELEMENT METABOLISM IN ANIMALS, NO. 2. PROCEEDINGS OF THE SECOND INTERNATIONAL SYMPOSIUM. MADISON, WIS., U.S.A., JUNE 18-22, 1973. XXVI+775P. ILLUS. UNIVERSITY PARK PRESS: BALTIMORE, MD., U.S.A.; LONDON, ENGLAND. ISBN 0-8391-0696-3. 1974 745-748*
- CP** Sandstead, H. H. and Brady, R. N. brain growth in zinc deficient rats. *WHITE, PHILIP L. AND NANCY SELVEY (ED.). WESTERN HEMISPHERE NUTRITION CONGRESS 3. SYMPOSIUM. MIAMI BEACH FLORIDA, U.S.A., AUG. 30-SEPT. 2, 1971. XVI+389P. ILLUS. FUTURA PUBLISHING CO., INC: MOUNT KISCO, N.Y., U.S.A. 1972 341*
- CP** Sandstead, H. H., Fosmire, G., Halas, E., Strobel, D., and Duerre, J. 1978. zinc: brain and behavioral development. *Trace Elem. Metab. Man Anim. Proc. Int. Symp., 3rd : Meeting Date 1977, 203-6. Editor(s): Kirchgessner, M. Publisher: Arbeitskreis Tierernaehrungsforschung Weihenstephan Inst. Ernaehrungsphysiol., Freising-Weihenstephan, Ger. CODEN: 40FLAC.*

- CP** Sandstead, H H, Fosmire, G, Halas, E, Strobel, D, and Duerre, J. zinc: brain and behavioral development [maternal nutrition during gestation for normal growth of fetus, rats; reprinted from trace element metabolism in man and animals, international symposium, freising, federal republic of germany, m. kirchgessner, ed.]. *U S Agric Res Serv (Reprints Of Articles By Ars Employees)* July 1977 3rd: 203-206. Ref.
- Nut def** Sandstead, H H, Fosmire, G J, and Halas, E S. effects of zinc deficiency on the infant rat which are associated with abnormal adult behavior. *In Proceedings Western Hemisphere Nutrition Congress* 1974 (pub. 1975) 4th: 353.
- Nut def** Sandstead, H. H., Fosmire, G. J., Halas, E. S., Jacob, R. A., Strobel, D. A., and Marks, E. O. zinc deficiency: effects on brain and behavior of rats and rhesus monkeys. *Teratology* (1977) 16(2): 229-34 CODEN: TJADAB.
- Nut def** Sandstead, H. H. and Glasser, S. R. fetal growth and zinc-65 uptake in zinc deficient rats. *CLIN RES. Clinical Research.* 17 (3). 1969 549
- Nut def** SANDSTEAD, H. H., GLASSER, S. R., and GILLESPIE, D. D. zinc deficiency, effect on fetal growth, zinc concentration and 65 zinc uptake. *FED PROC FED AM SOC EXP BIOL* 29:297, 1970
- Abstract** Sandstead, H. H., Glasser, S. R., and Gillespie, D. D. zinc deficiency effect on fetal growth zinc concentration and zinc 65 uptake. *Federation Proceedings.* 29 (2). 1970 297
- Abstract** Sandstead, H. H., Lanier, V. C., and Shepard, G. H. effect of zinc deficiency on wound healing. *CLIN RES. Clinical Research.* 17 (2). 1969 277
- Nut def** Sandstead, H. H. and Rinaldi, R. A. 1969. impairment of deoxyribonucleic acid synthesis by dietary zinc deficiency in the rat. *Journal of Cellular Physiology* 73(1): 81-3.
- Nut def** Sandstead, H. H. and Shepard, G. H. 1968. the effect of zinc deficiency on the tensile strength of healing surgical incisions in the integument of the rat. *Proceedings of the Society for Experimental Biology and Medicine*; 128
- CP** Sandstead, H. H. and Terhune, M. W. zinc deficiency effect on the activity of liver rna polymerase sucrose density gradients and in-vivo uridine incorporation. *PORIES, WALTER J. ET AL (ED.). CLINICAL APPLICATIONS OF ZINC METABOLISM. PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM. CLEVELAND, OHIO, U.S.A. OCT. 29-30, 1971. XVI+302P. ILLUS. CHARLES C THOMAS PUBLISHER: SPRINGFIELD, ILL., U.S.A. ISBN 0-398-02968-7. 1974 (1975) 9-18*
- CP** Sandstead, Harold H., Al-Ubaidi, Y. Y., Halas, E., and Fosmire, Gary. 1974. zinc deficiency during the critical period for brain growth. *Trace Elem. Metab. Anim. Proc. Int. Symp., 2nd* : Meeting Date 1973, 745-8. Editor(s): Hoekstra, W. G. Publisher: Univ. Park Press, Baltimore, Md. CODEN: 29IIAN.
- Nut def** Sandstead, Harold H., Fosmire, Gary J., McKenzie, Joan M., and Halas, Edward S. 1975. zinc deficiency and brain development in the rat. *Fed. Proc. Fed. Am. Soc. Exp. Biol.* 34(1): 86-8 CODEN: FEPA7.
- Nut def** Sandstead, Harold H., Lanier, Verne C. Jr., Shephard, Glenn H., and Gillespie, David D. zinc and wound healing. effects of zinc deficiency and zinc supplementation. *Amer. J. Clin. Nutr.* (1970) 23(5): 514-19.
- Nut def** Sandstead, Harold H. and Rinaldi, Robert A. impairment of deoxyribonucleic acid synthesis by

dietary zinc deficiency in the rat. *J. Cell. Physiol.* (1969) 73(1): 81-3 .

- Prim** Sandstead, Harold H., Strobel, David A., Logan, George M. Jr., Marks, Edward O., and Jacob, Robert A. zinc deficiency in pregnant rhesus monkeys : effects on behavior of infants. *Am. J. Clin. Nutr.* (1978) 31(5): 844-9.
- HHE** Sandstroem, Brittmarie. zinc absorption from composite meals. *Naeringsforskning* (1980) 24(3): 110-18.
- HHE** Sandstroem, Brittmarie, Almgren, Annette, Kivistoe, Barbro, and Cederblad, Aake. effect of protein level and protein source on zinc absorption in humans. *J. Nutr.* (1989) 119(1): 48-53.
- HHE** Sandstroem, Brittmarie and Cederblad, Aake. zinc absorption from composite meals. ii. influence of the main protein source. *Am. J. Clin. Nutr.* (1980) 33(8): 1778-83.
- HHE** Sandstrom, B., Cederblad, A., and Lonnerdal, B. 1983. zinc-absorption from human-milk, cows milk, and infant formulas. *American Journal Of Diseases Of Children* 137(8): 726-729.
- HHE** Sandstrom, B., Davidsson, L., Kivisto, B., Hasselblad, C., and Cederblad, A. the effect of vegetables and beet fibre on the absorption of zinc in humans from composite meals. *The British Journal Of Nutrition.* July 1987. v. 58 (1) p. 49-57. charts.
- HHE** Sandstrom, B., Keen, C. L., and Lonnerdal, B. 1983. an experimental-model for studies of zinc bioavailability from milk and infant formulas using extrinsic labeling. *American Journal Of Clinical Nutrition* 38(3): 420-428.
- HHE** Sandstrom, B., Kivisto, B., and Cederblad, A. 1987. absorption of zinc from soy protein meals in humans. *Journal Of Nutrition* 117(2): 321-327.
- FL** Sanduliak, L. I. and Myslitskii, V. F. 1974. [effect of the destruction and stimulation of the ventromedial and arcuate nuclei of the hypothalamus on the histophysiology of the pancreatic islet apparatus]. <original> vliianie razrusheniia i razdrazheniia ventromedial'nykh i arkoobraznykh iader gipotalamusa na gistofiziologiiu insuliarnogo apparata podzheludochnoi zhelezy. *Arkhir Anatomi, Gistologii i Embriologii* 67(9): 76-8.
- Nut def** Sanecki, R. K. and Corbin, J. E. extracutaneous histologic changes accompanying zinc deficiency in pups. *American Journal Of Veterinary Research.* Oct 1985. v. 46 (10) p. 2120-2123. ill.
- Nut def** Sanecki, R. K., Corbin, J. E., and Forbes, R. M. 1982. tissue changes in dogs fed a zinc-deficient ration. *American Journal of Veterinary Research* 43(9): 1642-6.
- Abstract** Sanford, P. E. and Reddy, K. S. 1977. zinc methionine supplementation for poultry. *Poultry Science.* 56 (5): 1754
- BioX** Sankari, S. and Pekkanen, T. 1982. the effect of endotoxin on the liver lipid peroxide level and on the liver and plasma zinc concentrations in rats as related to time after administration. *Acta Veterinaria Scandinavica.* 23 (1): 24-29.
- No Oral** Sankoh, F. A. R. and Boila, R. J. 1987. injectable copper and zinc for grazing yearling steers. *Canadian Journal of Animal Science* 67(4): 1033-1041.
- FL** Sano, H., Hirakawa, I., Sueyoshi, A., Fujita, T., and Shiga, A. 1998. effect of dietary zinc supplementation on blood glucose metabolism, insulin responsiveness to glucose and tissue responsiveness to insulin in sheep. <original> der einfluss einer zink-supplementation auf den glucosestoffwechsel im blut, den insulinrespons fuer glucose und den geweberespons fuer insulin

beim schaf. *Journal of Animal Physiology and Animal Nutrition*. V. 80(1) P. 10-17

- Phys** Sans, Jorge, Aguilera, Ana Maria, Faundez, Paola, Troncoso, Pilar, Fernandez, Virginia, and Videla, Luis A. influence of copper-(ii) on colloidal carbon-induced kupffer cell-dependent oxygen uptake in rat liver: relation to hepatotoxicity. *Free Radical Res.* (1999) 30(6): 489-498.
- Nut def** Sanstead, Harold H., Gillespie, David D., and Brady, Robert N. zinc deficiency. effect on brain of the suckling rat. *Pediat. Res.* (1972) 6(2): 119-25.
- Diss** Santana Covarrubias, D. A. 1979. [effect of supplementation with methionine and zinc in diet of with high content of cassava flour in feeding poultry, hogs and rabbits]. <original> efecto de la suplementacion de metionina y zinc en dietas con alto contenido de harina de yuca en la alimentacion de aves, cerdos y conejos. 77 P.
- Unrel** Santini, A. and Ivanovic, V. 1996. the quantification of tertiary dentine formation in response to materials commonly placed in deep cavities in general practice in the uk. *Primary Dental Care* 3(1): 14-22.
- FL** Santoprete, G. Pisa Univ. Italy Cattedra di Merceologia and Fini, M. A. Bologna Univ. Italy Istituto di Zooculture. 1984. variation of the zinc content in the eggs of laying hens subjected to induced moult. <original> variazioni del contenuto di zinco nelle uova di galline sottoposte a muta forzata. *Rivista Di Avicoltura*. V. 53(3) P. 45-47
- No COC** Santos, M. W. dos, Campos, E. J., and Ferreira, M. O. O. 1978. genetics x nutrition interaction. 4. effect of calcium content of the diet on contents of alkaline phosphatase, calcium, phosphorus, magnesium and zinc in blood of commercial laying hens. *Arquivos Da Escola De Veterinaria Da Universidade Federal De Minas Gerais* 30(1): 75-80.
- FL** Sara, A., Salajan, G., Mierlita, D., and Odagiu Antonio. 1995. biochemical researches upon some microelements from rams testicular parenchyme which received in diet zinc, copper and manganese supplements. *Buletinul Universitatii De Stiinte Agricole Cluj-Napoca Seria Zootehnie Si Medicina Veterinara* 49(0): 103-106.
- Nut def** Saraswat, R. C. and Arora, S. P. 1972. effect of dietary zinc on the vitamin a level and alkaline phosphatase activity in blood sera of lambs. *Indian Journal of Animal Sciences* 42(5): 358-362.
- Nut def** Saraswat, R. C. and Arora, S. P. 1972. zinc deficiency syndromes in lambs. *Indian Veterinary Journal* 49(7): 701-704.
- FL** Sarica, M., Ozturk, E., and Karacay, N. 1996. effects of different forced molting methods on egg production and egg quality traits. *Turk Veterinerlik Ve Hayvancilik Dergisi* 20(2): 143-150.
- Surv** Sarmah, B. C(A), Kalita, D. J(A), and Bhattacharyya, B. N(A). 1999. certain mineral profile and haemoglobin concentration in local nondescript and crossbred (n x j) cattle. *Indian Veterinary Journal* 76(4): 291-293.
- FL** Sarrat, R. 1970. [histochemical aspects of the cornu ammonis under experimental conditions]. <original> histochemische aspekte des ammonshorns unter experimentellen bedingungen. *Verhandlungen Der Anatomischen Gesellschaft* 64: 235-8.
- FL** Sarrat, R. 1980. [morphological and functional relations between the pancreatic islets and the allocortex]. <original> relaciones morfofuncionales entre islotes pancreaticos y allocortex. *Anatomia, Histologia, Embryologia* 9(1): 52-64.

- In Vit** Sarria, B., Cortijo, J., Marti-Cabrera, M., Morcillo, E., and Esplugues, J. antagonism of calcium by zinc in guinea pig isolated tenia ceci and trachealis muscle. *Br. J. Pharmacol.* (1989) 97(1): 19-26 .
- Acu** Sas, B. and Bremner, Ian. effect of acute stress on the absorption and distribution of zinc and on zinc-metallothionein production in the liver of the chick. *J. Inorg. Biochem.* (1979) 11(1): 67-76.
- Nut def** Sas, B., Keszler, P., and Boros, I. effect of zinc deficiency on carbonic anhydrase activity, zinc and copper content of some organs in rats. *Acta Vet. Acad. Sci. Hung.* (1976) 26(3): 357-62.
- Nut def** Sas, B. and Pethes, G. 1981. influence of zinc deficiency on the stability of subcellular membranes and on the 65zn incorporation into metallothionein. *Acta Veterinaria Academiae Scientiarum Hungaricae* 29(4): 441-50.
- Nut def** Sas, Barnabas and Pethes, G. influence of zinc deficiency on the stability of subcellular membranes and on the zinc-65 incorporation into metallothionein. *Acta Vet. Acad. Sci. Hung.* (1981) 29(4): 441-50.
- Unrel** Sasahara, H., Cheuk, S. L., Wink, C. S., Hashimoto, K., Rossowska, M. J., and Nakamoto, T. 1994. alteration of femoral structure in later life by chronically feeding caffeine during rapid growing period in newborn female rats. *Toxicology Letters* 73(1): 55-64.
- Drug** Sasahara, H., Yamano, H., and Nakamoto, T. effects of maternal caffeine with zinc intake during gestation and lactation on bone development in newborn rats. *Arch. Oral Biol.* (1990) 35(6): 425-30.
- Abstract** Sasahara, H., Yamano, H., and Nakamoto, T. interaction between zinc and caffeine on bone development in newborn rats. *18TH ANNUAL SESSION OF THE AMERICAN ASSOCIATION FOR DENTAL RESEARCH, SAN FRANCISCO, CALIFORNIA, USA, MARCH 15-19, 1989. J DENT RES.* 68 (Spec. Issue). 1989. 287.
- Phys** Sasaki Hiroshi(A), Nishizaki Yuriko, Hui Chi-Chung, Nakafuku Masato, and Kondoh Hisato. 1999. regulation of gli2 and gli3 activities by an amino-terminal repression domain: implication of gli2 and gli3 as primary mediators of shh signaling. *Development (Cambridge)* 126(17): 3915-3924.
- No Org** Sasaki, T., Larsson, H., Kreuger, J., Salmivirta, M., Claesson Welsh, L., Lindahl, U., Hohenester, E., and Timpl, R. 1999. structural basis and potential role of heparin/heparan sulfate binding to the angiogenesis inhibitor endostatin. *Vol. 18, No. 22, Pp. 6240-6248 Embo Journal*
- Abstract** Sasser, L. B., Hall, G. G., and Payne, J. L. the relationship between hepatic zinc and metallo thionein in the new born pig. *73RD ANNUAL MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE, RALEIGH, N.C., USA, JULY 26-29, 1982. J ANIM SCI.* 53 (Suppl. 1). 1981 (Recd. 1982). 262.
- QAC** Sasser, L. B., Wade, L. Jr., and Bell, M. C. 1974. effect of radiation on metabolism of selected minerals in cattle. *Journal of Animal Science* 38(1): 178-185.
- Abstract** SATO, F., WATANABE, T., and ENDO, A. cytogenetic effects of zinc deficiency on oogenesis and spermatogenesis. *TERATOLOGY* 26:13A;1982
- Nut def** Sato, F., Watanabe, T., Hoshi, E., and Endo, A. 1985. teratogenic effect of maternal zinc deficiency and its co-teratogenic effect with cadmium. *Teratology* 31(1): 13-8.

Nut def	Sato, Fumihiko, Watanabe, Toshiaki, Hoshi, Eishin, and Endo, Akira. teratogenic effect of maternal zinc deficiency and its co-teratogenic effect with cadmium. <i>Teratology</i> (1985) 31(1): 13-18.
Meth	Sato Hiroki(A), Akama Kuniko(A), Kojima Shuichi, Miura Kin-Ichiro, Sekine Atsushi(A), and Nakano Minoru(A). 1999. expression of a zinc-binding domain of boar spermatidal transition protein 2 in escherichia coli. <i>Protein Expression and Purification</i> 16(3): 454-462.
Fate	Sato, Itaru, Matsusaka, Naonori, Tsuda, Shuji, Suzuki, Tadahiko, and Kobayashi, Haruo. effect of dietary zinc content on 65zn metabolism in mice. <i>J. Vet. Med. Sci.</i> (1997) 59(11): 1017-1021.
Mix	Sato, Katsumasa, Sakaguchi, Sanae, Sakaguchi, Takehiro, Watanabe, Takashi, and Matsui, Seiji. 1985. effects of zinc on accumulation and toxicity of cadmium in mice. <i>Nippon Koshu Eisei Zasshi</i> 32(1): 8-16 .
Nut def	Sato, M. and Nagai, Y. 1989. effect of zinc deficiency on the accumulation of metallothionein and cadmium in the rat liver and kidney. <i>Archives of Environmental Contamination and Toxicology</i> 18(4): 587-93.
Phys	Sato, M. and Sasaki, M. 1991. enhanced lipid peroxidation is not necessary for induction of metallothionein-i by oxidative stress. <i>Chemico-Biological Interactions</i> 78(2): 143-54.
Nut def	Sato, Masao and Nagai, Yasushi. effect of zinc deficiency on the accumulation of metallothionein and cadmium in the rat liver and kidney. <i>Arch. Environ. Contam. Toxicol.</i> (1989) 18(4): 587-93.
No Oral	Sato, Masao, Yamaki, Junko, Oguro, Takiko, Yoshida, Takemi, Nomura, Naruo, and Nakajima, Katsuyuki. metallothionein synthesis induced by interferon .alpha./beta. in mice of various zinc status. <i>Tohoku J. Exp. Med.</i> (1996) 178(3): 241-250.
Alt	Sato, N. and Henkin, R. I. pituitary-gonadal regulation of copper and zinc metabolism in the female rat. <i>Amer. J. Physiol.</i> (1973) 225(2): 508-12 .
No Oral	SATO, S., OKABE, M., KURASAKI, M., and KOJIMA, Y. 1996. metallothionein in the ovaries of laying hens exposed to cadmium. <i>LIFE SCIENCES</i> 58(18): 1561-1567.
Fate	Sato, S. M., Frazier, J. M., and Goldberg, A. M. 1984. the distribution and binding of zinc in the hippocampus. <i>Journal of Neuroscience</i> 4(6): 1662-70.
Fate	Sato, S. M., Frazier, J. M., and Goldberg, A. M. 1984. a kinetic study of the in vivo incorporation of 65zn into the rat hippocampus. <i>Journal of Neuroscience</i> 4(6): 1671-5.
In Vit	Sato, Sheryl M., Frazier, John M., and Goldberg, Alan M. a kinetic study of the in vivo incorporation of zinc-65 into the rat hippocampus. <i>J. Neurosci.</i> (1984) 4(6): 1671-5 .
No COC	Sato, Sheryl M., Frazier, John M., and Goldberg, Alan M. perturbation of a hippocampal zinc-binding pool after postnatal lead exposure in rats. <i>Exp. Neurol.</i> (1984) 85(3): 620-30.
Bio Acc	Sato, T. 1985. a study of the developmental changes in trace elements and minerals in rat and mouse milk by thermal neutron activation analysis. <i>Journal of Radioanalytical and Nuclear Chemistry</i> 92(2): 293-306.
No Oral	Sato, Y., Shiraishi, S., Oshida, Y., Ishiguro, T., and Sakamoto, N. 1989 . experimental atherosclerosis-like lesions induced by hyperinsulinism in wistar rats. <i>Diabetes</i> 38(1): 91-6.

- Drug** Satoh, M., Takeuchi, H., Munakata, K., and Yoshida, O. 1998. [therapeutic effect of cefluprenam on polymicrobial urinary tract infection associated with enterococcus faecalis, using the infectious urolithiasis model in rats]. *Kansenshogaku Zasshi* 72(4): 371-8.
- No Oral** Satoh, Masahiko, Aoki, Yasunobu, and Tohyama, Chiharu. protective role of metallothionein in renal toxicity of cisplatinum. *Cancer Chemother. Pharmacol.* (1997) 40(4): 358-362
- Mix** Satoh, Masahiko, Naganuma, Akira, and Imura, Nobumasa. effect of preinduction of metallothionein on paraquat toxicity in mice. *Arch. Toxicol.* (1992) 66(2): 145-8 .
- Drug** Satoh, Masahiko, Naganuma, Akira, and Imura, Nobumasa. involvement of cardiac metallothionein in prevention of adriamycin induced lipid peroxidation in the heart. *Toxicology* (1988) 53(2-3): 231-7.
- Drug** Satoh, Masahiko, Tsuchiya, Toshiyuki, Kumada, Yuji, Naganuma, Akira, and Imura, Nobumasa. protection against lethal toxicity of various anticancer drugs by preinduction of metallothionein synthesis in mice : brief report. *J. Trace Elem. Exp. Med.* (1993) 6(1): 41-4
- In Vit** Sauer, G. R., Nie, D., Wu, L. N., and Wuthier, R. E. 1998. induction and characterization of metallothionein in chicken epiphyseal growth plate cartilage chondrocytes. *Journal of Cellular Biochemistry* 68(1): 110-20.
- In Vit** Sauer, G. R., Wu, L. N., Iijima, M., and Wuthier, R. E. 1997. the influence of trace elements on calcium phosphate formation by matrix vesicles. *Journal of Inorganic Biochemistry* 65(1): 57-65.
- In Vit** Sauer, Glenn R., Adkisson, H. D., Genge, B. R., and Wuthier, R. E. regulatory effect of endogenous zinc and inhibitory action of toxic metal ions in calcium accumulation by matrix vesicles in vitro. *Bone Miner.* (1989) 7(3): 233-44.
- Unrel** Sauveur, B. 1984. dietary factors as causes of leg abnormalities in poultry-a review. *World's Poultry Science Journal* 40(3): 195-206.
- An Prod** Sauveur, B. 1981. effect of dietary distillers feeds on albumen quality of brown shelled eggs. *Qual. Eggs Proc. Eur. Symp., 1st* : 186-93. Editor(s): Beuving, G.; Scheele, C. W.; Simons, P. C. M. Publisher: Spelderholt Inst. Poult. Res., Beekbergen, Neth. CODEN: 46ICA6.
- Abstract** Savage, D. D. hippocampal mossy fiber zinc is diminished in the genetically epilepsy-prone rat. *17TH ANNUAL MEETING OF THE SOCIETY FOR NEUROSCIENCE, NEW ORLEANS, LOUISIANA, USA, NOVEMBER 16-21, 1987. SOC NEUROSCI ABSTR.* 13 (2). 1987. 943.
- Drug** Savage, D. D., Lopez, S. R., and Paxton, L. L. ethanol liquid diet feeding schedule affects the magnitude of prenatal ethanol exposure-induced reductions in hippocampal mossy fiber zinc in rats. *Alcohol Clin Exp Res* 1994 Apr;18(2):468
- In Vit** Savage, D. D., Montano, C. Y., and Kasarskis, E. J. 1989. quantitative histofluorescence of hippocampal mossy fiber zinc. *Brain Research* 496(1-2): 257-67.
- No COC** Savage, D. D., Montano, C. Y., Paxton, L. L., and Kasarskis, E. J. 1989. prenatal ethanol exposure decreases hippocampal mossy fiber zinc in 45-day-old rats. *Alcoholism, Clinical and Experimental Research* 13(4): 588-93.
- Alt** Savage, D. D., Otero, M. A., Montano, C. Y., Razani-Boroujerdi, S., Paxton, L. L., and Kasarskis, E. J. 1992. perinatal hypothyroidism decreases hippocampal mossy fiber zinc density in rats. *Neuroendocrinology* 55(1): 20-7.

- In Vit** Savage, Daniel D., Montano, Christine Y., and Kasarskis, Edward J. quantitative histofluorescence of hippocampal mossy fiber zinc. *Brain Res.* (1989) 496(1-2): 257-67 CODEN: BRREAP; ISSN: 0006-8993.
- Unrel** Savage, Daniel D., Montano, Christine Y., Paxton, Linda L., and Kasarskis, Edward J. prenatal ethanol exposure decreases hippocampal mossy fiber zinc in 45-day-old rats. *Alcohol.: Clin. Exp. Res.* (1989) 13(4): 588-93.
- Rev** Savage, J. E. 1968. trace minerals and avian reproduction. *Fed Proc.* 27(3): 927-31.
- In Vit** Savagner, P., Yamada, K. M., and Thiery, J. P. 1997. the zinc-finger protein slug causes desmosome dissociation, an initial and necessary step for growth factor-induced epithelial-mesenchymal transition. *Journal of Cell Biology* 137(6): 1403-19.
- Unrel** Savagner Pierre(A), Karavanova Irena, Perantoni Alan, Thiery Jean Paul, and Yamada Kenneth M. 1998. slug mrna is expressed by specific mesodermal derivatives during rodent organogenesis. *Developmental Dynamics* 213(2): 182-187.
- An Prod** Savory, C. J., Mann, J. S., and MacLeod, M. G. 1999. incidence of pecking damage in growing bantams in relation to food form, group size, stocking density, dietary tryptophan concentration and dietary protein source. *British Poultry Science* 40(5): 579-84.
- No Oral** Sawada, M., Takahashi, K., Sawada, S., and Midorikawa, O. 1991. selective killing of paneth cells by intravenous administration of dithizone in rats. *International Journal of Experimental Pathology* 72(4): 407-21.
- No Oral** Sawashita, Jinko, Takeda, Atsushi, and Okada, Shoji. change of zinc distribution in rat brain with increasing age. *Dev. Brain Res.* (1997) 102(2): 295-298.
- Bio Acc** Saxena, D. K. Murthy R. C. Jain V. K. and Chandra S. V. 1986. influence of cadmium on the distribution of cu, zn and fe in different regions of central and peripheral nervous system of rats. *Chemosphere.* 15(3): 373-377.
- In Vit** Saxena Nina C and Macdonald Robert L(A). 1996. properties of putative cerebellar gamma-aminobutyric acid-a receptor isoforms. *Molecular Pharmacology* 49(3): 567-579.
- Nut def** Saxena, R., Bedwal, R. S., and Mathur, R. S. biochemistry of the testes of rats fed on zinc deficient diets. *Trace Elements in Medicine.* 8 (3). 1991. 138-142.
- Nut** Saxena, R., Bedwal, R. S., and Mathur, R. S. 1989. zinc toxicity and male reproduction in rats: a histological and biochemical study. *Trace Elements in Medicine* 6(3): 119-133 .
- Nut def** Saxena Ratna, Bedwal, R. S., and Mathur, R. S. 1993. histopathology of the testes of zinc deficient albino rats. *Trace Elements in Medicine* 10(4): 177-180.
- Org Met** Saxena, Y., Sharma, V., Kumar, D., and Singh, R. 1990. efficacy of different rodenticides against various rodent species. *Indian Journal of Agricultural Research* 24(2): 94-98.
- CP** Sayed, M. A. and Friedberg, K. D. the action of cadmium in drinking water on the content of metallothionein zinc and copper in the liver kidneys and testes of rats. *31ST SPRING MEETING OF THE DEUTSCHE GESELLSCHAFT FUER PHARMAKOLOGIE UND TOXIKOLOGIE (GERMAN SOCIETY FOR PHARMACOLOGY AND TOXICOLOGY), MAINZ, WEST GERMANY, MARCH 13-16, 1990. NAUNYN-SCHMIEDEBERG'S ARCH PHARMACOL.* 341 (Suppl.). 1990. R21.

- CP** Saylor, W. W. and Downer, J. V. alterations in hepatic copper and zinc distribution in the developing chick. *71ST ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC. POULT SCI.* 61 (7). 1982. 1538-1539.
- Mix** Saylor, W. W. and Leach, R. M. Jr. 1980. intracellular distribution of copper and zinc in sheep: effect of age and dietary levels of the metals. *Journal of Nutrition* 110(3): 448-59.
- Fate** Saylor, W. W., Morrow, F. D., and Leach, R. M. Jr. 1980. copper- and zinc-binding proteins in sheep liver and intestine: effects of dietary levels of the metals. *Journal of Nutrition* 110(3): 460-468.
- CP** Saylor, W. W., Morrow, F. D., and Leach, R. M. Jr. 1979. copper- and zinc-binding proteins in sheep liver: effects of dietary levels of the metals. *Federation Proceedings* 38(3, 1): 614.
- Abstract** Saylor, W. W., Morrow, F. D., and Leach, R. M. Jr. copper binding and zinc binding proteins in sheep liver effects of dietary levels of the metals. *Federation Proceedings.* 38 (3 Part 1). 1979 614
- No COC** Saylor, William W. and Downer, Judith V. copper and zinc distribution in the liver and oviduct of estrogen- and testosterone-treated hens (*gallus domesticus*). *Nutr. Res. (N. Y.)* (1986) 6(2): 181-90.
- Mix** Saylor, William W. and Leach, Roland M. Jr. intracellular distribution of copper and zinc in sheep: effect of age and dietary levels of the metals. *J. Nutr.* (1980) 110(3): 448-59.
- Nut** Sbarbati, A., Mocchegiani, E., Marzola, P., Tibaldi, A., Mannucci, R., Nicolato, E., and Osculati, F. effect of dietary supplementation with zinc sulfate on the aging process: a study using high field intensity mri and chemical shift imaging. *Biomed. Pharmacother.* (1998) 52(10): 454-458.
- CP** Sbarouni, E., Iliodromitis, E. K., Bofilis, E., and Kremastinos, Z. S. Kyriakides And T. 1997. short term oestrogen protects ischaemic myocardium in a dose-dependent manner. *European Heart Journal* 18(ABSTR. SUPPL.): 43.
- CP** Scaglia Julio F, Rising Russell, Cole Conrad, Tverskaya Rozalia, and Lifshitz Fima. 1998. exogenous growth hormone (gh) effects during simultaneous suboptimal energy and zinc intake. *Pediatric Research* 43(4 PART 2): 84A.
- Nut def** Scelsi, R., Franciotta, D. M., Camana, C., Savoldi, F., and Allegrini, M. 1989. suppression of experimental allergic encephalomyelitis after dietary zinc deprivation in guinea pigs. *Nutrition Research.* 9(12): 1345-1354.
- FL** Schaaf, A. v. d. 1974. a hereditary condition associated with increased zinc requirements infriesian calves. *Tijdschrift Voor Diergeneeskunde* 99(19): 1017-1020.
- Mix** Schaafsma, G., Dekker, P. R., and De Waard, H. 1988. nutritional aspects of yogurt. 2. bioavailability of essential minerals and trace elements. *Neth. Milk Dairy J.* 42(2): 135-46 .
- Nut** Schaafsma, G., Dekker, P. R., and Waard, H. de. 1988. nutritional aspects of yoghurt. ii. bioavailability of essential minerals and trace elements. *Netherlands Milk and Dairy Journal* 42(2): 135-146.
- Unrel** Schad, G. A., Smith, G., Megyeri, Z., Bhopale, V. M., Niamatali, S., and Maze, R. 1993. stronglyloides stercoralis: an initial autoinfective burst amplifies primary infection. *American Journal of Tropical Medicine and Hygiene* 48(5): 716-725.

- Unrel** Schafer, A. J. 1995. sex determination and its pathology in man. *Advances in Genetics* 33: 275-329.
- IMM** Schafer, R. and Wernig, A. 1998. polyclonal antibodies against ncam reduce paralysis-induced axonal sprouting. *Journal of Neurocytology* 27(8): 615-24.
- FL** Schaffer, E. and Bomhard, D. von. 1973. (studies on an endemic arthrosis in fattening pigs). *Berliner Und Munchener Tierarztliche Wochenschrift* 86(Heft 4): 64-69.
- BioAcc** Schee, W. van der, Assem, G. H. van den, and Berg, R. van der. 1983. breed differences in sheep with respect to the interaction between zinc and the accumulation of copper in the liver. *Veterinary Quarterly* 5(4): 171-174.
- Abstract** Scheibel, M. S., Mehta, T., and Leathers, C. W. the effect of fiber on the absorption of zinc and copper in rats. *64TH ANNUAL MEETING OF THE FED. AM. SOC. EXP. BIOL., ANAHEIM, CALIF., USA, APR. 13-18, 1980. FED PROC.* 39 (3). 1980. Abstract 3344.
- Abstract** Scheideler, S. E(A), Ceylan, N., Novak C(A), Puthongsiriporn U(A), and Sefton, T. 1999. supplemental manganese (mn) and zinc (zn) from inorganic and organic measurements. *Poultry Science* 78(SUPPL. 1): 70-71.
- No COC** Schemmel, R. A., Teague, R. J., and Bray, G. A. 1982. obesity in osborne-mendel and s 5b/pl rats: effects of sucrose solutions, castration, and treatment with estradiol or insulin. *American Journal of Physiology* 243(3): R347-53.
- CP** Schenkel, H., Lantzsch, H. J., and Scheuermann, S. 1982. influence of zinc status on lead metabolism in rats. *Trace Elem. Metab. Man Anim. Proc. Int. Symp., 4th* : Meeting Date 1981, 575-7. Editor(s): Gawthorne, J. M.; Howell, J. McC.; White, C. L. Publisher: Springer, Berlin, Fed. Rep. Ger..
- Yeast** Scherens, B., el Bakkoury, M., Vierendeels, F., Dubois, E., and Messenguy, F. 1993. sequencing and functional analysis of a 32,560 bp segment on the left arm of yeast chromosome ii. identification of 26 open reading frames, including the kip1 and sec17 genes. *Yeast* 9(12): 1355-71.
- FL** Scheuermann, S. E. and Lantzsch, H. J. 1982. relation of different indices of zinc metabolism to initial zinc status. 1. growth, zinc concentration and activity of alkaline phosphatase in serum. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde* 48(4): 224-231.
- FL** Scheuermann, S. E. and Lantzsch, H. J. 1982. [dependence of various parameters of zn metabolism on initial zn status. 1. growth, zn concentrations and alkaline phosphatase activity in serum]. <original> zur abhangigkeit verschiedener parameter des zn-stoffwechsels vom zn-ausgangstatus. 1. mitteilung. wachstum, zn-konzentration und aktivitat der alkalischen phosphatase im serum. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde*;
- FL** Scheuermann, S. E. and Lantzsch, H. J. 1982. effect of initial body zinc content on various parameters of zinc metabolism. 1. growth and zinc concentration and alkaline phosphatase in serum. *Z. Tierphysiol. Tierernaehr. Futtermittelkd.* 48(4): 224-31.
- FL** Scheuermann, S. E. and Lantzsch H-J. influence of the body zinc content on the reaction of various parameters of zinc metabolism. *Zeitschrift Fuer Tierphysiologie Tierernaehrung Und Futtermittelkunde.* 48 (4). 1982. 224-231.
- Unrel** Scheuhammer, A. M. and Dickson, K. M. 1996. patterns of environmental lead exposure in waterfowl in eastern canada. *AMBIO.* 25(1): 14-20.

- Bio Acc** Scheuhammer, A. M. and Templeton, D. M. 1990. metallothionein production: similar responsiveness of avian liver and kidney to chronic cadmium administration. *Toxicology*. 60(1-2): 151-160.
- No Oral** Scheuhammer, A. M. Onosaka S. Rodgers K. and Cherian M. G. 1985. the interactions of zinc and cadmium in the synthesis of hepatic metallothionein in rats. *Toxicology*. 36: 101-108.
- IMM** Schiffer, R. B., Sunderman, F. W. Jr, Baggs, R. B., and Moynihan, J. A. 1991. the effects of exposure to dietary nickel and zinc upon humoral and cellular immunity in sjl mice. *J Neuroimmunol*. 34(2-3): 229-39.
- Phys** Schild, L., Ravindran, A., and Moczydlowski, E. zinc induced subconductance events in cardiac sodium channels prolonged by batrachotoxin current-voltage behavior and single-channel kinetics. *Journal of General Physiology*. 97 (1). 1991. 117-142.
- Phys** Schild Laurent and Moczydlowski Edward(A). 1994. permeation of na⁺ through open and zn-2+-occupied conductance states of cardiac sodium channels modified by batrachotoxin: exploring ion-ion interactions in a multi-ion channel. *Biophysical Journal* 66(3 PART 1): 654-666.
- Drug** Schildknecht, E. G., Trainor, C., Givens, S. V., De Young, W. W., and Mitrovic, M. 1980. compatibility and anticoccidial activity of lasalocid in combination with roxarsone and antibiotics against eimeria mixed infection in chicks. *Poultry Science* 59(2): 268-73.
- No COC** Schitoskey, F. Jr. 1975. primary and secondary hazards of three rodenticides to kit fox. *J.Wildl.Manag.* 39(2): 416-418.
- Unrel** Schlegel, W. and Wahner, M. 1979. shortening oestrous cycle blockade during synchronized oestrus and ovulation in gilts. *Monatshefte Fur Veterinarmedizin* 34(15): 571-574.
- No Oral** Schlenker, E. H., Carlson, D., and Herreid, C. F. II. metabolic contribution of carbon di oxide to the group effect. *American Journal of Physiology*. 241 (5). 1981. R264-R266.
- FL** Schley, P. 1977. [the elimination of the sense of smell and its effect on the suckling behavior in young rabbits]. <original> die ausschaltung des geruchsvermögens und sein einfluss auf das saugverhalten von jungkaninchen. *Berliner Und Munchener Tierarztliche Wochenschrift* 90(19): 382-5.
- Diss** Schlicker, Sandra A. 1970. interrelation of high zinc and high calcium in the maternal diet on the mineral composition of brain and liver in the newborn, weanling, and maternal rat. Avail.: Univ. Microfilms. Ann Arbor, Mich., Order No. 71-6354 From: Diss. Abstr. Int. B 1971, 31. 9. 5721. 130 pp.
- No Dose** Schlicker, Sandra A. and Cox, Dennis H. maternal dietary zinc and the development and zinc, iron, and copper content of the rat fetus. *J. Nutr.* (1968) 95(2): 287-94.
- No Oral** Schlund, Wolfgang. intra-nasal zinc sulfate irrigation in pigeons: effects on olfactory capabilities and homing. *J. Exp. Biol.* (1992) : 164, 171-87.
- Unrel** Schmeichel, K. L. and Beckerle, M. C. 1998. lim domains of cysteine-rich protein 1 (crp1) are essential for its zyxin-binding function. *Biochemical Journal* 331(Pt 3): 885-92.
- No Oral** Schmid Jutta and Schlund Wolfgang(A). 1993. anosmia in znso-4-treated pigeons: loss of olfactory information during ontogeny and the role of site familiarity in homing experiments. *Journal of Experimental Biology* 185(0): 33-49.

- FL** Schmidmayer, S., Roth, H. P., and Kirchgessner, M. 1999. effect of dietary calcium and zinc deficiency on the activities of calmodulin-regulated enzymes in different rat tissues. *Journal of Animal Physiology and Animal Nutrition* 82(4): 169-177.
- Nut def** Schmidmayer, S., Roth, H.-P., and Kirchgessner, M. influence of an alimentary calcium and zinc deficiency on the activities of calmodulin-regulated enzymes in different tissues of the rat. *J. Anim. Physiol. Anim. Nutr.* (1999) 82(4): 169-177 CODEN: JAPNEF; ISSN: 0931-2439.
- Nut def** Schmidmayer, S., Roth H-P(A), and Kirchgessner, M. 2000. activities of calmodulin-regulated enzymes in zinc-deficient rats. *Trace Elements and Electrolytes*. 17(1): 30-35.
- FL** Schmidt, A., Kolb, E., Hofmann, U., Gruendel, G., Nestler, K., and Schmidt, U. Universitaet Leipzig German D. R. Sektion Tierproduktion und Veterinaermedizin. 1990. studies into hb levels in blood as well as into protein, iron, fe-binding capacity, copper, and zinc in blood plasma of pregnant sows, prior to and after oral administration of iron. <original> untersuchungen ueber den gehalt an hb im blut sowie ueber den an protein, fe, fe-bindungskapazitaet, cu und zn im blutplasma von niedertragenden sauen vor bzw. nach oraler fe-belastung. *Archiv Fuer Experimentelle Veterinaermedizin*. V. 44(3) P. 439-446
- FL** Schmidt, J. G. and Hummelsheim, S. 1986. [effect of decadron phosphate on ophthalmoscopic changes in the rat eye with intravitreal brass wires]. <original> uber den einfluss von decadron-phosphat auf die ophthalmoskopischen veränderungen des rattenauges bei intravitrealen messingdrahten. *Klinische Monatsblätter Fur Augenheilkunde* 188(3): 234-8.
- No Oral** Schmidt, J. G., Nies, C., and Mansfeld-Nies, R. 1987. on the recovery of the electroretinogram after removal of intravitreal zinc particles. *Documenta Ophthalmologica* 65(4): 471-80.
- No Oral** Schmidt, J. G. H. and Hummelsheim, S. the influence of decadron phosphate on ophthalmoscopic changes in rats after intravitreal implantation of brass wires. *Klinische Monatsblätter Fur Augenheilkunde*. 188 (3). 1986. 234-238.
- No Oral** Schmidt, Joachim G. H., Nies, Christoph, and Mansfeld-Nies, Regina. on the recovery of the electroretinogram after removal of intravitreal zinc particles. *Doc. Ophthalmol.* (1987) 65(4): 471-80 .
- Nut** Schmidt, M. 1977. effect of excessive amounts of protein on digestion and intermediary metabolism in dogs. 136pp.
- In Vit** Schmidt, R. zinc metabolism in islets of langerhans. *Verh. Anat. Ges.* (1986) 80th(Teil 2): 505-6 CODEN: VHAGAS; ISSN: 0066-1562.
- FL** Schmidt, R., Muller, H., Glass, P., Schneider, S., and Unger, E. 1990. [effect of alloxans on pancreatic b-cells with special regard to the alloxan-metal-complex theory. i. effects of alloxan, alloxan-zinc chelates, dilauric acid and colchicine on blood sugar and rate of mitosis of b-cell langerhans islets]. *Acta Histochemica* 88(1): 29-46.
- Alt** Schmidt, R. and Schultka, R. 1975. [the significance of heavy metals in normal and diabetic islands of langerhans. current discoveries of light and electron microscopic distribution of metals in embryonal and postnatal developmental stages of the island organ in white rats]. <original> die bedeutung von schwermetallen in der normalen und diabetischen langerhansschen insel. neue erkenntnisse der licht- und elektronenmikroskopischen metallverteilung in embryonalen und postnatalen entwicklungsstadien des inselorgans weisser ratten. *Acta Histochemica* 15: 161-76.
- Alt** Schmidt, R., Schultka, R., Wiemann, B., and Straub, E. the behavior of the zinc containing vacuoles in normal and alloxan diabetic islets of langerhans of white rats. *Acta Histochemica*.

50 (2). 1974 200-211.

- FL** Schmidt, R., Schultka, R., Wiemann, B., and Straub, E. 1974. [the behaviour of the zinc-content vacuols in normal and alloxandabetic islets of langerhans of white rats (author's transl)]. <original> das verhalten zinkhaltiger vakuolen in normalen und alloxan-diabetischen langerhansschen inseln weisser ratten. *Acta Histochemica* 50(2): 200-11.
- In Vit** Schmidt, Rainer, Cobet, Ulrich, Meinel, Peter, and Schultka, Ruediger. directed metal determination in pre- and post-natal stages of development of the islets of langerhans by combined histochemical metal demonstration with electron-x-ray microanalysis. *Acta Histochem.* (1976) 56(1): 107-14 .
- Alt** Schmidt, Rainer, Schultka, Ruediger, Wiemann, Bernd, and Straub, Erhardt. behavior of zinc-containing vacuoles in normal and alloxan diabetic islets of langerhans in white rats. *Acta Histochem.* (1974) 50(2): 200-11.
- Phys** Schmidt, T., Karsunky, H., Gau, E., Zevnik, B., Elsasser, H. P., and Moroy, T. 1998. zinc finger protein gfi-1 has low oncogenic potential but cooperates strongly with pim and myc genes in t-cell lymphomagenesis. *Oncogene* 17(20): 2661-7.
- No COC** Schmidt, T., Karsunky, H., Roedel, B., Zevnik, B., Elsaesser, H. P., and Moeroey, T. 1998. evidence implicating gfi-1 and pim-1 in pre-t- cell differentiation steps associated with beta - selection. *Vol. 17, No. 18, Pp. 5349-5359 Embo J.*
- FL** Schmidt, V. and Mintzlaff, H. J. 1973. residues in meat: antibiotics and mycotoxins. *Fleischwirtschaft* 53(9): 1211-1212.
- CP** Schneeman, B. O. and Berger, J. 1986. intestinal zinc and carboxypeptidase activity (cp) in rats fed test meals containing various dietary proteins. *Federation Proceedings* 45: 818.
- Abstract** Schneeman, B. O. and Berger, J. intestinal zinc and carboxypeptidase activity in rats fed test meals containing various dietary proteins. *70TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 13-18, 1986. FED PROC. 45 (4). 1986. 818.*
- Nut def** Schneeman, B. O., Lacy, D., Ney, D., Lefevre, M. L., Keen, C. L., Lonnerdal, B., and Hurley, L. S. similar effects of zinc deficiency and restricted feeding of plasma lipid and lipoproteins in rats. *J NUTR. Journal of Nutrition.* 116 (10). 1986. 1889-1895.
- Nut def** Schneeman, B. O., Lacy, D., Ney, D., Lefevre, M. L., Keen, C. L., Lonnerdal, B., and Hurley, L. S. 1986. similar effects of zinc deficiency and restricted feeding on plasma lipids and lipoproteins in rats. *The Journal Of Nutrition.* 116(10): 1889-1895.
- Alt** Schneeman, B. O. JONUA, Lonnerdal, B., Keen, C. L., and Hurley, L. S. 1983. zinc and copper in rat bile and pancreatic fluid: effects of surgery (trace elements). *The Journal Of Nutrition.* 113 (6): 1165-1168.
- Nut def** Schneeman, Barbara O., Lacy, Dee, Ney, Denise, Lefevre, Michael L., Keen, Carl L., Lonnerdal, Bo, and Hurley, Lucille S. similar effects of zinc deficiency and restricted feeding on plasma lipids and lipoproteins in rats . *J. Nutr.* (1986) 116(10): 1889-95.
- FL** Schneider, D., Bronsch, K., and Richter, L. 1973. effectiveness of quindoxin in pigs. *Zeitschrift Fur Tierphysiologie Tierernahrung Und Futtermittelkunde* 32(4): 177-185.
- FL** Schneider, D., Bronsch, K., and Richter, L. olaquinox a new growth promoting feed additive

part 2 the effect on the performance of growing swine. *Zeitschrift Fuer Tierphysiologie Tierernaehrung Und Futtermittelkunde*. 36 (5). 1976 241-249.

- FL** Schneider, D., Bronsch, K., and Richter, L. 241. olaquinox, a new growth stimulant in animal nutrition. 2.effectiveness in fattening pigs. *Zeitschrift Fur Tierphysiologie, Tierernaehrung Und Futtermittelkunde*
- Alt** Schneider, H. J. and Anke, M. 1969. [mineral content of the compensatorily hypertrophied kidney in the growing animal]. <original> der mineralstoffgehalt kompensatorisch hypertrophierter nieren beim wachsenden tier. *Urologia Internationalis* 24(4): 300-9.
- No Oral** Schneider, M. Resnick M. I. and Wellmann K. F. 1973. increased bone formation in rabbits following intravenous and intra-osseous injection of zinc beryllium silicate. *Clin Orthop Relat Res*. 92: 251-259.
- No COC** Schneider-Maunoury, S., Seitanidou, T., Charnay, P., and Lumsden, A. 1997. segmental and neuronal architecture of the hindbrain of krox-20 mouse mutants. *Development* 124(6): 1215-26.
- No COC** Schneider-Maunoury, S., Topilko, P., Seitanidou, T., Levi, G., Cohen-Tannoudji, M., Pournin, S., Babinet, C., and Charnay, P. 1993. disruption of krox-20 results in alteration of rhombomeres 3 and 5 in the developing hindbrain. *Cell (Cambridge)* 75(6): 1199-1214.
- FL** Schneider, U. A. and Kirchgessner, M. 1978. effect of different intakes of zinc and fe during pregnancy on the and iron status of the foetus and on weight gains of young rats. | ti-waehrend der graviditat auf den zn- bzw. fe-status der rattenfoeten und auf die gewichtsentwicklung der jungtiere. *Zentralblatt Fur Veterinarmedizin, A*. 25(5): 403-410.
- FL** Schneider, U. A. and Kirchgessner, M. effect of varying intake of zinc and iron during pregnancy on zinc and iron status of fat fetuses and on weight gain in young animals. *Zentralblatt Fuer Veterinaermedizin Reihe A*. 25 (5). 1978. 403-410.
- FL** Schneider, U. A. and Kirchgessner, M. 1978. [effect of varying intake of zn and fe during pregnancy on the zn and fe status of rat fetuses and on weight gain in young animals]. <original> zum einfluss unterschiedlicher zn- und fe-versorgung waehrend der graviditat auf den zn- bzw. fe-status der rattenfoeten und auf die gewichtsentwicklung der jungtiere. *Zentralblatt Fur Veterinarmedizin. Reihe A* 25(5): 403-10 .
- FL** Schneider, Ursula A. and Kirchgessner, M. 1978. effect of varying intake of zinc and iron during pregnancy on zinc and iron status of rat fetuses and on weight gain in young animals. *Zentralbl. Veterinaermed. Reihe A* 25(5): 403-10.
- Rev** Schneider, Ursula A. and Kirchgessner, M. zinc retention changes in organisms during pregnancy. *Nutr. Metab. (1979)* 23(4): 241-9 .
- FL** Schnurrbusch, U., Elze, K., and Erices, J. histological findings in the uterus of gilts following synchronized ovulation. *Archiv Fur Experimentelle Veterinarmedizin* | SN- 0003-9055 | PY- 1977 31(6): 905-912.
- Abstract** Schoenbaum, D. C., Beede, D. K., Risco, C. A., Donovan, G. A., and Thatcher, W. W. 1994. effects of prepartum dietary cation-anion difference, and prepartum and postpartum zinc supplementation on peripartum health, and postpartum reproductive and lactational performance. *Journal of Dairy Science* 77(SUPPL. 1): 95.
- FL** Schoene, F., Luedke, H., Gruhn, K., and Hennig, A. the influence of iodine copper and zinc

supplements to rations with a high quota of rape seed meal on growth and the function of the thyroid gland of fattening pigs 2. the influence of iodine supplement on the digestibility of nutrients as well as on protein and energy retention. . *Archiv Fuer Tierernaehrung*. 36 (4-5). 1986. 361-369.

- FL** Schoene, F., Luedke, H., Jahreis, G., Seffner, W., and Hennig, A. the influence of iodine copper and zinc supplements to rations with a high quota of rape seed meal on growth and the function of the thyroid gland of fattening pigs 3. the influence on the weight of and the histomorphometric findings in the thyroid gland as well as triiodothyroxine and thyroxine concentration in the serum. *Archiv Fuer Tierernaehrung*. 36 (4-5). 1986. 371-380.
- No COC** Schoenig, G. P. and Anderson, R. L. 1985. the effects of high dietary levels of sodium saccharin on mineral and water balance and related parameters in rats. *Food and Chemical Toxicology* 23(4-5): 465-74.
- HHE** Scholmerich, J., Freudemann, A., Kottgen, E., Wietholtz, H., Steiert, B., Lohle, E., Haussinger, D., and Gerok, W. 1987. bioavailability of zinc from zinc-histidine complexes .1. comparison with zinc-sulfate in healthy-men. *American Journal Of Clinical Nutrition* 45(6): 1480-1486.
- Nut def** Scholmerich, J., Lohle, E., Kottgen, E., and Gerok, W. 1983. zinc and vitamin-a-deficiency in liver-cirrhosis. *Hepato-Gastroenterology* 30(4): 119-125.
- FL** Scholz, H., Kolb, E., Hofmann, U., Dittrich, H., and Nestler, K. studies into levels of total iron non-heme iron copper and zinc in various organs of piglets before weaning with differentiated iron supply. *Monatshefte Fuer Veterinaermedizin*. 43 (8). 1988. 270-272.
- Drug** Schone, F., Geinitz, D., Grun, M., Hennig, A., <Editors> Flachowsky, G., Schone, F., and Henning, A. 1991. influence of glucosinolate and iodine supply on thyroid hormone, vitamin a and trace element status of pigs fed on rapeseed oilmeal. 36-41.
- No COC** Schone, F., Ludke, H., Gruhn, K., and Hennig, A. 1986. effect of iodine, copper and zinc supplements to diets with a high proportion of rapeseed meal on growth and function of the thyroid gland in fattening pigs. 2. effect of supplementary iodine on digestibility of nutrients and on protein and energy retention. *Archives of Animal Nutrition* 36(4/5): 361-369.
- Nut def** Schone, F., Ludke, H., Hennig, A., and Jahreis, G. 1988. copper and iodine in pig diets with high glucosinolate rapeseed meal. 2. influence of iodine supplements for rations with rapeseed meal untreated or treated with copper ions on performance and thyroid hormone status of growing pigs. *Animal Feed Science and Technology* 22(1-2): 45-59.
- Mix** Schone, F., Ludke, H., Jahreis, G., Seffner, W., and Hennig, A. 1986. effect of iodine, copper and zinc supplements to diets with a high proportion of rapeseed meal on growth and function of the thyroid gland in fattening pigs. 3. effect on thyroid mass and histomorphometric findings and on triiodothyronine and thyroxine in serum. *Archives of Animal Nutrition* 36(4/5): 371-380.
- Org Met** Schoof, H. F. 1942. zinc phosphide as a rodenticide. *Pest Control*; 38(5): 38
- Prim** Schoonees, R., De Klerk J N, Mirand, E. A., and Murphy, G. P. the effect of bovine growth hormone on zinc-65 metabolism and prostatic blood flow of intact testosterone treated and castrated adult male chacma baboons *Investigative Urology*. 8 (1). 1970 103-115.
- No Oral** Schoots, A. F. M., Crusio, W. E., and Van Abeelen, J. H. F. zinc-induced peripheral anosmia and exploratory behavior in two inbred mouse strains. *Physiol. Behav.* (1978) 21(5): 779-84
- Alt** Schouten, J. A., Beynen, A. C., De Rooy, P. D., Hoitsma, H. F., and Bosma, A. 1986. long-term

effects of partial ileal bypass on the health status of rabbits. *Laboratory Animals* 20(2): 148-54.

- Nut def** Schrager, Thomas F., Busby, William F. Jr., Goldman, Mark E., and Newberne, Paul M. enhancement of methylbenzyl nitrosamine-induced esophageal carcinogenesis in zinc-deficient rats : effects on incorporation of [3h]thymidine into dna of esophageal epithelium and liver. *Carcinogenesis (London) (1986)* 7(7): 1121-6
- Food** Schrijver, R. de. and Conrad, S. 1992. availability of calcium, magnesium, phosphorus, iron, and zinc in rats fed oat bran containing diets. *Journal Of Agricultural And Food Chemistry.* 40(7): 1166-1171.
- No COC** Schroeder, H. A. 1970. *Metallic Micronutrients and Intermediary Metabolism.* <NOTE> *Progress Rept. No. 3 (Final)*
- Bio Acc** Schroeder, H. A. and Nason, A. P. 1976. interactions of trace metals in mouse and rat tissues; zinc, chromium, copper, and manganese with 13 other elements. *J Nutr.* 106(2): 198-203.
- No Oral** Schryver, H. F., Hintz, H. F., and Lowe, J. E. 1980. absorption, excretion and tissue distribution of stable zinc and 65zinc in ponies. *Journal of Animal Science* 51(4): 896-902.
- FL** Schubert R, Hennig A, and Richter G. 1981. untersuchungen zum ergotropen effekt des kormogrisins und zinkbazitrazins bei der mast der moschusente (*cairina moschata*). *MONATSHEFTE FUER VETERINAERMEDIZIN* 36. 119(13): 505-507, illustr.
- FL** Schuelein, A., Kirchgessner, M., and Roth, H. P. effect of force-feeding on growth , zinc status, and blood serum insulin and glucagon in zinc-deficient rats. *J. Anim. Physiol. Anim. Nutr.* (1992) 67(3): 157-69.
- Nut def** Schuelein, A., Kirchgessner, M., and Roth, H. P. influence of zinc deficiency on zinc, protein, fat, and energy retention in force-fed rats. *J. Anim. Physiol. Anim. Nutr.* (1992) 68(2): 104-110.
- FL** Schuelein, A., Roth H-P, and Kirchgessner, M. 1992. influence of zinc deficiency on retention of zinc, protein, fat and energy of force-fed rats. *Journal of Animal Physiology and Animal Nutrition* 68(2): 104-110.
- FL** Schulz, V. and Gropp, J. 1973. nutritive effects of antibiotics for rearing quail. *Archiv Fur Geflugelkunde* 37(5): 176-179.
- No COC** Schurz, M., Jeroch, H., Pingel, H., and Fehlhaber, K. 1993. influence of antibiotic growth promoters and polysaccharide-cleavingenzymes on fattening and slaughter performance, meat quality and microbial contamination of the carcass of male broilers. 409-412.
- No COC** Schurz, M., Jeroch, H., Pingel, H., Fehlhaber, K., <Editors> Flachowsky, G., and Schubert, R. 1993. effect of the growth promoter zinc bacitracin (albac 150 g) in broilerfattening. 290-295.
- Phys** Schuschke Dale A(A). 1997. dietary copper in the physiology of the microcirculation. *Journal of Nutrition* 127(12): 2274-2281.
- Gene** Schutz, B. and Niessing, J. 1994. cloning and structure of a chicken zinc finger cdna: restricted expression in developing neural crest cells. *Gene* 148(2): 227-36.
- In Vit** Schwartz, B. R., Trelstad, R. L., Hutson, J. M., Ikawa, H., and Donahoe, P. K. 1984. zinc chelation and mullerian duct regression. *Journal of Experimental Pathology* 1(2): 143-56 .

Drug	Schwartz, R., Topley, M., and Russell, J. B. 1988. effect of tricarballic acid, a nonmetabolizable rumen fermentation product of trans-aconitic acid, on mg, ca and zn utilization of rats. <i>Journal of Nutrition</i> 118(2): 183-8.
Phys	Schwartz Rochelle D(A), Wagner Joseph P, Yu Xiao, and Martin David. 1994. bidirectional modulation of gaba-gated chloride channels by divalent cations: inhibition by ca-2+ and enhancement by mg-2+. <i>Journal of Neurochemistry</i> 62(3): 916-922.
No COC	Schwartz, Ruth, Topley, M., and Russell, James B. effects of tricarballic acid, a nonmetabolizable rumen fermentation product of trans-aconitic acid, on magnesium, calcium, and zinc utilization of rats. <i>J. Nutr.</i> (1988) 118(2): 183-8 .
Nut def	Schwarz, A. and Kirchgessner, M. 1975. (zinc concentration in cattle hair in zinc deficiency). <i>Deutsche Tierärztliche Wochenschrift</i> 82(No.4): 141-143.
Not Avail	Schwarz, E. R. 1975. (studies on the behaviour of 65zn in cockerels and hens after repeated oral administration, with reference to the contamination risk for the consumer). 122pp.
Nut def	Schwarz, F. J. and Kirchgessner, M. 1974. absorption of 65zinc and 64copper in zinc deficiency. <i>International Journal for Vitamin and Nutrition Research</i> 44(2): 258-266.
FL	Schwarz, F. J. and Kirchgessner, M. changes in copper and zinc absorption and excretion after deficient copper supply. <i>Zeitschrift Für Tierphysiologie Tierernährung Und Futtermittelkunde.</i> 41 (6). 1979. 335-343.
FL	Schwarz, F. J. and Kirchgessner, M. 335. changes in the absorption and excretion of copper and zinc with an inadequate supply of copper. <i>Zeitschrift Für Tierphysiologie, Tierernährung Und Futtermittelkunde</i>
FL	Schwarz, F. J. and Kirchgessner, M. 1976. distribution and excretion of zinc given by vein to rats with zn supplies. <i>Zentralblatt Für Veterinärmedizin, A</i> 23(10): 836-848.
Nut def	Schwarz, F. J. and Kirchgessner, M. 1974. interactions in the intestinal absorption of 64cu, 65zn and 59fe after cu, zn or fe depletion. <i>International Journal for Vitamin and Nutrition Research</i> 44(1): 116-126.
CP	Schwarz, F. J. and Kirchgessner, M. 1974. intestinal absorption of copper, zinc, and iron after dietary depletion. <i>Trace Elem. Metab. Anim. Proc. Int. Symp., 2nd</i> : Meeting Date 1973, 519-22. Editor(s): Hoekstra, W. G. Publisher: Univ. Park Press, Baltimore, Md. CODEN: 29IIAN.
CP	Schwarz, F J and Kirchgessner, M. intestinal absorption of copper, zinc, and iron after dietary depletion. [rats, laboratory animals]. <i>In International Symposium On Trace Element Metabolism In Animals</i> 1973 (pub. 1974) 2d: 519-522.
No Oral	Schwarz, F. J. and Kirchgessner, M. 1976. intestinal zinc absorption after i.v. zinc injection in different amounts and intervals. <i>Z. Tierphysiol. Tierernähr. Futtermittelkd.</i> 37(1): 31-44.
FL	Schwarz, F. J. and Kirchgessner, M. 1968. metabolic dependence of intestinal uptake and transfer of different zinc compounds after deficient and adequate zinc intake. <i>Zeitschrift Für Tierphysiologie Tierernährung Und Futtermittelkunde</i>
FL	Schwarz, F. J. and Kirchgessner, M. partition and endogenous secretion of zinc given intravenously in rats with varying zinc intake. <i>ZENTRALBL VETERINÄRMED REIHE A. Zentralblatt Für Veterinärmedizin Reihe A.</i> 23 (10). 1976 (Recd 1977) 836-848.

- FL** Schwarz, F. J. and Kirchgessner, M. 1976. partition and secretion of intravenously administered zinc in rats with varying zinc intake. *Zentralbl. Veterinaarmed. Reihe A* 23(10): 836-48 CODEN: ZVRAAX.
- No Oral** Schwarz, F. J. and Kirchgessner, M. studies on the homeostatic regulation of the zinc metabolism by zinc infusions. *Research in Experimental Medicine*. 170 (3). 1977 241-252.
- Nut def** Schwarz, F. J. and Kirchgessner, M. studies on the homeostatic regulation of zinc metabolism by zinc infusions. *Res. Exp. Med.* (1977) 170(3): 241-51.
- FL** Schwarz, F. J. and Kirchgessner, M. 1976. zinc absorption after i. v. administration of zinc to rats with various levels of zinc intake. *Zentralbl. Veterinaarmed. Reihe A* 23(10): 849-57.
- FL** Schwarz, F. J. and Kirchgessner, M. zinc absorption after intra venous application of zinc to rats on various levels of zinc intake. *Zentralblatt Fuer Veterinaermedizin Reihe A.* 23 (10). 1976 (Recd 1977) 849-857.
- In Vit** Schwarz, F. J., Kirchgessner, M., and Roth, H. P. 1983. influence of picolinic-acid and citric-acid on intestinal-absorption of zinc invitro and invivo. *Research In Experimental Medicine* 182(1): 39-48.
- FL** Schwarz, G. and Pallauf, J. experimental zinc deficiency in growing rabbits and its influence on the zinc status of blood serum. *J. Anim. Physiol. Anim. Nutr.* (1987) 57(5): 227-36.
- FL** Schwarz, G. and Pallauf, J. influence of dietary zinc deficiency on the activity of various zinc metalloenzymes in growing rabbits. *J. Anim. Physiol. Anim. Nutr.* (1989) 61(2/3): 129-38.
- FL** Schwarz, W. A. and Kirchgessner, M. 1974. (development of a semisynthetic zinc-deficient diet for lactating cows). *Veterinar-Medizinische Nachrichten* (Heft 4): 315-325.
- Nut def** Schwarz, W. A. and Kirchgessner, M. 1975. experimental zinc deficiency in lactating dairy cows. *Veterinary Medical Review* (1/2): 19-41.
- Nut def** Schwarz, W. A. and Kirchgessner, M. 1974. notes on the development of a semi-purified zinc deficiency diet for dairy cows. *Veterinary Medical Review* (No.4): 323-333.
- FL** Schwarz, W. A. and Kirchgessner, M. studies on zinc status and dynamics in lactating cows experimental design and procedures 12th report on the metabolism of zinc in the animal organism. *Zeitschrift Fuer Tierphysiologie Tierernaehrung Und Futtermittelkunde.* 34 (5). 1975 281-288.
- Nut def** Schwarz, W. A. and Kirchgessner, M. 1975. zinc concentration in hair of cattle in zinc deficiency. *Deutsche Tierarztliche Wochenschrift* 82(4): 141-143.
- FL** Schwarz, W. A. and Kirchgessner, M. 1975. zinc excretion of lactating cows with different zinc intake. *Archiv Fur Tierernahrung* 25(9/10): 597-608.
- FL** Schwarz, W. A. and Kirchgessner, M. 1975. zinc metabolism in animals. 12. zinc status and turnover of zinc in lactating cows. experimental plan and procedures. *Zeitschrift Fur Tierphysiologie Tierernaehrung Und Futtermittelkunde* 34(5): 281-288.
- FL** Schwarz, W. A. and Kirchgessner, M. 1975. zinc metabolism in animals. 13. zinc concentration in serum and blood of lactating cows during experimental zinc deficiency and repletion. *Zeitschrift Fur Tierphysiologie Tierernaehrung Und Futtermittelkunde* 34(6): 289-299.
- FL** Schwarz, W. A. and Kirchgessner, M. 1975. zinc metabolism in animals. 14. changes in zinc

content of cow's milk with different zinc supplies. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde* 35(1): 1-8.

- FL** Schwarz, W. A. and Kirchgessner, M. 1975. zinc metabolism in animals. 15. zinc status in bone of dairy cows (tuber coxae) in zinc depletion and repletion. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde* 35(1): 9-17.
- No COC** Schwarzler, C. 1980. investigations on the development of trichosomoides crassicauda and also on the detection of the infection in bd-rats. 49 pp.
- IMM** Schwerdtfegar, M., Batsford, S., Vogt, A., and Kluthe, R. 1980. the effect of dietary histidine and zinc supplementation on the course of spontaneous autoimmune disease in nzb/w mice. *Histidine (Stuttgart)* : 2 46-50.
- CP** Scortegagna, M. and Hanbauer, I. 1998. effect of hydrogen peroxide and transition metals on ap-1 dna-binding activity in tissue cultures of trisomy 16 mouse brain (e16). *Society for Neuroscience Abstracts* 24(1-2): 1516.
- Nut def** Scott, D. B. M. and Sano, M. E. 1975. disruption of estrous-cycle of hamster on a zinc-deficient diet. *Federation Proceedings* 34: 940.
- No Dose** Scott, DA and Fisher, AM. 1938. studies on the pancreas and liver of normal and zinc-fed cats. *Am. J. Physiol.* 121: 253.
- Phys** Scotti De Carolis A, Caporali, M. G., Niglio, T., Ricci, A., and Amenta, F. quantitative histochemistry of timm-staining in the right and left rat hippocampus lack of right-left asymmetries. *Acta Histochemica Et Cytochemica.* 23 (2). 1990. 189-194.
- Unrel** Scozzafava Andrea, Menabuoni Luca, Mincione Francesco, Briganti Fabrizio, Mincione Giovanna, and Supuran Claudiu T(A). 1999. carbonic anhydrase inhibitors. synthesis of water-soluble, topically effective, intraocular pressure-lowering aromatic/heterocyclic sulfonamides containing cationic or anionic moieties: is the tail more important than the ring? *Journal of Medicinal Chemistry* 42(14): 2641-2650.
- Drug** Scozzafava Andrea(A), Cavazza Christine(A), Supuran Claudiu T(A), Saramet Ioana, Briganti Fabrizio(A), and Banciu Mircea D. 1998. complexes with biologically active ligands: part 11. synthesis and carbonic anhydrase inhibitory activity of metal complexes of 4,5-disubstituted-3-mercapto-1,2,4-triazole derivatives. *Metal-Based Drugs* 5(1): 11-18.
- Mix** Seaborn, Carol D. and Nielsen, Forrest H. high dietary aluminum affects the response of rats to silicon deprivation. *Biol. Trace Elem. Res. (1994)* 41(3): 295-304 .
- FL** Seal, C. J. influence of dietary picolinic acid on mineral metabolism in the rat. *Ann. Nutr. Metab. (1988)* 32(4): 186-91.
- In Vit** Seal, C. J. and Heaton, F. W. 1983. chemical factors affecting the intestinal-absorption of zinc invitro and invivo. *British Journal Of Nutrition* 50(2): 317-324.
- CP** Seal, C. J. and Mathers, J. C. 1987. na⁺,k⁺-atpase-dependent zinc transfer by everted gut sacs from rats given different amounts and types of dietary fiber. *Proceedings Of The Nutrition Society* 46: A54.
- No Control** Seal, Christopher J. and Heaton, Frank W. effect of dietary picolinic acid on the metabolism of exogenous and endogenous zinc in the rat. *J. Nutr.* 115(8): 986-93 .

- Alt** Searle, T. W., Murray, J. D., and Baker, P. J. 1992. effect of increased production of growth hormone on body composition in mice: transgenic versus control. *Journal of Endocrinology* 132(2): 285-91.
- In Vit** Seay, M. B., Heard, P. L., and Chaudhuri, G. 1996. surface zn-proteinase as a molecule for defense of leishmania mexicana amazonensis promastigotes against cytolysis inside macrophage phagolysosomes. *Vol. 64, No. 12, Pp. 5129-5137 Infect. Immun.*
- Nut** Sebastian, S., Touchburn, S. P., Chavez, E. R., and Lague, P. C. 1996. the effects of supplemental microbial phytase on the performance and utilization of dietary calcium, phosphorus, copper, and zinc in broiler chickens fed corn-soybean diets. *Poult. Sci.* 75(6): 729-736 .
- Phys** Sechi, L. A(A), Ceriello, A., Griffin, C. A., Catena, C., Amstad, P., Schambelan, M., and Bartoli, E. 1997. renal antioxidant enzyme mrna levels are increased in rats with experimental diabetes mellitus. *Diabetologia* 40(1): 23-29.
- In Vit** Sechrist, J., Nieto, M. A., Zamanian, R. T., and Bronner-Fraser, M. 1995. regulative response of the cranial neural tube after neural fold ablation: spatiotemporal nature of neural crest regeneration and up-regulation of slug. *Development* 121(12): 4103-15.
- Nut** Seco, C., Revilla, M., Hernandez, E. R., Gervas, J., Gonzalez-Riola, J., Villa, L. F., and Rico, H. effects of zinc supplementation on vertebral and femoral bone mass in rats on strenuous treadmill training exercise . *J. Bone Miner. Res. (1998)* 13(3): 508-512.
- Unrel** Seekamp, M., Steegmans, R., <Editors> Flachowsky, G., and Kamphues, J. 1996. residues from the treatment of potato pulp water and their use as feedstuffs. *Landbauforschung Volkenrode, Sonderheft* (169): 171-184.
- FL** Seeling, W., Ahnefeld, F. W., Dick, W., and Fodor, L. 1975. [the biological significance of zinc (author's transl)]. <original> die biologische bedeutung des zinks. *Der Anaesthesist* 24(8): 329-42.
- Drug** Seetioko, A. R. and Coligado, E. C. 1989. effect of forced molting on the productivity of itik and tsaiya ducks. *Philippine Journal of Veterinary and Animal Science* 15(1 & 2): 87-97.
- Unrel** Sefton, M., Sanchez, S., and Nieto, M. A. 1998. conserved and divergent roles for members of the snail family of transcription factors in the chick and mouse embryo. *Development* 125(16): 3111-21.
- Nut def** Segawa, Y., Tsuzuike, N., Tagashira, E., and Yamaguchi, M. preventive effect of .beta.-alanyl-l-histidinato zinc on bone metabolism in rats fed on low-calcium and vitamin d-deficient diets. *Res. Exp. Med. (1992)* 192(3): 213-19.
- Phys** Segawa, Y., Tsuzuike, N., Tagashira, E., and Yamaguchi, M. 1993. preventive effect of beta-alanyl-l-histidinato zinc on the deterioration of bone metabolism in ovariectomized rats. *Biological & Pharmaceutical Bulletin* 16(5): 486-9.
- Phys** Seguela Philippe(A), Haghighi Ali, Soghomonian Jean-Jacques, and Cooper Ellis. 1996. a novel neuronal p-2x atp receptor ion channel with widespread distribution in the brain. *Journal of Neuroscience* 16(2): 448-455.
- Bio Acc** Segues, T., Arola, L., and Alemany, M. essential metal accretion in the tissues of rat pups during lactation. *INT J FETO-MATERN MED.* 2 (2). 1989. 75-82.

- Bio Acc** Segues, T., Arola, L., and Alemany, M. 1987. essential metal status of rat lactating dams. *Biological Research in Pregnancy and Perinatology* 8(1 1ST Half)
- Abstract** Sei, K., Iijima, S., Tachibana, Y., and Matsumoto, N. 1982. combined effects of cadmium and zinc on mouse embryo development invitro. *Teratology* 26: A20.
- Dup** Seidenberg, J. M. and Becker, R. A. 1987. a summary of the results of 55 chemicals screened for developmental toxicity in mice. *Teratog Carcinog Mutagen.* 7(1): 17-28.
- Drug** Seiki, Masao, Aita, Hiroyuki, Mera, Yukinori, Arai, Kaneyasu, Toyama, Seiji, Furuta, Shigeru, Morita, Hitoshi, Hori, Yuko, Yoneta, Tomoyuki, and Tagashira, Eijiro. the gastric mucosal adhesiveness of z-103 in rats with chronic ulcer. *Nippon Yakurigaku Zasshi* (1992) 99(4): 255-63..
- Unrel** Seitaridis, C., Tsangaris, T., Iliadis, N., Zografopoulos, T., and Papadopoulos, C. 1977. bacteriological and histological examinations of endometrium from cowswith symptomless sterility. *Deltion Tes Hellenikes Kteniatrikes Hetaireias (Bulletin of the Hellenic Veterinary Medical Society)* 28(2): 67-72.
- No Dose** Selezneva, T. N., Ternovoi, K. S., and Yermecova, V. M. 1992. thymic serum activity inhibitors study. *International Journal of Immunopharmacology* 14(4): 667-9.
- Abstract** Sella, G. E., Bastomsky, C., Ruf, K. B., Cunnane, S. C., and Horrobin, D. anorexia zyncea. *13TH ANNUAL CONFERENCE, COLUMBIA, MO., USA, JUNE 4-7, 1979. PROC UNIV MO ANNU CONF TRACE SUBST ENVIRON HEALTH.* 13 (0). 1979 (Recd. 1980). 339-347.
- Drug** Seller, Mary J. vitamins, folic acid and the cause and prevention of neural tube defects. *Ciba Found. Symp.* (1994) 181(NEURAL TUBE DEFECTS): 161-79.
- Unrel** Selwyn Michael, Ng, J. Lay Tin, and Choo Hui Lim. 1993. the ph-dependent anion-conducting channel of the mitochondrial inner membrane is potently inhibited by zinc ions. *FEBS (Federation of European Biochemical Societies) Letters* 331(1-2): 129-133.
- Drug** Semenyutin, V. V., Shevchenko, I. M., Semenyutina, S. A., Khachaturova, V. A., and Balabanova, V. M. 1991. effect of fenozan on heifers. *Zootekhniya* (11): 43-46.
- Unrel** Semrau, K. T. 1970.*Feasibility Study of New Sulfur Oxide Control Processes for Application to Smelters and Power Plants. Part I: The Monsanto Cat-Ox Process for Application to Smelter Gases.* <NOTE> Final Rept. APTD-0622
- Unrel** Semrau, K. T. 1970.*Feasibility Study of New Sulfur Oxide Control Processes for Application to Smelters and Power Plants. Part III: The Monsanto Cat-Ox Process for Application to Power Plant Flue Gases.* <NOTE> Final Rept. APTD-0624
- Nut def** Sendelbach, L. E., White, C. A., Howell, S., Gregus, Z., and Klaassen, C. D. effect of sulfhydryl-deficient diets on hepatic metallothionein, glutathione, and adenosine 3'-phosphate 5'-phosphosulfate (paps) levels in rats. *Toxicol. Appl. Pharmacol.* (1990) 102(2): 259-67.
- No Org** Sengupta, T. K. and Chatterjee, S. D. inductive behavior of a zinc oxide point contact rectifier. *Bull. Electrochem.* (1991) 7(6): 289-91 .
- Nut** Senturk, Umit Kemal, Oner, Gulsen, and Izgut, V. Nimet. the effect of cholesterol rich diet on the distribution of trace elements in the brain of rat. *Turk. J. Biol.* (1995) 19(1): 73-9.
- Drug** Seow, W. Kim and Thong, Y. H. 1993. evaluation of the novel anti-inflammatory agent

- tetradrine as a pulpotomy medicament in a canine model. *Pediatric Dentistry* 15(4): 260-266.
- FL** Sepetlieva, K. and Markova, M. effect of diets rich in copper and zinc on serum alkaline phosphatase and ceruloplasmin in experimental carbon disulfide intoxication. *Khig. Zdraveopaz.* (1984) 27(2): 159-63.
- FL** Sepetlieva, K. and Petrova, S. changes in serum lipids in carbon disulfide intoxication under prophylactic diets, enriched with copper and zinc in albino rats. *Khig. Zdraveopaz.* (1984) 27(5): 468-73.
- Phys** Serafini Ruggero, Valeyev Alexander Y, Barker Jeffery L, and Poulter Michael O. 1995. depolarization gaba-activated cl- channels in embryonic rat spinal and olfactory bulb cells. *Journal of Physiology (Cambridge)* 488(2): 371-386.
- Nut def** Seres, David S., Bunk, Michael J., Osborne, Michael P., Rivlin, Richard S., and Tiwari, Raj K. effects of marginal dietary zinc deficiency and vitamin e supplementation on hepatic adenine dinucleotide phosphoribosyl transferase activity in female sprague-dawley rats. *Nutr. Res. (N. Y.)* (1991) 11(4): 337-45.
- No Tox** Serfass, Robert E., Park, Kyeung Eun, and Kaplan, Murray L. 1988. developmental changes of selected minerals in zucker rats. *Proc. Soc. Exp. Biol. Med.* 189(2): 229-39 .
- Nut def** Seri, S., Aquilio E., Continenza, A., and Ricciardi, G. effects of dietary tryptophan bioavailability on zinc absorption in rats. *IRCS Med. Sci.* (1984) 12(5): 452-3.
- Drug** Seri, S. and D'Alessandro, A. blackcurrant seed oil, zinc, and fetal alcohol syndrome. *J. Biol. Res. (Naples)* (1997) 73(1-2): 15-21.
- No Oral** Sermet, Abdurrahman, Atmaca, Mukadder, Ulak, Guner, Diken, Huda, and Ulak, Mustafa. effect of vitamin b6 intake on tissue zinc levels in the rat . *Turk. J. Med. Sci.* (1995) Volume Date 1995, 24(4): 263-5.
- Diss** Serrano, J. V. Jr. 1992. performance and physiological responses of force molted native chicken. *122 Leaves*
- FL** Servetnik-Chalaya, G. K., Aldashev, A. A., Verigina, V. S., Kolesova, O. A., Kim, B. I., Bizhanov, Zh. A., Berdongarova, A. B., and Knysh, V. S. 1988. effect of feeding rats with rice grown in highly saline soils treated with zinc salts on vitamin status. *Voprosy Pitaniya* (2): 45-48.
- No Org** Sestakova Vvana Daniela Miholova(A), Vodickova Hana, and Mader Pavel. 1995. electrochemical behavior of metallothioneins at mercury and carbon electrodes. *Electroanalysis* 7(3): 237-246.
- CP** Setia, M. S., Bremner, I., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. effects of high and low dietary zinc at different protein concentrations on metallothionein-i in rats. <document title>trace elements in man and animals - tema 8:proceedings of the eighth international symposium on trace elements in man and animals. 1022-1023.
- Abstract** Setioko, A. R. and Coligado, E. C. 1987. effect of forced molting treatments on the productivity of itik [mullard] and tsaiya ducks [philippines]. *Philippine Journal of Veterinary and Animal Sciences.* V. 13(4) P. 46-47
- Phys** Setiorini, R., Inouye, M., and Oda S-I. effects of zinc chloride mercuric chloride and cadmium chloride on preimplantation mouse embryos in-vivo. *Environmental Medicine (Nagoya).* 35 (0).

1991. 135-138.

Drug	Seto, Koichi, Yoneta, Tomoyuki, Suda, Hiroshi, and Tamaki, Hajime. effect of polaprezinc (n-(3-aminopropionyl)-l-histidinato zinc), a novel antiulcer agent containing zinc, on cellular proliferation: role of insulin-like growth factor i. <i>Biochem. Pharmacol.</i> (1999) 58(2): 245-250.
Mix	Settlemyre, C. Thomas and Matrone, Gennard. in vivo effect of zinc on iron turnover in rats and life span of the erythrocyte. <i>J. Nutr.</i> (1967) 92(2): 159-64 .
Fate	Settlemyre, C. Thomas and Matrone, Gennard. in vivo interference of zinc with ferritin iron in the rat. <i>J. Nutr.</i> (1967) 92(2): 153-8 .
HHE	Sever, L. E. zinc and human development a review. <i>Human Ecology.</i> 3 (1). 1975 43-57.
Mix	Seyoum, G. and Persaud, T. V. N. influence of zinc on ethanol-induced placental changes in the rat. <i>Histol. Histopathol.</i> (1995) 10(1): 117-25 .
Drug	Seyoum, G., Persaud, T. V. N., and Desjardins, P. R. influence of zinc supplementation on alcohol embryopathy in the rat. <i>Res. Commun. Subst. Abuse</i> (1994) 15(1-2): 51-62.
No Oral	Seyoum, Girma and Persaud, T. V. N. ethanol effects on postimplantation rat embryos. influence of zinc and methionine. <i>Exp. Toxicol. Pathol.</i> (1997) 49(3/4): 267-271.
No Oral	Seyoum, Girma and Persaud, T. V. N. protective influence of zinc against the deleterious effects of ethanol in postimplantation rat embryos in vivo. <i>Exp. Toxicol. Pathol.</i> (1995) 47(1): 75-9.
Food	Shackelford, M. E., Collins, T. F. X., Black, T. N., Ames, M. J., Dolan, S., Sheikh, N. S., Chi, R. K., and O'Donnell, M. W. mineral interactions in rats fed ain-76a diets with excess calcium. <i>Food Chem. Toxicol.</i> (1994) 32(3): 255-63.
Carcin	Shackelford, M. E. and Tobey, R. A. attempted use of zinc in vivo to protect against nitrogen mustard toxicity in tumor-free and in l1210 leukemia-bearing b6d2f1 mice. <i>Report (1989) LA-11474; Order No. DE90002969, . Avail.: NTIS From: Energy Res. Abstr.</i> 1990, 15
No Oral	Shackelford, M. E. and Tobey, R. A. 1989. a preliminary report on zinc-induced resistance to nitrogen mustard toxicity in mice. <i>Report (1988) LA-11447; Order No. DE89003458, 15 Pp. Avail.: NTIS From: Energy Res. Abstr.</i> 1989, 14,3. <i>Abstr. No.</i> 5243.
No Oral	Shackelford, M. E. and Tobey, R. A. 1988. <i>Preliminary Report on Zinc-Induced Resistance to Nitrogen Mustard Toxicity in Mice.</i> LA-11447
No Oral	Shackelford, Mary E. and Tobey, Robert A. preliminary report on the use of zinc in vivo to protect against nitrogen mustard toxicity in female balb/cj mice. <i>J. Appl. Toxicol.</i> (1992) 12(4): 291-3 CODEN: JJATDK; ISSN: 0260-437X.
No Oral	Shafa, F., Meisami, E., and Mousavi, R. retarding effect of early anosmia on growth of the body brain olfactory bulbs and cerebellum and its implications for the development of the olfactory system in the rat. <i>Experimental Neurology.</i> 6 (1). 1980. 215-233.
No COC	Shafey, T. M. and McDonald, M. W. 1991. the effects of dietary concentrations of minerals, source of protein, amino acids and antibiotics on the growth of and digestibility of aminoacids by broiler chickens. <i>British Poultry Science</i> 32(3): 535-544.
Mix	Shah, B. G. and Belonje, B. 1984. bioavailability of zinc in beef with and without plant protein

concentrates. *Nutr. Res. (N. Y.)* 4(1): 71-7 .

- No COC** Shah, B. G., Belonje, B., and Nera, E. A. 1980. reduction of nephrocalcinosis in female rats by additional magnesium and by fluoride. *Nutrition Reports International* 22(6): 957-963.
- HHE** Shah, B. G., Giroux, A., and Belonje, B. bio availability of zinc in infant cereals. *Nutrition and Metabolism.* 23 (4). 1979. 286-293.
- Nut def** Shah, B. G., Giroux, A., Belonje, B., and Jones, J. D. beneficial effect of zinc supplementation on reproduction in rats fed rapeseed protein concentrate. *Nutr. Metab. (1979)* 23(4): 275-85.
- Nut def** Shah, B. G., Giroux, A., Belonje, B., and Jones, J. D. 1979. optimal level of zinc supplementation for young rats fed rapeseedprotein concentrate. *Journal of Agricultural and Food Chemistry* 27(2): 387-389.
- Nut def** Shah, B. G., Jones, J. D., McLaughlan, J. M., and Beare-Rogers, J. L. beneficial effect of zinc supplementation in young rats fed protein concentrate from rapeseed or mustard. *Nutr. Rep. Int. (1976)* 13(1): 1-8 .
- HHE** Shah, B. G., Nera, E. A., Verdier, P. C., Beare-Rogers, J. L., Jones, J. D., Amjou, K., and Ohlson, R. 1980. growth, blood chemistry and histology of rats fed zinc-supplemented rapeseed protein concentrates. *Qualitas Plantarum. = ; Plant Foods For Human Nutrition.* 30 (3/4): 223-233.
- Nut def** Shah, Bhagwan G., Giroux, Alexander, Belonje, Bartholomeus, and Jones, John D. optimal level of zinc supplementation for young rats fed rapeseed protein concentrate. *J. Agric. Food Chem. (1979)* 27(2): 387-9.
- Drug** Shahbazian, L. Masoud, Wood, Steven, and Watson, Ronald R. ethanol consumption and early murine retrovirus infection influence liver, heart, and muscle levels of iron, zinc, and copper in c57bl/6 mice. *Alcohol.: Clin. Exp. Res. (1994)* 18(4): 964-8.
- Nut def** Shaheen, A. A. and El-Fattah, A. I. A. Abd. effect of zinc deficiency and supplementation on some aspects of adrenocortical function in rats . *Bull. Fac. Pharm. (Cairo Univ.) (1993)* 31(3): 335-8.
- Nut def** Shaheen, Amira A. and El-Fattah, Amal A. Abd. effect of dietary zinc on lipid peroxidation, glutathione, protein thiols levels and superoxide dismutase activity in rat tissues. *Int. J. Biochem. Cell Biol. (1995)* 27(1): 89-95.
- Mineral** Shahkhalili, Yasaman and Mettraux, Christine. relative importance of carbohydrate and protein sources in the differential effects of soy-based vs casein-based formulas on bone minerals in rats. *Am. J. Clin. Nutr. (1991)* 53(4): 947-53.
- No Oral** Shaikh, Z. A. and Lucas, O. J. 1972. biological differences in cadmium and zinc turnover. *Archives of Environmental Health* 24(6): 410-418.
- No COC** Shajahan, G. M. and Coligado, E. C. 1982. the effect of zinc bacitracin, copper and quindoxin on the small intestine of broilers. *Bangladesh Veterinary Journal.* 16(1/4): 71-77.
- Drug** Shakya, Urmila, Chen, Yong-Hong, Wang, Xiao-Hong, and Tang, Chao-Shu. effect of metallothionein on tolerance of nitroglycerin in rats. *Zhongguo Yaoli Xuebao (2000)* 21(1): 87-90.
- FL** Shal'nova, N. D. 1973. [experimental data on the hygienic evaluation of the pesticide tzikos]. <original> eksperimental'nye materialy k gigienicheskoi otsenke pestitsida tsikosa. *Gigiena i*

Sanitariia 38(12): 55-8.

- FL** SHAL'NOVA, N. D. study of the effect of tsikos on the reproductive function of experimental animals. *VOPR GIG PITAN* 3:41-47,1975
- Nut def** Shalaby Thanaa Ebrahim, Megahed Magda Abdel Ghany(A), and Elewa Samia= Mohamed. 1998. effects of dietary copper deficiency on some aspects of lipids and trace elements in rats. *Journal of the Medical Research Institute* 19(2): 20-30.
- CP** Shami, A. S. and Davis, James Thomas. zinc metabolism in the testis. *Symp. Hum. Nutr. Health Near East Proc.*, 3rd (1967): 94-106.
- FL** Shan, A. effects of zinc and calcium levels in hen diets on fertility and hatchability of the egg and filial newborn chick. *Scientia Agricultura Sinica*. 23 (6). 1990. 82-86.
- FL** Shan, A. S. 1990. effects of zinc and calcium in hen diet on mineral contents in neonatalchicks and their shell residues. *Chinese Journal of Animal Science* 26(4): 3-5.
- FL** Shan, Anshan. effects of zinc and calcium levels in hen diets on egg fertility and chick hatchability. *Zhongguo Nongye Kexue (Beijing)* (1990) 23(6): 82-6.
- FL** Shan Anshan and Wang An (Northeast Agricultural Coll., Harbin China. 1990. effects of dietary zinc and calcium level on performance, blood biochemical parameter and zinc content in tissues of the layer. *Acta Veterinaria Et Zootechnica Sinica*. V. 21(4) P. 295-301
- FL** Shan Anshan, Waug An, and Xu Zhenyeng (Northeast Agricultural Coll., Harbin China. 1989. effects of dietary zinc and calcium levels on egg quality and zinc content in egg of layers. *Acta Zoonutrimenta Sinica*. V. 1(1) P. 51-56
- FL** Shan Anshan (Northeast Agricultural Coll., Harbin China. 1990. effect of zinc and calcium in diet on mineral contents in the body of neonatal chick and the shell residue. *Chinese Journal of Animal Science*. V. 26(4) P. 3-5
- FL** Shan Anshan (Northeast Agricultural Coll., Harbin China. 1992. effects of fiber and various compounds of zinc on retention and concentration of ca, p, mg, na and k in tissues of chicks. *Acta Zoonutrimenta Sinica*. V. 4(1) P. 57
- FL** Shan Anshan (Northeast Agricultural Coll., Harbin China. 1991. effects of zinc and calcium level in hen diets on the filial chicks. *Acta Veterinaria Et Zootechnica Sinica*. V. 22(3) P. 219-225
- No Oral** Shanawany, M. M., Al-Khazraji, A. K., Hamed, O., and Edelsten, P. 1979. effect of protamine zinc insulin on feed intake and weight gain in broiler chicks. *Quarterly Journal of Experimental Physiology and Cognate Medical*
- No Oral** Shank, K. E., Vetter, R. J., and Ziemer, P. L. zinc-cadmium interrelations and the kinetics of cadmium transport in a biological system. *Report (1976) CONF-760632-2, 13 Pp. Avail.: NTIS From: ERDA Energy Res. Abstr. 1976, 1,12. Abstr. No. 26579.*
- CP** Shank, K. E., Vetter, R. J., and Ziemer, P. L. 1976. *Zinc--Cadmium Interrelationships and the Kinetics of Cadmium Transport in a Biological System*
- CP** Shankar, S. and Mohla, S. 1985. effects of prolonged administration of excess dietary vitamin-a and zinc on tissue-lipids in rats. *Proceedings Of The American Association Of Cancer Research* 1985, V26, Mar, P125

- CP** Shankar, S., Sundaresan, P. R., Criss, W. E., and Mohla, S. 1984. effects of prolonged administration of excess dietary vitamin-a and zinc on lipid-metabolism in rats. *Federation Proceedings* 43: 863.
- Mix** Shankar, Sharada, Sundaresan, P. Ramnathan, and Mohla, Suresh. effect of chronic administration of excess dietary vitamin a and zinc on lipid metabolism in rats. *Int. J. Vitam. Nutr. Res.* (1986) 56(4): 329-37 .
- Nut** Shao, Renying, Tang, Ren, and Zhu, Xinjiu. pharmacokinetics of zinc glutamate solution in rabbits. *Zhongguo Yiyao Gongye Zazhi* (1992) 23(3): 114-16.
- Unrel** Shapiro Bernard H(A), Pampori Nisar A, Ram Prabha A, and Waxman David J. 1993 . irreversible suppression of growth hormone-dependent cytochrome p450 2c11 in adult rats neonatally treated with monosodium glutamate. *Journal of Pharmacology and Experimental Therapeutics* 265(2): 979-984.
- HHE** Sharda, B. and Bhandari, B. 1983. oral zinc therapy in indian childhood cirrhosis.
- Unrel** Sharif Ismail Mat(A) and Azahan Engku Ahmed Engku. 1992. effect of roofing materials on housing environment and layer performance under open-shed system. *MARDI Research Journal* 20(1): 61-66.
- Phys** Sharma, A., Lee, Y. B., Murray, J. D., and Oberbauer, A. M. 1996. skeletal muscle growth of omtla-ogh transgenic mice. *Growth, Development, and Aging* 60(1): 31-41.
- Fate** Sharma, G., Sandhir, R., Nath, R., and Gill, K. 1991. effect of ethanol on cadmium uptake and metabolism of zinc and copper in rats exposed to cadmium. *The Journal Of Nutrition.* 121(1): 87-91.
- In Vit** Sharma, M. and Korytnyk, W. 1980. modifications at c-3 and c-4 of 2-amino-2-deoxy-d-glucose. *Carbohydrate Research* 79(1): 39-51.
- No COC** Sharma, M. L., Kansal, M. L., and Ichhponani, J. S. 1986. efficiency of some homoeopathic feed additives for commercial broilers. *Indian Journal of Animal Production and Management* 2(1): 30-34.
- Org Met** Sharma, M. L., Shingari, B. K., and Ichhponani, J. S. 1985. effect of bacitracin feeding on the requirement of floor space in laying hens. *Indian Journal of Poultry Science* 20(3): 223-224.
- Fate** Sharma, R. P. 1985. interactions of cis-platinum with cellular zinc and copper in rat-liver and kidney tissues. *Pharmacological Research Communications* 17(2): 197-206.
- Abstract** Shaw, N. A., Dickey, H. C., Brugman, H. H., Blamberg, D. L., and Witter, J. F. effects of zinc deficiency on female tan rabbits. *J ANIM SCI. Journal of Animal Science.* 35 (1). 1972 224
- Nut def** Shaw, N. A., Dickey, H. C., Brugman, H. H., Blamberg, D. L., and Witter, J. F. 1974. zinc deficiency in female rabbits. *Laboratory Animals* 8(1): 1-7.
- FL** Shawki, G. and El-Sadawy, H. A. Zagazig Univ. Egypt Faculty of Veterinary Medicine. 1993. serum zinc profile during late pregnancy and parturition in buffaloes. *Zagazig Veterinary Journal.* V. 21(5) P. 885-892
- Nut def** Shay, N. F(A), Ezzatkhah, M., Prisecaru, V. I., and Mangian, H. F. 1999. zinc deficiency does not affect self-selection of dietary protein in 2-choice macronutrient preference tests using albumin or purified amino acids. *FASEB Journal* 13(4 PART 1): A215.

- CP** Shay, N. F(A), Li G(A), Kennedy, K. J(A), and Shoemaker, J. D. 1996. urinary alpha-ketoglutarate, thymine, and pyrophosphate excretion by zinc deficient rats. *FASEB Journal* 10(3): A193.
- CP** Shay, N. F(A), O'brien S(A), and Beverly, J. L. 1997. absence of 2-deoxy-d-glucose-mediated feeding by zinc deficient rats. *FASEB Journal* 11(3): A15.
- Rev** Sheffy, B. E., <Editors> Burger, I. H., and Rivers, J. P. 1989. the 1985 revision of the national research council nutrient requirements of dogs and its impact on the pet food industry. 11-26.
- FL** Sheianov, G. G. and Zaichik, V. E. 1974. [zinc chemography in histological structures of the pancreas]. <original> khemografiia tsinka v gistologicheskikh strukturakh podzheludochnoi zhelezy. *Arkhir Patologii* 36(10): 76-7.
- Org Met** SHEIKHER, C. and JAIN, S. D. damage and hoarding by rodents and their control in standing wheat in himachal pradesh (india). *TROP PEST MANAGE*; 37 (3). 1991. 298-300.
- No COC** SHEIKHER, C. and Jain S. D. 1991. damage and hoarding by rodents and their control in standing wheat in himachal pradesh (india). *Trop.Pest Manag.* 37(3): 298-300.
- No COC** SHEIKHER, C. and Jain S. D. 1996. mode of application and performance of rodenticides in vegetable crops. *Indian J.Agric.Sci.* 66(7): 437-440.
- No COC** SHEIKHER, C. and Jain S. D. 1997. rodents in cauliflower and cabbage: population, damage and control. *Int.J.Pest Manag.* 43(1): 63-69.
- FL** Shen Anshan (Northeastern Agricultural Coll., Harbin China. 1993. effects of fiber and various zinc compounds on performance, blood biochemical parameters and zinc concentrations in tissues of chicks. *Acta Veterinaria Et Zootechnica Sinica.* V. 24(1) P. 29-35
- No COC** Shen JianZhong, Xiao, XiLong, and Zhu BeiLei. 1995. studies on the growth-promoting effect of virginiamycin on broilers. *Acta Agriculturae Universitatis Pekinensis* 21(1): 100-103.
- Nut def** Sheng, Xiaoyang, Hong, Zhaoyi, Zhang, Yiwen, and Zhou, Jiande. effects of zinc in brain development. *Yingyang Xuebao (1994)* 16(2): 115-20.
- FL** Sheng Xiaoyang, Hong Zhaoyi, Zhang Yiwen, and Zhou Jiande. 1994. study on the effects of zinc in brain development. *Acta Nutrimenta Sinica* 16(2): 115-120.
- Nut** Sheng, Y., Pero, R. W., Olsson, A. R., Bryngelsson, C., and Hua, J. 1998. dna repair enhancement by a combined supplement of carotenoids, nicotinamide, and zinc. *Cancer Detection and Prevention* 22(4): 284-92.
- Nut** Sherman, A. R., Helyar, L., and Wolinsky, I. 1985. effects of dietary protein concentration on trace minerals in rat tissues at different ages. *The Journal Of Nutrition.* 115(5): 607-614.
- Nut** Sherman, Adria R., Helyar, Lesley, and Wolinsky, Ira. effects of dietary protein concentration on trace minerals in rat tissues at different ages. *J. Nutr. (1985)* 115(5): 607-14 .
- Nut def** Sherman, Adria Rothman, Guthrie, Helen A., and Wolinsky, Ira. interrelationships between dietary iron and tissue zinc and copper levels and serum lipids in rats. *Proc. Soc. Exp. Biol. Med. (1977)* 156(3): 396-401.
- Nut def** Sherman, Adria Rothman and Tissue, Nancy Tschiember. tissue iron, copper and zinc levels in offspring of iron-sufficient and iron-deficient rats. *J. Nutr. (1981)* 111(2): 266-75.

- Mineral** Sherman, G. E., Meyer, M. P., and Coldwell, J. R. 1990. *Analysis of Bethel, Kivalina (Red Dog), and Omalik Lagoon As Port Sites for Use by the Mineral Industry.* <NOTE> Open File Rept. BUMINES-OFR-22-90
- CP** Sherman, S. S., Sinha, R., Smith, J. C., and Soares, J. H. 1985. effect of dietary zinc and ovariectomy on osteopenia in rats. *Federation Proceedings* 44: 882.
- No COC** Sherman, S. S., Smith, J. C. Jr., Tobin, J. D., and Soares, J. H. Jr. 1989. ovariectomy, dietary zinc, and bone metabolism in retired breeder rats. *American Journal Of Clinical Nutrition.* 49(6): 1184-1191.
- Alt** Sherman, Sheryl S., Smith, J. C. Jr., Tobin, Jordan D., and Soares, Joseph H. Jr. ovariectomy, dietary zinc, and bone metabolism in retired breeder rats. *Am. J. Clin. Nutr.* (1989) 49(6): 1184-91 .
- Gene** Sheshberadaran, H. and Takahashi, J. S. 1994. characterization of the chicken rhodopsin promoter: identification of retina-specific and glass-like protein binding domains. *Molecular and Cellular Neurosciences* 5(4): 309-18.
- Unrel** Shetlar, C. L., Cogan, D. C., Sparkman, G. W., Wang, M. M., and Shetlar, M. R. zinc and ethanol: dietary interrelationships in pregnant rats. *Alcohol* (1986) 3(2): 145-52 CODEN: ALCOEX; ISSN: 0741-8329.
- Unrel** Shetlar, C. L., Shetlar, M. R., Cogan, D. C., Yan, L. L., and Wand, M. M. 1987. zinc and ethanol - the effects of maternal dietary zinc and alcohol on mineral levels of the rat fetus. *Research Communications In Substances Of Abuse* 8: 166-167.
- FL** Shevchenko, A. I., Khakhulin, N. A., Tokarev, A. S., and Magomedov, Shch. T. 1984. use of mathematical planning methods in experiments for estimating dietary standards for poultry. *Sel'Skokhozyaistvennaya Biologiya* (4): 25-27.
- FL** Shevchenko V L and Dubyansky M A. 1986. on the cases of birds being poisoned by grain baits including zinc phosphide. *EKOLOGIYA* 124(MOSCOW): 85-86.
- No Dose** Shevchuk, I. A. 1973. *Zinc Metabolism and the Activity of Alkaline Phosphatase in the Kidneys of White Rats in Alloxan Diabetes and in Repeated Administration of Insulin (Obmen Tsinka i Aktivnost Shchelochnoi Fosfatazy v Pochkakh Belykh Pri Alloksanovom Diabete i Povtornykh Vvedeniyakh Insulina).* EPA-TR-74-123
- FL** Shevchuk, I. A., Lopushanskaya, T. F., and Sandulyak, L. I. 1975. zinc metabolism and morphological and histochemical changes in adrenal glands following repeated doses of insulin. *Fiziol. Biokhim. Patol. Endokr. Sist.* 5: 46-50.
- No Oral** Shevchuk, I. A. and Mel'nik, T. F. effect of zinc sulfate on the course and termination of alloxan diabetes. *Mikroelem. Med.* (1968): No. 1, 63-8 .
- FL** Shevchuk, I. A. and Sandulyak, L. I. effect of splanchnotomy and insulin hypoglycemia on the levels of catecholamines, ascorbic acid and zinc in the adrenal glands of albino rats. *Probl. Endokrinol.* (1969) 15(5): 99-103.
- FL** Shevchuk, I. A., Yarmolchuk, G. M., and Mardar, A. I. 1973. effects of hypophysectomy on zinc content and its histotopography in rat organs and tissues. *Arkh. Anat. Gistol. Embriol.* 65(8): 53-6.
- Unrel** Shevelev, N. S., Simon'yants, E. G., Ivanov, A. A., Borovskikh, A. M., and Karpukhin, A. I.

1990. metabolism of trace elements in high-yielding cows in relation to the diet. *Izvestiya Timiryazevskoi Sel'Skokhozyaistvennoi Akademii* (4): 115-122.
- Nut** Shevelev, N. S., Simon'yants, E. G., Ivanov, A. A., Borovskikh, A. M., and Karpukhin, A. I. trace element metabolism in highly productive cows as a function of diet. *IZV TIMIRYAZEV S-KH AKAD. Izvestiya Timiryazevskoi Sel'Skokhozyaistvennoi Akademii*. 0 (4). 1990. 115-122.
- Nut def** Shi, H. N., Scott, M. E., Koski, K. G., Boulay, M., and Stevenson, M. M. energy restriction and severe zinc deficiency influence growth, survival and reproduction of *Heligmosomoides polygyrus* (nematoda) during primary and challenge infections in mice. *Parasitology* (1995) 110(5): 599-609.
- Nut def** Shi, Hai Ning, Scott, Marilyn E., Stevenson, Mary M., and Koski, Kristine G. zinc deficiency impairs T cell function in mice with primary infection of *Heligmosomoides polygyrus* (nematoda). *Parasite Immunol.* (1994) 16(7): 339-50 CODEN: PAIMD8; ISSN: 0141-9838.
- Nut def** Shi HaiNing, Koski, K. G., Stevenson, M. M., and Scott, M. E. Institute of Parasitology Macdonald Campus of McGill University 21 111 Lakeshore Road Ste-Anne de Bellevue Quebec H9X 3V9 Canada. 1997. zinc deficiency and energy restriction modify immune responses in mice during both primary and challenge infection with *Heligmosomoides polygyrus* (nematoda). *Parasite Immunology*. V. 19(8) P. 363-373
- FL** Shi, Ming, Xiao, Jinteng, Hong, Yan, Li, Shutian, Guo, Zhicheng, and Jing, Hongjiang. effect of excessive zinc on growth, development and behavior in weanling rats. *Yingyang Xuebao* (1997) 19(3): 278-282.
- Alt** Shi, Y. X., Ji, X. D., Li, G. S., and Shu, Y. M. 1990. the study on transgenic mice. *Chinese Journal of Biotechnology* 6(3): 189-97.
- BioX** Shi, Yucheng, Zhang, Zhishen, and Guo, Xiyong. experimental preparation of zinc-rich yeast. *Zhongguo Yiyao Gongye Zazhi* (1993) 24(12): 534-7.
- HHE** SHIBATA, H. and IIDA, H. behavior of zinc, cadmium and mercury in mice studied by whole body autoradiography. *ENVIRON POLLUT HUMAN HEALTH PROC INT SYMP INDUST TOXICOL* 1975 698-708, 1977
- CP** Shibata, Hiroshi and Iida, Hiroyoshi. 1977. behavior of zinc, cadmium and mercury in mice studied by whole body autoradiography. *Environ. Pollut. Hum. Health Proc. Int. Symp., 1st : Meeting Date 1975, 696-708. Editor(s): Zaidi, S. H. Publisher: Ind. Toxicol. Res. Cent., Lucknow, India..*
- Phys** Shibata, K., Matsuda, K., Wada, H., Aruga, F., and Yamada, Y. 1991. antigenicity studies on catena(s)-[mu-[n alpha-(3-aminopropionyl)histidinato(2-)-n1,n2,o:n tau]-zinc]. *Arzneimittel-Forschung* 41(10): 1048-52.
- BioX** Shibayama, Y., Asaka, S., and Nakata, K. augmentation of endotoxin hepatotoxicity by zinc. *Exp. Toxicol. Pathol.* (1993) 45(5-6): 351-4.
- FL** Shigihara, J. effects of food additives on the zinc concentration of organs of aged and juvenile rats. *Nichidai Igaku Zasshi*. 49 (6). 1990. 607-618.
- No COC** Shigihara, Junko, Shigihara, Shuntaro, Uchimura, Kumiko, Endo, Sohei, Uchida, Hiroshi, and Tomita, Hiroshi. 1987. effect of food additives on trace metals in organs of rats - icp analysis. *Biryo Kinzoku Taisha* (15): 7-12.

- FL** Shilov, V. P. and Panchenko, I. Ya. 1980. standardization of radionuclide intake by productive animals. *Sel'Skokhozyaistvennaya Biologiya* 16(1): 118-120.
- Meth** Shima Chikako, Tsunoda Kin-Ichi, Akaiwa Hideo(A), Suzuki Keiji, and Nakajima Katsuyuki. 1996. enhancement and stabilization of dithizone vital staining for zinc in rat organs using adduct formation. *Analytical Biochemistry* 236(1): 173-175.
- No COC** Shimada, T., Watanabe, T., and Endo, A. comparative study of the effects of mercuric compounds on the reproduction of female hamsters. *Teratology*. 18 (1). 1978 146-147
- HHE** Shimakawa, T. and Oh, S. Y. effect of zinc supplementation on cell growth and lipo protein binding on human fibroblast cells. 67TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, CHICAGO, ILL., USA, APRIL 10-15, 1983. *FED PROC.* 42 (4). 1983. Abstract 4413.
- Abstract** SHIMAMURA, K., HASEGAWA, N., TERABAYASHI, M., and AOYAMA, T. effects of zinc on benzbromarone teratogenesis in rats. *TERATOLOGY* 22(1):12A,1980
- CP** Shimano, H., Yamada, N., Katsuki, M., Shimada, M., Gotoda, T., Harada, K., Murase, T., Fukazawa, C., Takaku, F., and Yazaki, Y. overexpression of apolipoprotein e in transgenic mice marked reduction in plasma lipoproteins except high density lipoprotein and resistance against diet-induced hypercholesterolemia. *Proceedings of the National Academy of Sciences of the United States of America*. 89 (5). 1992. 1750-1754.
- FL** SHIMIZU, K., SHIRAMA, K., TAKEO, Y., and MAEKAWA, K. changes in intratesticular uptake of cadmium caused by zinc. *ZOOL MAG (TOKYO)*; 84 (3). 1975 (RECD 1976) 222-227
- Alt** Shimizu, Kiyoshi, Takeo, Yuji, Shirama, Kazuhiko, and Maekawa, Kyutaro. relation of collagen or zinc content to organ weight in male sexual accessories of androgen-administered or orchidectomized rats. *Ketsugo Soshiki* (1978) 10(1): 51-5.
- No COC** SHIMIZU, M., YAMANO, T., and NODA, T. effects of zinc 2-mercaptobenzimidazolate on pregnant rats by oral treatment. *JOURNAL OF HEALTH SCIENCE*; 45 (4). 1999. 184-190.
- Drug** Shimizu Norikazu, Fujii Yoshimi, Saito Yoko, Yamaguchi Yukitoshi, and Aoki Tsugutoshi(A). 1997. age-related copper, zinc, and iron metabolism in long-evans cinnamon rats and copper-eliminating effects of d-penicillamine and trientine-2hcl. *Journal of Trace Elements in Experimental Medicine* 10(2): 49-59.
- Nut def** Shimizu, Yukio. 1977. significance of serum zinc in various vascular diseases. effect of zinc on wound healing. *Gifu Daigaku Igakubu Kiyo* 25(2): 173-96.
- Phys** Shimmin, L. C., Chang, B. H., and Li, W. H. 1994. contrasting rates of nucleotide substitution in the x-linked and y-linked zinc finger genes. *Journal of Molecular Evolution* 39(6): 569-78.
- In Vit** Shimokawa Noriaki and Yamaguchi Masayoshi(A). 1992. characterization of bone protein components with polyacrylamide gel electrophoresis: effects of zinc and hormones in tissue culture. *Molecular and Cellular Biochemistry* 117(2): 153-158.
- Nut** Shimoshima, C., Nishioka, C., Takiyama, K., Yuge, O., and Katayama, Y. 1988. influences of protein malnutrition on amino acid composition, tracemetal elements and tensile strength of rat hairs. *Journal of Nutritional Science and Vitaminology* 34(1): 67-78.
- Food** Shinoda, S., Kawaguchi, K., Ishii, T., and Yoshida, T. 1994. effects of acid treatment and extrusion cooking of wheat bran in highbran diet on mineral availability in rats. *Nippon Eiyo*

Shokuryo Gakkaishi = Journal of the Japanese Society of Nutrition and Food Science 47(3): 209-217.

- Alt** Shinoda, S. and Yoshida, T. 1989. influence of sodium phytate and gut microflora on the solubility of ca, mg and zn in the rat digestive tract. *Nutrition Reports International*. 40(5): 909-922.
- FL** Shinoda, Shoko, Kuwata, Gorou, Iwatsuki, Satoshi, Imai, Masatake, and Arai, Soichi. 1995. effects of inositol phosphates (products from phytate) on mineral availability in rats. *Nippon Eiyo Shokuryo Gakkaishi* 48(5): 371-8 .
- Mineral** Shinoda, Shoko and Yoshida, Tsutomu. 1989. effect of sodium phytate in rat diet on solubilities of minerals. *Nippon Eiyo Shokuryo Gakkaishi* 42(5): 397-402.
- No COC** Shinoda, Shoko and Yoshida, Tsutomu. influence of sodium phytate and gut microflora on the solubility of calcium, magnesium, and zinc in the rat digestive tract. *Nutr. Rep. Int.* (1989) 40(5): 909-22 .
- Unrel** Shinogi, Masaki, Sakaridani, Miwa, and Yokoyama, Ikuko. metallothionein induction in rat liver by dietary restriction or exercise and reduction of exercise-induced hepatic lipid peroxidation. *Biol. Pharm. Bull.* (1999) 22(2): 132-136.
- No Oral** Shinohara, A., Chiba, M., and Inaba, Y. effects of administration of rare earth elements on concentrations of essential elements in organs of mice. *Biomed. Res. Trace Elem.* (1993) 4(2): 115-16.
- No Oral** Shippee, R. L., Burgess, D. H., Ciavarra, R. P., and DiCapua, R. A. cadmium-induced suppression of the primary immune response and acute toxicity in mice : differential interaction of zinc. *Toxicol. Appl. Pharmacol.* (1983) 71(2): 303-6 CODEN: TXAPA9; ISSN: 0041-008X.
- No Oral** Shippee, R. L., Burgess, D. H., Ciavarra, R. P., DiCapua, R. A., and Stake, P. E. 1983. cadmium-induced suppression of the primary immune response and acute toxicity in mice: differential interaction of zinc. *Toxicology and Applied Pharmacology* 71(2): 303-6.
- Alt** Shippee, R. L., Stake, P. E., Koehn, U., Lambert, J. L., and Simmons, R. W. III. 1979. high dietary zinc or magnesium as forced-resting agents for layinghens. *Poultry Science* 58(4): 949-954.
- CP** Shippee, R. L., Stake, P. E., Onkelinx, C., Allen, L. H., and Koehn, U. 1979. components of zinc homeostatic control and dietary zinc maintenance requirement of adult male dogs based upon zn-65 compartmental analysis. *Federation Proceedings* 38: 558.
- Abstract** Shippee, R. L., Stake, P. E., and Simmons, R. W. 1977. high dietary zinc and magnesium induction of forced rest in laying hens. *Poultry Science*. 56 (5): 1756-1757
- Nut def** Shippee, Ronald L., Mason, Arthur D. Jr., and Burleson, David G. 1988. the effect of burn injury and zinc nutriture on fecal endogenous zinc, tissue zinc distribution, and t-lymphocyte subset distribution using a murine model. *Proc. Soc. Exp. Biol. Med.* 189(1): 31-8 .
- Diss** Shippee, Ronald Leon. 1984. the antagonistic effect of cadmium upon zinc metabolism in mice as assessed by immunocompetence. *Avail.: Univ. Microfilms Int. Order No. DA8416074 From: Diss. Abstr. Int. B* 1984, 45. 4. 1156. 216 pp.
- Alt** Shiraishi, N., Kondoh, S., Hiraki, Y., Aono, K., and Taguchi, T. 1987. metallothionein in kidney

and liver of the macular mouse as an animal model of menkes' kinky hair disease. *Physiological Chemistry and Physics and Medical NMR* 19(4): 227-33.

- Unrel** Shiraishi, N., Taguchi, T., and Kinebuchi, H. 1991. metallothionein messenger rna levels in the macular mutant mouse: an animal model of menkes' kinky-hair disease. *Biology of the Neonate* 60(1): 52-61.
- No Dose** Shiraishi, Noriyuki, Aono, K., and Taguchi, T. copper metabolism in the macular mutant mouse : an animal model of menkes's kinky-hair disease. *Biol. Neonate* (1988) 54(4): 173-80.
- No Oral** Shiraishi, Noriyuki, Kondo, Shintaro, Hiraki, Yoshio, Aono, Kaname, and Taguchi, Tetsuya. 1987. metallothionein in kidney and liver of the macular mouse as an animal model of menkes' kinky hair disease. *Physiol. Chem. Phys. Med. NMR* 19(4): 227-33.
- Alt** Shiraishi, S., Sato, Y., Oshida, Y., Yoshioka, K., Sakamoto, N., and Yamada, K. studies on the pathogenesis of diabetic angiopathy experimental arteriosclerosis-like lesions induced by hyperinsulinism. *Journal of the Japan Diabetes Society.* 29 (2). 1986. 113-120.
- Org Met** Shivanandappa, T., Ramesh, H. P., and Krishnakumari, M. K. rodenticidal poisoning of non-target animals: acute oral toxicity of zinc phosphide to poultry. *Bull. Environ. Contam. Toxicol.* (1979) 23(4-5): 452-5.
- Drug** Shizuma, Mieko. electrocardiographic effects of tpm-50rf in nephrectomized rats. *Yakuri to Chiryo* (1994) 22(4): 1781-7.
- Mix** Shkunkova, Yu. S. and Tkachuk, V. G. 1974. effect of trace elements on the growth of chickens and the productivity of hens. *Khimiya v Sel'Skom Khozyaistve* 12(8): 614-616.
- Bact** Shoda, Ryosuke and Mori, Kazuhiro. bacterial translocation in the lectin-induced diarrhea as an animal model for persistent diarrhea: development of rational treatment for its complications. *Shoka to Kyushu* (1998) 21(1): 85-88.
- Not Avail** Sholokhov, A. I. and Gorbachev, S. A. 1988. content of sodium, potassium and zinc in semen of of landrace boars on large farms. <document title>vopr. vet. biol. 33-36.
- Unrel** Shopova, M., Mantareva, V., Krastev, K., Hadjiolov, D., Milev, A., Spirov, K., Jori, G., and Ricchelli, F. 1992. comparative pharmacokinetic and photodynamic studies with zinc(ii) phthalocyanine in hamsters bearing an induced or transplanted rhabdomyosarcoma. *Journal of Photochemistry and Photobiology. B, Biology* 16(1): 83-9.
- No COC** Short, R. D., Minor, J. L., Unger, T. M., Breeden, B., and VanGoethem, D. 1980. *Teratology of a Zineb Formulation. EPA-600/1-80-017*
- FL** hpak, G. E. effect of zinc on carbohydrate metabolism in rabbits. *Uch. Zap. Vitebsk. Vet. Inst.* (1969) : 21, 49-54.
- Bio Acc** Shpak, G. E. and Margolin, S. E. interconnection of titanium and zinc in the organs of animals. *S-KH BIOL. Sel'Skokhozyaistvennaya Biologiya.* 6 (4). 1971 567-569.
- Nut def** Shrader, R. E. and Hurley, L. S. 1972. enzyme histochemistry of peripheral blood and bone marrow in zinc-deficient rats. *Laboratory Investigation* 26(5): 566-571.
- Rev** Shrivastav, A. K. and Panda, B. 1999. a review of quail nutrition research in india. *World's Poultry Science Journal.* 55(1): 73-81.

- Nut def** Shrotri, C. K., Mohanty, P., Rathore, V. S., and Tewari, M. N. 1983. zinc-deficiency limits the photosynthetic enzyme-activities in zeamays. *Biochemie Und Physiologie Der Pflanzen* 178(2-3): 213-217.
- CP** Shu, S. Y., Bao, X. M., Li, S. X., and Xu, Z. W. 1993. influence of learning and memory behaviors of the rat after lesioning the marginal division in the rat striatum. *Society for Neuroscience Abstracts* 19(1-3): 366.
- Phys** Shu, S. Y., McGinty, J. F., and Peterson, G. M. 1990. high density of zinc-containing and dynorphin b- and substance p-immunoreactive terminals in the marginal division of the rat striatum. *Brain Research Bulletin* 24(2): 201-5.
- Nut def** Shukla, A., Agarwal, K. N., and Shukla, G. S. 1989. effect of latent iron deficiency on metal levels of rat brain regions. *Biological Trace Element Research* 22(2): 141-52.
- Nut** Shukla, P. K., Shrivastav, A. K., Singh, R. P., and Bedi, S. P. S. Central Avial Research Institute Izatnagar India. 1993. effect of dietary supplementation of zinc on egg production and egg quality characteristics of japanese quail. *Indian Journal of Poultry Science*. V. 28(3) P. 190-194
- No COC** Shumake, S. A. Hakim A. A. and Gaddis S. E. 2002. carbon disulfide effects on pre-baited vs. non-pre-baited rats exposed to low dosage zinc phosphide rodenticide bait. *Crop Prot.* 21(7): 545-550.
- CP** Shumate Melissa D, Lin Dean D, Rikhter Tatiana Y, Gibbs John W Iii, and Coulter Douglas A. 1998. epilepsy-associated alterations in dentate granule cell gabaa receptors precede the onset of spontaneous seizures. *Epilepsia* 39(SUPPL. 6): 61.
- Unrel** Shurson, G. C., Ku, P. K., Waxler, G. L., Yokoyama, M. T., and Miller, E. R. 1990. physiological relationships between microbiological status and dietarycopper levels in the pig. *Journal of Animal Science* 68(4): 1061-1071.
- CP** Shuster, T., Tyburski, M., and Martin, F. 1996. initial phosphorylation of rhodopsin is increased by zinc. *Molecular Biology of the Cell* 7(SUPPL.): 319A.
- Nut** Si, Y. M., Zhang, Z. C., An, M., Lu, X. L., Lu, Q., and Wang, L. 1990. effect of zinc supplementation of the feed on quality of frozen semenfrom holstein bulls. *Chinese Journal of Animal Science* 26(1): 9-12.
- Abstract** Siberio, V., Hill, G., Rozeboom, D., Hogberg, M., Bull, R., and Yokoyama, M. 1996. effects of dietary cr supplementation on the retention of cu and zn in stressed baby pigs. *Journal of Animal Science* 74(SUPPL. 1): 54.
- FL** Sicinska, A., Brzozowska, A., Sadowy-Sadowski, J., Jaklewicz, A., Morawiec, M., and Roszkowski, W. 1990. [effect of cellulose on iron, zinc and copper metabolism in growing rats]. <original>wpływ celulozy na gospodarke .ang.zelazem, cynkiem i miedzia u rosnacych szczurow. *Roczniki Panstwowego Zakladu Higieny* 41(1-2): 63-70.
- Nut** Sicinska, Aleksandra, Brzozowska, Anna, Sadowy-Sadowski, Jacek, Jaklewicz, Andrzej, Morawiec, Marek, and Roszkowski, Wojciech. dietary fiber effect on the metabolism of iron, zinc, and copper in growing rats. *Rocz. Panstw. Zakl. Hig.* (1990) 41(1-2): 63-70
- No Oral** Sieck, M. H. and Baumbach, H. D. differential effects of peripheral and central anosmia producing techniques on spontaneous behavior patterns. *Physiology & Behavior*. 13 (3). 1974 407-425.

- Mix** Siewicki, T. C., Sydlowski, J. S., Van Dolah F M, and Balthrop, J. E. Jr. influence of dietary zinc and cadmium on iron bioavailability in mice and rats oyster vs. salt sources. *Journal of Nutrition*. 116 (2). 1986. 281-289.
- Abstract** SIKOV, M. R., SMITH, V. H., and MAHLUM, D. D. embryotoxicity of the calcium and zinc salts of diethylenetriaminepentaacetic acid(dtpa)in wistar rats. *TERATOLOGY* 11:34A,1975
- FL** Silva, R. M. 1979. analysis of trace elements in the serum, liver and pancreas of sheep infected with gastro-intestinal nematodes using atomic absorption spectrophotometry. *Arquivos Da Escola De Veterinaria Da Universidade Federal De Minas Gerais* 31(3): 488-489.
- FL** Silva, R. M., Ferreira Neto, J. M., and Sampaio, I. B. M. 1978. effect of diet and gastrointestinal parasites on copper, iron and zincin the blood serum of sheep. *Arquivos Da Escola De Veterinaria Da Universidade Federal De Minas Gerais* 30(3): 261-274.
- No COC** Silva, R. M., Martins Ferreira Neto J, and Barbosa Machado Sampaio I. influence of diet and intestinal parasites on copper iron and zinc in blood serum of sheep. *Arquivos Da Escola De Veterinaria Universidade Federal De Minas Gerais*. 30 (3). 1978 (Recd. 1979). 261-274.
- Prim** Silveira, L. C., de Matos, F. M., Pontes-Arruda, A., Picanco-Diniz, C. W., and Muniz, J. A. 1996. late development of zif268 ocular dominance columns in primary visual cortex of primates [published erratum appears in brain res 1997 may 16;757(1):164-5]. *Brain Research* 732(1-2): 237-41.
- No COC** Silverman, B. and Rivlin, R. S. ethanol-provoked disturbances in the binding of zinc to rat jejunal mucosal proteins (effect of alcoholism). *The Journal Of Nutrition*. Apr 1982. v. 112 (4) p. 744-749. ill.
- Alt** Silverstone, B. Z., Kristol, L., Algur, N., Berson, D., and Sternbuch, J. 1987. changes in the zinc and copper-metabolism after panretinal photocoagulation in the rabbit. *Annals Of Ophthalmology* 19(3): 100-103 .
- CP** Siman, C. M(A), Glazier J(A), Pikgongarm R(A), Garland, H. O(A), and Sibley, C. P. A. 1999. identification of mrna for zinc transporting proteins in placenta and effects of streptozotocin diabetes on their expression in rats. *Journal of Physiology (Cambridge)* 517P: 34P.
- FL** Simek, J., Husakova, A., Deml, F., and Dvorackova, I. 1969. hepatic dna synthesis after partial hepatectomy in rats treated with protamin-zn-insulin under different nutritional conditions. *Experientia* 25(8): 791-2.
- FL** Simeonov, S., Pashov, D., Peinikova, T. s., and Dzhurov, A. 1975. [chronic zinc-bacitracin toxicity in chickens]. <original> vurkhu khronichnata toksichnost na tsink-batsitratsina pri pileta. *Veterinaro-Meditsinski Nauki* 12(2): 100-5.
- FL** Simko, S. 1986. efficacy of vibriogal (dimetridazole and furazolidone) againststreponemal dysentery in swine. *Veterinarstvi* 36(9): 416-418.
- CP** SIMMER, K., BREMNER, I., YOUNG, M., and THOMPSON, R. PH. 1985. interaction of cadmium and zinc in pregnancy. *MEETING OF THE MEDICAL RESEARCH SOCIETY*
- Rev** Simmer, K., Pearson, T. C., Wheeler, M. J., and Thompson, R. P. H. 1987. zinc status in polycythemia. *European Journal Of Haematology* 38(5): 433-436.
- Biom** Simmonds, P. L., Luckhurst, C. L., and Woods, J. S. 1995. quantitative evaluation of heme biosynthetic pathway parameters as biomarkers of low-level lead exposure in rats. *Journal of*

- No COC** Simmons, D. J., Grynpas, M. D., and Rosenberg, G. D. maturation of bone and dentin matrices in rats flown on the soviet biosatellite cosmos 1887. *FASEB J.* (1990) 4(1): 29-33.
- FL** Simon, F., Laczay, P., Giro-Szasz, E. Allatorvostudományi Egyetem Budapest Hungary Gyógyszertani Tanszék, and Voros, G. Allattenyesztési és Takarmányozási Kutatóközpont Herceghalom Hungary. 1987. growth promoting effect of zinc-bacitracin and virginiamycin administered simultaneously with different ionophoric coccidiostats in broilers. <original> a cinkbacitracin és a virginiamicin hozamfokozó hatásának vizsgálatát különbozón ionofor coccidiostatikumokkal történő együttes adagolás esetén broilercsikre. *Magyar Allatorvosok Lapja*. V. 42(5) P. 283-287
- FL** Simon, Ferenc, Kovacs, Andras B., and Somogyvari, Kalman. promotion of wound healing in white rats by oral administration of zinc sulfate. *Magy. Allatorv. Lapja* (1970) 25(5): 257-60 CODEN: MGALA5.
- FL** Simonian, M. A., Galstian, D. A., and Demirchoglian, I. G. 1985. [factors reducing the superoxide dismutase activity of the liver of rats with pliss lymphosarcoma]. <original> o faktorakh ponizheniia superoksiddismutaznoi aktivnosti v pecheni krys s limfosarkomoi plissa. *Biokhimiia* 50(5): 768-73.
- FL** Simonik, I. Okresni Veterinarni Sprava Karvina CSFR, Pavelka, J., and Kudlac, E. 1991. chemical contamination of cervical mucus in cows in relation to conception and age. <original> kontaminace cervikalniho hlenu krav chemickymi prvky ve vztahu ke koncepci a veku. *Veterinarni Medicina - UVTIZ*. V. 36(4) P. 193-202
- FL** Simonyan, A. A. and Badalyan, R. B. calcium(2+)- and zinc(2+)-dependent enzymatic hydrolysis of atp in the brain and liver of chickens in ontogenesis. *Dokl. - Akad. Nauk Arm. SSR* (1987) 85(3): 121-4.
- No Oral** Simonyan, M. A(A), Karapetyan, A. V., Galstyan, D. A., Simonyan, R. M., and Babayan, M. A. 1996. superoxide-producing lipoprotein as a factor of tumor growth suppression, enhancement of leukocyte number, and acceleration of cell division in culture. *Biochemistry (Moscow)* 61(9): 1117-1120.
- Unrel** Simpson, G. D. and Nakaue, H. S. 1987. performance and carcass quality of broilers reared on wire flooring, plastic inserts, wood slats, or plastic-coated expanded metal flooring each with or without padded roosts. *Poultry Science* 66(10): 1624-1628.
- In Vit** Simpson, J. the interaction of di thio threitol and acetyl coenzyme a in a radiochemical assay for rat brain atp citrate oxalo acetate lyase ec-4.1.3.8. *Journal of Neurochemistry*. 37 (1). 1981. 100-106.
- In Vit** Simsek, G., Andican, G., Unal, E., Hatemi, H., Yigit, G., and Candan, G. 1997. calcium, magnesium, and zinc status in experimental hyperthyroidism. *Biological Trace Element Research* 57(2): 131-137.
- No Oral** Singal, P. K., Dhillon, K. S., Beamish, R. E., and Dhalla, N. S. 1981. protective effect of zinc against catecholamine induced myocardial changes electro cardiographic and ultrastructural studies. *Laboratory Investigation*. 44(5): 426-433.
- Nut def** Singal, P. K., Kapur, N., Dhillon, K. S., Beamish, R. E., and Dhalla, N. S. 1982. role of free radicals in catecholamine-induced cardiomyopathy. *Canadian Journal of Physiology and Pharmacology* 60(11): 1390-7.

- No Oral** Singal, Pawan K., Dhillon, Kundan S., Beamish, Robert E., and Dhalla, Naranjan S. 1981. protective effect of zinc against catecholamine-induced myocardial changes. electrocardiographic and ultrastructural studies. *Lab. Invest.* 44(5): 426-33 .
- Surv** Singal, S. P. and Lohan, I. S. 1988. studies on the incidence and reproductive management of infertility inbreedable dairy animals in rural haryana state-india. (Paper No. 544): 3pp.
- Nut def** Singh, A. P., Netra, P. R., Vashistha, M. S., and Sharma, S. N. 1994. zinc deficiency in cattle. *Indian Journal of Animal Sciences* 64(1): 34-40.
- BioAcc** Singh, B. R. and Mishra, V. K. mineral content of grasses and grasslands of the himalayan region india 2. concentration of trace and major elements in grasses in relation to soil properties and climatic factors. *Soil Science.* 143(4): 241-256.
- Nut** Singh, Baljinder, Dhawan, Devinder, Chand, Bakhshish, Mangal, P. C., and Trehan, P. N. trace element distribution in rat brain following lead and lithium supplementation-a study using an edxrf spectrometer. *Appl. Radiat. Isot.* (1995) 46(1): 59-64 CODEN: ARISEF; ISSN: 0883-2889.
- Meth** Singh G(A), Bay, B. H., and Sit, K. H. 1996. effect of zinc on the epithelial lining of mice epididymis: a light microscopic study. *Okajimas Folia Anatomica Japonica* 73(2-3): 129-132.
- Nut def** Singh, J. and Moore-Cheatum, L. protective effect of zinc on carbon monoxide teratogenicity in protein-deficient mice. *Teratology* 1997 Jan;55(1):39
- Alt** Singh, J. N. and Dhalla, N. S. 1975. adenylate cyclase activation in lymphoid tissues during graft-versus-host reaction. *Advances in Cyclic Nucleotide Research* 5: 759-70.
- Bio Acc** Singh, K. and Mehta, R. K. 1975. serum zinc level in sheep. *Indian Journal of Experimental Biology* 13(5): 496-497.
- In Vit** Singh, M. V., Bhatnagar, R., and Malhotra, S. K. 1997. inhibition of connexin 43 synthesis by antisense rna in rat glioma cells. *Vol. 91, No. 365, Pp. 103-123 Cytobios*
- Unrel** Singh, N. P., Atkare, P. S., and Dave, B. K. 1985. nutritional management and estrogen therapy in relation to post partuman oestrus in buffaloes: a note. *Indian Journal of Animal Production and Management* 1(4): 156-159.
- Surv** Singh, P. and Gupta, P. C. studies on soil plant animal relationship of zinc in buffaloes of haryana region india. *Indian Journal of Animal Sciences.* 48 (11). 1978. 816-820.
- No Oral** Singh, P. J., Tucker, A. M., and Hofer, M. A. 1976. effects of nasal zinc sulfate irrigation and olfactory bulbectomy on rat pups. *Physiology & Behavior.* 17(3): 373-382.
- No Oral** Singh, P. J., Tucker, A. M., and Hofer, M. A. 1976. effects of nasal znso4 irrigation and olfactory bulbectomy on rat. *Physiology & Behavior* 17(3): 373-82.
- Org Met** SINGH, R. and SAXENA, Y. the phenomenon of bait shyness in black rat, rattus rattus rufescens (gray). *PAK J ZOOL*; 23 (1). 1991. 65-68.
- No COC** Singh, R. and Saxena Y. 1991. the phenomenon of bait shyness in black rat, rattus rattus rufescens (gray). *Pak.J.Zool.* 23(1): 65-68.
- Nut** Singh, R. V., Tewari, N., Singh, C. V., and Singh, Y. P. 1988. estimation of minerals and their association with economic traits in f1crossbred cows. *Indian Journal of Animal Sciences* 58(5):

610-614.

- Fate** SINGH, R. V., TEWARI, N., SINGH, C. V., and SINGH, Y. P. path coefficient analysis of mineral in blood serum affecting first lactation milk yield in crossbred cows. *INDIAN J ANIM SCI*; 58 (8). 1988. 994-996.
- CP** Singh, S., Shamal, S., and Singh, S. retinal changes in chick embryos induced by excess zinc. *22ND ANNUAL MEETING OF THE JAPANESE TERATOLOGY SOCIETY, TOKYO, JAPAN, JULY 8-9, 1982. TERATOLOGY. 26 (1). 1982. 11a-12a.*
- CP** Sinha, R., Sherman, S. S., Smith, J. C., and Soares, J. H. 1985. effect of dietary zinc (zn) and age on differential calcification of bones in female rats. *Federation Proceedings* 44: 1152.
- Abstract** Sinha, R., Sherman, S. S., Smith, J. C. Jr, and Soares, J. H. Jr. effect of dietary zinc and age on differential calcification of bones in female rats. *69TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ANAHEIM, CALIF., USA, APR. 21-26, 1985. FED PROC. 44 (4). 1985. 1152.*
- No Oral** Sinha, R., Smith, J. Cecil Jr., and Soares, J. H. Jr. the effect of dietary vitamin d metabolites and zinc on normal and ectopic bone formation in weanling rats. *Nutr. Res. (N. Y.) (1993) 13(12): 1393-405 CODEN: NTRSDC; ISSN: 0271-5317.*
- No Dose** SINKELDAM, E. J., LUTEN, J. B., MUYS, T., and BRUYNTJES, J. P. 1987. sub-acute 4-week oral toxicity of cadmium enriched pig liver in rats. *SECOND JOINT MEETING OF THE NEDERLANDSE VERENIGING VOOR TOXICOLOGIE (TOXICOLOGICAL SOCIETY OF THE NETHERLANDS) AND THE BRITISH TOXICOLOGY SOCIETY*
- Nut def** Sinning, A. R., Olson, M. D., and Sandstead, H. H. the effects of zinc deficiency on developing photoreceptors in the rat retina a scanning electron microscopic study. *SCANNING ELECTRON MICROSC. Scanning Electron Microscopy. 1984 (2). 1984. 867-874.*
- Nut def** Sinning, A. R., Olson, M. D., and Sandstead, H. H. 1984. the effects of zinc deficiency on developing photoreceptors in the rat retina: a scanning microscopic study. *Scanning Electron Microscopy (Pt 2): 867-73.*
- In Vit** Sinning, A. R., Olson, M. D., and Sandstead, H. H. 1981. a preliminary-study of the effects of dietary zinc-deficiency on developing photoreceptors in the rat. *Anatomical Record* 199: A238.
- No COC** Sinthusek, G. and Magee, A. C. 1984. relationships of dietary zinc/copper ratios to plasma cholesterol and liver trace mineral deposition in young rats fed saturated and unsaturated fats. *Nutrition Research. 4(5): 841-851.*
- Diss** Sinthusek, Govit. 1983. the effects of zinc and copper supplementation on blood lipids and trace minerals deposition of young male rats fed either coconut oil or corn oil. *Avail.: Univ. Microfilms Int. Order No. DA8315653 From: Diss. Abstr. Int. B 1983, 44. 3. 754. 74 pp.*
- Mix** Sinthusek, Govit and Magee, Aden C. relationships of dietary zinc/copper ratios to plasma cholesterol and liver trace mineral deposition in young rats fed saturated and unsaturated fats. *Nutr. Res. (N. Y.) (1984) 4(5): 841-51 .*
- Phys** Sipos Maurice L, Wysocki Charles J, Nyby John G(A), Wysocki Linda, and Nemura Todd A. 1995. an ephemeral pheromone of female house mice: perception via the main and accessory olfactory systems. *Physiology & Behavior* 58(3): 529-534.

- Drug** Sirakova, I., Christova, Y., Nachev, C., and Sirakov, L. M. 1995. zinc enhances the increase in opiate and angiotensin ii receptors induced by ischaemic hypoxia in the rat brain. *Vol. 23, No. 8, Pp. 545-546 Med. Sci. Res.*
- FL** Siriak, K. and Stanchev, H. 1996. biological utilisation of zinc from organic and inorganic sources in chicken broilers. *Zhivotnov"Dni Nauki* 33(7/8): 17-20.
- QAC** SIROTKIN, A. N., ABRAMOVA, T. N., and RASIN, I. M. peculiarities of zinc-65 metabolism in sheep and substantiation of zinc nutrition rates. *S-KH BIOL; 0 (1). 1985. 105-107.*
- Nut def** Sivakumar, B. and Belavady, B. 1975. effect of zinc on vitamin d-dependent calcium uptake in rat intestine. *Indian Journal of Biochemistry and Biophysics* 12(4): 386-388.
- Nut def** Sivakumar, B. and Belavady, Bhavani. effect of zinc on vitamin d-dependent calcium uptake in rat intestine. *Indian J. Biochem. Biophys. (1975)* 12(4): 386-8.
- Org Met** Siviter, R. J. and Cockle, S. M(A). 1995. peptides related to thyrotrophin-releasing hormone are degraded in seminal plasma by an enzyme similar to prolyl endopeptidase. *Journal of Endocrinology* 144(1): 61-66.
- No Oral** Sjoegren, Sven, Persson, Bertil, and Hammarstroem, Lars. zinc and alkaline phosphatase in developing rat oral mucosa. *Acta Odontol. Scand. (1986)* 44(3): 177-84
- No Oral** Skal'ny, A. V. and Kampov-Polevoi, A. B. zinc sulfate in the prevention of alcohol motivation in rats. *Byull. Eksp. Biol. Med. (1988)* 106(7): 56-7.
- FL** Skaljic, G., Najzar-Fleger, D., and Gomercic, V. 1984. [histologic evaluation of the biologic tolerance of zinc oxyphosphate cement]. <original> histoloska procjena bioloske podnosljivosti cink oksifosfatnog cementa. *Acta Stomatologica Croatica* 18(4): 285-92.
- Unrel** Skene, J. H. and Virag, I. 1989. posttranslational membrane attachment and dynamic fatty acylation of a neuronal growth cone protein, gap-43. *Journal of Cell Biology* 108(2): 613-24.
- Drug** Skerman, T. M., Green, R. S., Hughes, J. M., and Herceg, M. 1983. comparison of footbathing treatments for ovine footrot using formalin or zinc sulphate. *New Zealand Veterinary Journal* 31(6): 91-95.
- HHE** Skinner, J. D., Carruth, B. R., Houck, K. S., Bounds, W., Morris, M., Cox, D. R., Moran, J. 3rd, and Coletta, F. 1999. longitudinal study of nutrient and food intakes of white preschool children aged 24 to 60 months. *Journal of the American Dietetic Association* 99(12): 1514-21.
- No COC** Sklan, D. and Halevy, O. 1982. intracellular transport of tocopherol in chick liver cytosol. *Nutrition Reports International* 25(3): 499-505.
- No COC** Sklan, D., Halevy, O., and Donoghue, S. 1987. the effect of different dietary levels of vitamin-a on metabolism of copper iron and zinc in the chick. *International Journal For Vitamin And Nutrition Research* 57(1): 11-18.
- FL** Skorkowska-Zieleniewska, Jadwiga and Oszer, Apolonia. effect of ddt in food on the balance of some mineral elements in rats. *Med. Wet. (1972)* 28(12): 741-3.
- FL** Skrede, A. and Sandvik, R. Norges Landbrugshoegskole Aas Norway. 1990. growth promoting and antibacterial effects of zinc bacitracin in mink diets. *Scientifur. V. 14(2) P. 127-128*
- Anat** SkwarLo-Sonta, K. 1996. functional connections between the pineal gland and immune system.

- Unrel** Slavik, L and Frydrych, Z. studium vlivu dlouhodobé aplikace zn-bacitracinu v krmných směsích na růst krys; a study of influence of a long-termed zn-bacitracin application to feed mixtures on the growth of rats. [zinc]. *Biol Chem Vyzivy Zvirat* 1971 7 (2): 99-103. Eng. sum.
- Carcin** Slavik, M., Narasimhan, T. R., Riley, C., and Slavik, J. 1989. changes in serum copper and zinc during treatment with anticancer drugs interfering with pyridoxal phosphate. *Advances In Experimental Medicine And Biology*. 258 : p. 235-242.
- CP** Slavik, M., Wu, J., and Slavik, J. biochemical changes during nutrition with zinc deficient diet. *75TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ATLANTA, GEORGIA, USA, APRIL 21-25, 1991. FASEB (FED AM SOC EXP BIOL) J.* 5 (5). 1991. A941.
- FL** Slesinger, L. 1972. effect of synthetic ethanol on blood values and fe, cu and zn in tissues of experimental pigs. *Veterinaria, Spofa* 14(1): 45-57.
- Abstract** SLEVIN, J. T. and KASARSKIS, E. J. 1988. coadministration of intracerebroventricular zinc blocks n methyl-d-aspartate-induced electrographic and behavioral seizures. *40TH ANNUAL MEETING OF THE AMERICAN ACADEMY OF NEUROLOGY*
- FL** Slobodkina, K. V. and Chernov, A. N. blood lipoprotein lipase in rabbits in normalcy and in the development of experimental atherosclerosis and the effect of zinc salts on the latter. *Kardiologiya (1971)* 11(3): 120-3 .
- No Dose** Slomianka, Lutz and Geneser, Finn A. postnatal development of zinc-containing cells and neuropil in the hippocampal region of the mouse. *Hippocampus (1997)* 7(3): 321-340.
- Mix** Smart, M. E., Cohen, R., Christensen, D. A., and Williams, C. M. 1986. the effects of sulphate removal from the drinking water on the plasma and liver copper and zinc concentrations of beef cows and their calves. *Canadian Journal of Animal Science* 66(3): 669-680.
- Phys** Smart, T. G., Moss, S. J., Xie, X., and Haganir, R. L. 1991. gabaa receptors are differentially sensitive to zinc: dependence on subunit composition. *British Journal of Pharmacology* 103(4): 1837-9.
- In Vit** Smart, Trevor G. a novel modulatory binding site for zinc on the gabaa receptor complex in cultured rat neurons. *J. Physiol. (London) (1992)* : 447, 587-625.
- Nut def** Smit, John G., Van der Heide, Daan, Van Tintelen, Gerrit, and Beynen, Anton C. thyroid function in rats with iodine deficiency is not further impaired by concurrent, marginal zinc deficiency. *Br. J. Nutr. (1993)* 70(2): 585-92.
- No Dose** Smith, B. L. 1980. effect of high concentrations of zinc sulphate in the drinking water of grazing yearling dairy cattle. *New Zealand Journal of Agricultural Research* 23(2): 175-178.
- Drug** Smith, B. L. 1977. toxicity of zinc in ruminants in relation to facial eczema. *New Zealand Veterinary Journal* 25(11): 310-312.
- No Oral** Smith, B. L. and Embling, P. P. 1993. sequential changes in the development of the pancreatic lesion of zinc toxicosis in sheep. *Veterinary Pathology* 30(3): 242-247.
- Drug** Smith, B. L., Embling, P. P., and Pearce, M. G. Ruakura Anim. Res. Sta. Ministry of Agric. and Fisheries Hamilton New Zealand. 1983. zinc sulphate in the drinking water of lactating dairy

cows for facial eczema control. *Proceedings of the New Zealand Society of Animal Production (UK)*. V. 43 P. 217-219

- Drug** Smith, B. L., Embling, P. P., Towers, N. R., Wright, D. E., and Payne, E. the protective effect of zinc sulphate in experimental sporidesmin poisoning of sheep. *New Zealand Veterinary Journal* | SN- 0048-0169 | PY- 1977 | VO- 25 | IS- Bodyweight, Sheep Were Given by Mouth 0.125, 0.5 or 2.0 g Zn Daily As Sulphate. Compared With Sheep Given Sporidesmin Without the Zn, Weight Gain Was Greater, Liver Damage and Photosensitisation, and Serum Aspartate Aminotransferase and Total Bilirubin Were Less. Degree of Protection Increased, at a Diminishing Rate, With Amount of Zn. The Protective Dose Was Greater Than Requirement for Growth and Maintenance. The Margin Between the Protective Dose and a Poisonous Amount Was Narrow, and Zn for Protection Against Facial Eczema Cannot Be Recommended.
- Drug** Smith, B. L. and Towers, N. R. 1985. pithomycotoxicosis (facial eczema) in new zealand and the use of zincsalts for its prevention. 70-79.
- Drug** Smith, B. L., Towers, N. R., Jordan, R. B., and Mills, R. A. 1983. zinc in the drinking water of dairy cattle for facial eczema control. *Dairyfarming Annual* 35: 62-74.
- Drug** SMITH, B. L., TOWERS, N. R., MUNDAY, R., MORRIS, C. A., and COLLIN, R. G. 19663. control of the mycotoxic hepatogenous photosensitization, facial eczema, in new zealand. *GARLAND*
- No Control** Smith, B. L. Reynold G. W. and Embling P. P. 1979. effect of method of oral administration of zinc sulphate on acute zinc toxicity in the sheep. *N.Z.J.Exp.Agric.* 7: 107-110.
- Nut def** Smith, B. P., Fisher, G. L., Poulos, P. W., and Irwin, M. R. 1975. abnormal bone development and lameness associated with secondary copper deficiency in young cattle. *Journal of the American Veterinary Medical Association* 166(No.7): 682-688.
- Gene** Smith, C. A., Smith, M. J., and Sinclair, A. H. 1999. expression of chicken steroidogenic factor-1 during gonadal sex differentiation. *General and Comparative Endocrinology* 113(2): 187-96.
- Alt** Smith, D. R., Rodway, M. R., Haniak, W. A., and Bellward, G. D. 1987. hepatic estrogen and androgen receptors and binding proteins in streptozotocin-diabetic male wistar rats. *Diabetologia* 30(12): 957-62.
- Unrel** Smith, Douglas H., Okiyama, Koichi, Thomas, Mark J., and McIntosh, Tracy K. effects of the excitatory amino acid receptor antagonists kynurenate and indole-2-carboxylic acid on behavioral and neurochemical outcome following experimental brain injury. *J. Neurosci.* (1993) 13(12): 5383-92.
- BioX** Smith, G. S., Kiesling, H. E., Hallford, D. M., Finkner, R. E., and French, C. 1989. *Improving Livestock Tolerance of Toxicants in Kochia Toward Increased Use As a Water-Efficient Crop*. <NOTE> Technical Rept. WRR-236
- BioX** Smith, G. S., Kiesling, H. E., Hallford, D. M., Finkner, R. E., and French, C. improving livestock tolerance of toxicants in kochia toward increased use as a water-efficient crop. *Report (1989) WRR-236; Order No. PB89-171508, Avail.: NTIS From: Gov. Rep. Announce. Index U. S.) 1989, 89(14. Abstr. No. 936,909. 93 pp.*
- No COC** Smith, H. W. and Tucker, J. F. 1980. further observations on the effect of feeding diets containing avoparcin, bacitracin and sodium arsenilate on the colonization of the alimentary tract of poultry by salmonella organisms. *Journal of Hygiene* 84(1): 137-150.

- Drug** Smith, J. A., Butler, T. C., and Poole, D. T. 1973. effect of protein depletion in guinea-pigs on glucuronate conjugation of chloramphenicol by liver microsomes. *Biochemical Pharmacology* 22(8): 981-3.
- Abstract** Smith, J. C., Failla, M. L., Fields, M., Revett, K. R., and Rose, A. lack of interaction between dietary fructose and zinc nutriture in rats. *70TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 13-18, 1986. FED PROC. 45 (4). 1986. 1082.*
- CP** Smith, J. C., Failla, M. L., Fields, M., Revett, K. R., and Rose, A. 1986. lack of interaction between dietary fructose and zinc (zn) nutriture in rats. *Federation Proceedings* 45: 1082.
- Nut def** Smith, J. C. Jr. 1981. alterations in the kinetics of vitamin a-metabolizing enzymes in rat liver during zinc deficiency. *Proceedings Of The Pennsylvania Academy Of Science.* 55 (2): 183-186.
- Abstract** Smith, J. C. Jr, Brown, E. D., Patterson, J. F., and Kraner, H. U. effect of oral contraceptive hormones on bone and mineral metabolism. *Federation Proceedings.* 35 (3). 1976 683
- Nut def** Smith, J. C. Jr., Calhoun, N. R., Patterson, K. Y., and Howard, M. P. 1980. effect of severe and marginal zinc deficiency on dental cariesdevelopment. *Federation Proceedings* 39(3, I): 431.
- Nut def** Smith, J. C. Jr., Failla, M. L., Fields, M., Rose, A., and Seidel, K. 1987. lack of an effect of dietary fructose on severity of zinc deficiency in rats. *The Journal Of Nutrition.* 117(8): 1443-1446.
- Abstract** Smith, J. C. Jr and Halsted, J. A. clay ingestion geophagia as a source of dietary zinc. *FED PROC. Federation Proceedings.* 29 (2). 1970 297
- Nut def** Smith, J. C. Jr and Halsted, J. A. 1970. clay ingestion (geophagia) as a source of zinc for rats. *Journal of Nutrition* 100(8): 973-80.
- Abstract** Smith, J. C. Jr, Mcdaniel, E. G., Chan, W., and Brown, E. D. effect of zinc therapy and factors associated with growth on vitamin a metabolism. *FED PROC. Federation Proceedings.* 34 (3). 1975 907
- CP** Smith, J. C. Jr, Mcdaniel, E. G., and Doft, F. S. urinary calculi in germ-free rats alleviated by varying the dietary minerals. *HENEGHAN, JAMES B. (ED.). GERMFREE RESEARCH. BIOLOGICAL EFFECT OF GNOTOBIOTIC ENVIRONMENTS. SYMPOSIUM. NEW ORLEANS, LA., U.S.A. APRIL 16-20, 1972. XVIII+673P. ILLUS. ACADEMIC PRESS: NEW YORK, N.Y., U.S.A.; LONDON, ENGLAND. 1973 285-290*
- Nut def** Smith, J. C. Jr, McDaniel, E. G., Fan, F. F., and Halsted, J. A. 1973. zinc: a trace element essential in vitamin a metabolism. *Science* 181(103): 954-5.
- Nut def** Smith, J. Cecil Jr., Brown, Ellen D., McDaniel, E. G., and Chan, Winnie. alterations in vitamin a metabolism during zinc deficiency and food and growth restriction. *J. Nutr. (1976)* 106(4): 569-74.
- Nut def** Smith, J. Cecil Jr., Failla, Mark L., Fields, Meira, Rose, Alice, and Seidel, Karen. lack of an effect of dietary fructose on severity of zinc deficiency in rats. *J. Nutr. (1987)* 117(8): 1443-6.
- Nut def** Smith, J. Cecil Jr., McDaniel, E. G., McBean, L. D., Doft, Floyd S., and Halsted, James A. 1972. effect of microorganisms upon zinc metabolism using germfree and conventional rats. *J. Nutr.* 102(6): 711-19 .

- CP** Smith, J. Cecil Jr., McDaniel, E. G., and McBean, Lois D. 1974. effect of microorganisms upon zinc-65 retention using germfree rats. *Trace Elem. Metab. Anim. Proc. Int. Symp., 2nd* : Meeting Date 1973, 547-9. Editor(s): Hoekstra, W. G. Publisher: Univ. Park Press, Baltimore, Md..
- Nut def** Smith, J. E., Brown, E. D., and Smith, J. C. Jr. 1974. the effect of zinc deficiency on the metabolism of retinol-binding protein in the rat. *Journal of Laboratory and Clinical Medicine* 84(5): 692-7.
- No Oral** Smith, J. F. 1978. effect of zinc on reproduction in sheep. <Document Title>New Zealand, Ministry of Agriculture and Fisheries: Agricultural Research in the New Zealand Ministry of Agriculture And Fisheries. Annual Report of Research Division 1976-77. 58.
- No Oral** Smith, J. F. and Smith, B. L. 1984. effect of premating selenium and zinc treatments on ovulation rate and embryonic mortality in ewes. <document title>new zealand, ministry of agriculture and fisheries. agricultural research division. annual report. 1982/83. 50.
- Abstract** Smith, J. W. II, Arthington, J. D., Tokach, M. D., Goodband, R. D., Nelssen, J. L., Richert, B. T., Owen, K. Q., Bergstrom, J. R., and Nessmith, W. B. Jr. 1996. the effect of supplemental mineral regimen on weanling pig growth performance. *Journal of Animal Science* 74(SUPPL. 1): 57.
- Abstract** Smith, J. W. II, Tokach, M. D., Goodband, R. D., Nelssen, J. L., Nesmith, W. B. Jr, Owen, K. Q., and Richert, B. T. 1995. the effect of increasing zinc oxide supplementation on starter pig growth performance. *Journal of Animal Science* 73(SUPPL. 1): 72.
- Mix** Smith, J. W. II, Tokach, M. D., Goodband, R. D., Nelssen, J. L., and Richert, B. T. 1997. effects of the interrelationship between zinc oxide and copper sulfate on growth performance of early-weaned pigs. *Journal of Animal Science* 75(7): 1861-1866.
- Nut def** Smith, James Cecil and Halsted, James A. clay ingestion (geophagia) as a source of zinc for rats. *J. Nutr.* (1970) 100(8): 973-80 .
- Nut def** Smith, John Edgar, Brown, Ellen D., and Smith, J. Cecil Jr. effect of zinc deficiency on the metabolism of retinol-binding protein in the rat. *J. Lab. Clin. Med.* (1974) 84(5): 692-7
- Abstract** Smith, K. T., Failla, M. L., and Cousins, R. J. zinc absorption by isolated vascularly perfused rat intestine. *FED PROC. Federation Proceedings.* 37 (3). 1978 332
- In Vit** Smith, Kenneth T. and Cousins, Robert J. quantitative aspects of zinc absorption by isolated, vascularly perfused rat intestine. *The Journal Of Nutrition.* Feb 1980. v. 110 (2) p. 316-323. ill., charts.
- Nut def** Smith, Kenneth T., Cousins, Robert J., Silbon, Brian L., and Failla, Mark L. zinc absorption and metabolism by isolated, vascularly perfused rat intestine. *J. Nutr.* (1978) 108(11): 1849-57
- CP** Smith, L. E. H(A), Freedman, S. F., Foley, E. D(A), Mclellan A(A), and Schwartz, P. A. 1994. the effect of overexpression of cu/zn superoxide dismutase on oxygen-induced retinopathy in a transgenic mouse. *Investigative Ophthalmology & Visual Science* 35(4): 1442.
- No COC** Smith, M. O. and Teeter, R. G. 1987. efficacy of narasin, roxarsone and bacitracin combinations in the diet of broiler chickens. *Animal Science Research Report, Agricultural Experiment Station, Oklahoma State University* (MP-119): 184-187.
- No COC** Smith, M. O. and Teeter, R. G. evaluation of halofuginone hydrobromide, bacitracin-zinc and roxarsone in diets of broiler chickens. *Miscellaneous Publication - Agricultural Experiment*

Station, Oklahoma State University. May 1987. (119) p. 173-176.

- No COC** Smith, M. O. and Teeter, R. G. 1987. performance of broiler chickens fed diets containing nicarbazin, roxarsone and bacitracin. *Animal Science Research Report, Agricultural Experiment Station, Oklahoma State University* (MP-119): 177-180.
- CP** Smith, P. J., Samuleson, D. A., and Lewis, P. 1994. influence of dietary zinc levels and excessive light exposure on elemental profiles of melanin granules in the rpe and choroid of young pigs. *Investigative Ophthalmology & Visual Science* 35(4): 1767.
- Unrel** Smits, B., Croft, D. L., and Abrams-Ogg, A. C. G. 1991. lethal acrodermatitis in bull terriers: a problem of defective zinc metabolism. *Veterinary Dermatology* 2(2): 91-96.
- Carcin** Smolinskaya, V. A. effect of a dietary insufficiency of vitamin e on iron, copper, zinc, and cobalt levels in the organs and tissues of rats developing sarcoma m-1. *Mikroelem. Med.* (1972) : No. 3, 148-52.
- Nut def** Smolinskaya, V. A., Matiyash, Yu. M., and Ostapyak, I. M. 1986. chemiluminescence value, activity of metalloenzymes and the concentration of trace elements in blood and organs in vitamin-e-deficient animals. *biokhemiya i fiziologiya sel'skogo khozyaistva*. 45-46.
- Phys** Snaith, Sybil M., Hay, A. J., and Levvy, G. A. relation between the .alpha.-mannosidase activity and the zinc content of mammalian sex organs. *J. Endocrinol.* (1971) 50(4): 659-67 .
- Drug** Snead, D., Barre, P., Bajpai, P. K., Taylor, A., Reynolds, D., Mehling, B., Longo, A., and Nolan, D. 1995. the use of a zinc based bioceramic as an osteoconductive agent in the rat model. *Biomedical Sciences Instrumentation* 31: 141-6.
- Nut** Snedeker, S. M. and Greger, J. L. 1983. metabolism of zinc, copper and iron as affected by dietary protein, cysteine and histidine. *Journal of Nutrition* 113(3): 644-52.
- Nut** Snedeker, Suzanne M. and Greger, J. L. metabolism of zinc, copper and iron as affected by dietary protein, cysteine and histidine. *J. Nutr.* (1983) 113(3): 644-52 .
- No Dose** Snook, J. T. 1971. dietary regulation of pancreatic enzymes in the rat with emphasis on carbohydrate. *American Journal of Physiology* 221(5): 1383-7.
- Unrel** Snuggs, H. M., Cox, C. F., Powell, C. S., and White, K. C. 1993. pulpal healing and dentinal bridge formation in an acidic environment. *Quintessence International* 24(7): 501-10.
- Drug** Snyder, D. R., Gralla, E. J., and Coleman, G. L. 1977. preliminary neurological evaluation of generalized weakness in zinc pyrithione-treated rats. *Food and Cosmetics Toxicology* 15(1): 43-7.
- BioX** Snyder, S. L. and Walker, R. I. 1976. inhibition of lethality in endotoxin-challenged mice treated with zinc chloride. *Infection and Immunity* 13(3): 998-1000.
- BioX** Snyder, Stephen L. and Walker, Richard I. 1976. inhibition of lethality in endotoxin-challenged mice treated with zinc chloride. *Infect. Immun.* 13(3): 998-1000 .
- Unrel** Soares, I., Goldberg, F., Massone, E. J., and Soares, I. M. 1990. periapical tissue response to two calcium hydroxide-containing endodontic sealers. *Journal of Endodontics* 16(4): 166-9.
- CP** Soares, J. H. Jr., Fenton, K., Beecher, G. R., Bodwell, C. E., and Smith, J. C. Jr. 1983. the effect

of dietary zinc and vitamin d steroids on bone turnover using different aged female rats. fifth annual scientific meeting of the american society for bone and mineral research. abstracts. P. 650. Vol. 35, No. 4-5 Calcif. Tissue Int.

- CP** Soares, J. H. Jr, Madara, P. J., and Smith, J. C. Jr. high levels of dietary zinc and copper increase bone resorption in laying quail hens. *73RD ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC. POULT SCI.* 63 (Suppl. 1). 1984. 186.
- Mix** Soares, J. H. Jr., Sherman, S., Sinha, R., Beecher, G. R., Bodwell, C. E., and Smith, J. Cecil Jr. effect of cholecalciferol, 1,25-dihydroxyvitamin d3 and zinc on bone metabolism in the rat. *Nutr. Res. (N. Y.)* (1987) 7(2): 151-64.
- Abstract** Soares, J. H. Jr, Sherman, S. S., Sinha, R., and Smith, J. C. Jr. effect of vitamin d-3 1 25 dihydroxyvitamin d-3 and zinc on bone metabolism. *69TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ANAHEIM, CALIF., USA, APR. 21-26, 1985. FED PROC.* 44 (4). 1985. 883.
- No Oral** Sobocinski, P. Z., Canterburg, W. J. Jr, and Powanda, M. C. 1977. differential effect of parenteral zinc on the course of various bacterial infections. *Proceedings of the Society for Experimental Biology and Medicine.* 156(2): 334-339.
- Abstract** Sobocinski, P. Z., Powanda, M. C., and Canterbury, W. J. 1976. effect of zinc pre treatment on endo toxin induced mortality and hyper amino-acidemia in rats. *Federation Proceedings.* 35(3): 360.
- BioX** Sobocinski, P. Z., Powanda, M. C., Canterbury, W. J., Machotka, S. V., and Walker, R. I. 1976. *Abatement of Hepatocellular Damage and Mortality Incidence by Zinc Treatments in Endotoxemic Rats.* <NOTE> Interim Rept
- BioX** Sobocinski, P. Z., Powanda, M. C., Canterbury, W. J., Machotka, S. V., Walker, R. I. , and Snyder, S. L. 1977. role of zinc in the abatement of hepatocellular damage and mortality incidence in endotoxemic rats . *Infect. Immun.* 15(3): 950-7.
- Abstract** Sobotka, T., Rader, J., Brodie, R., Quander, Y., and West, G. impact of zinc depletion on behavioral function in weanling rats. *71ST ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, WASHINGTON, D.C., USA, MARCH 29-APRIL 2, 1987. FED PROC.* 46 (3). 1987. 903.
- CP** Sobotka, T., Rader, J., Brodie, R., Quander, Y., and West, G. 1987. impact of zinc (zn) depletion on behavioral function in weanling rats. *Federation Proceedings* 46: 903.
- Phys** Soerensen, J. A., Andersen, O., and Nielsen, J. B. an in vivo study of the gastrointestinal absorption site for zinc chloride in mice. *J. Trace Elem. Med. Biol.* (1998) 12(1): 16-22 CODEN: JTEBFO; ISSN: 0946-672X.
- Drug** Soerensen, Jens Ahm and Andersen, Ole. effects of diethyldithiocarbamate and tetraethylthiuram disulfide on zinc metabolism in mice. *Pharmacol. Toxicol. (Copenhagen)* (1989) 65(3): 209-13 CODEN: PHTOEH; ISSN: 0901-9928.
- FL** Soffietti, M. G., Nebbia, C., Biolatti, B., Re, G., Castagnaro, M., Cottino, F., and Guarda, F. 1988. toxicology of fungicides: effects of 270 days administration of zincethylene-bis-dithiocarbamate in friesian cattle. *Schweizer Archiv Fur Tierheilkunde* 130(12): 657-672.
- Meth** Sohn Ock Soon(A) and Fiala Emerich S. 2000. analysis of nitrite/nitrate in biological fluids: denitrification of 2-nitropropane in f344 rats. *Analytical Biochemistry* 279(2): 202-208.

- Phys** Sohnle, P. G., Collins-Lech, C., and Wiessner, J. H. 1991. the zinc-reversible antimicrobial activity of neutrophil lysates and abscess fluid supernatants. *Journal of Infectious Diseases* 164(1): 137-42.
- In Vit** Sohnle, P. G. and Hahn, B. L. 1993. inhibition of pseudohyphal growth as a neutrophil-mediated host defense mechanism against experimental deep candida albicans infections in mice [see comments]. *Journal of Laboratory and Clinical Medicine* 121(2): 235-43.
- Phys** Sok, Dai Eun and Kim, Mee Ree. characterization of a zinc(2+) requiring glycerophosphocholine cholinephosphodiesterase possessing p-nitrophenylphosphocholine phosphodiesterase activity. *Biochem. J.* (1992) 286(2): 435-40.
- FL** Sokolowski, Marek. 1982. toxicity of sodium fluoride to hens. *Zesz. Nauk. Akad. Roln. Wroclawiu Weter.* ((139)): 107-25.
- FL** Sokrut, V. N., Iabluchanskii, N. I., and Shvirenko, I. R. 1991. [the effect of hyperglycemia on the development of experimental myocardial infarct]. <original> vliianie giperglikemii na razvitie eksperimental'nogo infarkta miokarda. *Fiziologicheskii Zhurnal* 37(2): 31-6.
- Nut** Soldatovic, D., Vujanovic, D., Matovic, V., and Plamenac, Z. 1997. compared effects of high oral mg supplements and of edta chelating agent on chronic lead intoxication in rabbits. *Magnesium Research* 10(2): 127-33.
- FL** Sole, D. and Naspitz, C. K. 1996. [zinc, pregnancy and the fetus]. <original> o'zinco, a gestacao e o conceito. *Revista Da Associacao Medica Brasileira* 42(1): 31-8.
- Nut def** Sole, D., Rieckmann, B., Lippelt, R. M., Lippelt, R. T., Amancio, O. M., Queiroz, S. de S, and Naspitz, C. K. 1995. zinc deficient diet consequences for pregnancy and offsprings of wistar rats. *Revista Paulista De Medicina* 113(1): 681-6.
- Unrel** Soliman, M. M., El-Oksh, I. I., and El-Gizy, S. M. H. 1991. effect of organic manure, p, zn and mo on growth and yield of commonbean phaseolus vulgaris l. *Annals of Agricultural Science (Cairo)* 36(2): 589-598.
- HHE** Solomons, N. W. 1986. competitive interaction of iron and zinc in the diet - consequences for human-nutrition. *Journal Of Nutrition* 116(6): 927-935.
- HHE** Solomons, N. W. 1983. competitive mineral mineral interaction in the intestine - implications for zinc-absorption in humans. *Acs Symposium Series* 210: 247-271.
- Nut** Solomons, N. W. 1986. trace-elements in nutrition of the elderly .1. established rdas for iron, zinc, and iodine. *Postgraduate Medicine* 79(6): 231&.
- HHE** Solomons, N. W., Janghorbani, M., Ting, B. T. G., Steinke, F. H., Christensen, M., Bijlani, R., Istfan, N., and Young, V. R. bio availability of zinc from a diet based on isolated soy protein application in young men of the stable isotope tracer zinc-70. *Journal of Nutrition.* 112 (10). 1982. 1809-1821.
- HHE** Solomons, N. W., Marchini, J. S., Duartefavaro, R. M., Vannuchi, H., and Deoliveira, J. E. D. 1983. studies on the bioavailability of zinc in humans - intestinal interaction of tin and zinc. *American Journal Of Clinical Nutrition* 37(4): 566-571.
- HHE** Solomons, N. W., Pineda, O., Viteri, F., and Sandstead, H. H. 1983. studies on the bioavailability of zinc in humans - mechanism of the intestinal interaction of non-heme iron and zinc. *Journal Of Nutrition* 113(2): 337-349.

- Nut def** Somers, M. and Underwood, E. J. ribonuclease activity and nucleic acid and protein metabolism in the testes of zinc-deficient rats. *Aust. J. Biol. Sci.* (1969) 22(5): 1277-82.
- Nut def** Somers, M. and Underwood, E. J. studies of zinc nutrition in sheep ii the influence of zinc deficiency in ram lambs upon the digestibility of the dry matter and the utilization of the nitrogen and sulfur of the diet. *AUST J AGR RES.* 20 (5). 1969 899-903.
- Nut def** Son, S. M. and Magee, A. C. 1987. zinc and vitamin b-6 interrelationships on growth and trace mineral deposition of young rats fed adequate and marginal protein. *Nutrition Reports International* 35(1): 191-203.
- Diss** Son, Sook Mee. 1984. effects of zinc and vitamin b-6 supplementation on growth and mineral deposition of young rats fed various levels of protein. Avail.: Univ. Microfilms Int. Order No. DA8417904 From: Diss. Abstr. Int. B 1984, 45. 5. 1433. 113 pp.
- FL** Song, B. C. and Maeng, W. J. effects of dietary intake on growth and zinc metabolism in rats. *Korean Journal of Animal Nutrition & Feedstuffs.* 14 (3). 1990. 78-83.
- Abstract** Song, M. K. and Adham, N. F. beneficial effect of excess zinc feeding on the outcome of diet induced acute pancreatitis in mice. 73RD ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, NEW ORLEANS, LOUISIANA, USA, MARCH 19-23, 1989. FASEB (FED AM SOC EXP BIOL) J. 3 (3). 1989. A652.
- Nut def** Song, M. K. and Adham, N. F. 1985. relationship between zinc and prostaglandin metabolisms in plasma and small intestine of rats. *American Journal of Clinical Nutrition* 41(6): 1201-1209.
- Nut def** Song, M. K. and Adham, N. F. 1989. role of zinc in treatment of experimental acute pancreatitis in mice. *Digestive Diseases and Sciences* 34(12): 1905-10.
- Nut def** Song, M. K., Adham, N. F., and Ament, M. E. 1985. a possible role of zinc on the intestinal calcium absorption mechanisms in rats. *Nutrition Reports International* 31(1): 43-51.
- Unrel** Song, M. K. and Borowsky, S. 1984. effects of alcohol and carbon tetrachloride on metallothionein metabolism in rat small intestine. *Nutrition Reports International* 30(1): 179-187.
- Fate** Song, M. K. and Mooradian, A. D. 1988. intestinal zinc transport: influence of streptozotocin-induced diabetes, insulin and arachidonic acid. *Life Sciences.* 42(6): 687-694.
- Alt** Song, M. K., Rosenthal, M. J., Kang, K. W., Adham, N. F., Mooradian, A. D., and Ament, M. E. animal prostate extract ameliorates diabetic symptoms by stimulating intestinal zinc absorption in rats. *Diabetes Res.* (1996) 31(4): 157-170.
- Carcin** Song, M. K., Shin, W. Y., Adham, N. F., and Costea, N. V. 1989. zinc, calcium, and magnesium metabolism: effects on plasmacytomas in balb/c mice. *American Journal of Clinical Nutrition* 49(4): 701-7.
- Nut def** Song, Moon K. influence of dietary zinc content on sodium and potassium metabolism in the rat. *Miner. Electrolyte Metab.* (1987) 13(3): 178-82.
- Nut def** Song, Moon K. and Adham, Nabeel F. relationship between zinc and prostaglandin metabolisms in plasma and small intestine of rats. *Am. J. Clin. Nutr.* (1985) 41(6): 1201-9.
- Nut def** Song, Moon K. and Adham, Nabeel F. role of zinc in treatment of experimental acute pancreatitis in mice. *Dig. Dis. Sci.* (1989) 34(12): 1905-10.

Nut def	Song, Moon K., Adham, Nabeel F., and Ament, Marvin E. levels and distribution of zinc, copper, magnesium, and calcium in rats fed different levels of dietary zinc. <i>Biol. Trace Elem. Res.</i> (1986) : 11, 75-88.
Nut def	Song, Moon K., Adham, Nabeel F., and Ament, Marvin E. a possible role of zinc on the intestinal calcium absorption mechanisms in rats. <i>Nutr. Rep. Int.</i> (1985) 31(1): 43-51.
Carcin	Song, Moon K., Adham, Nabeel F., and Costea, Nicholas V. 1984. effect of different levels of dietary zinc on longevity of balb/c mice inoculated with plasmacytoma mopc 104e. <i>J. Natl. Cancer Inst.</i> 72(3): 647-52 .
Carcin	Song, Moon K., Shin, Woo Yung, Adham, Nabeel F., and Costea, Nicolas V. 1989. zinc, calcium, and magnesium metabolism: effects on plasmacytomas in balb/c mice. <i>Am. J. Clin. Nutr.</i> 49(4): 701-7 .
Fate	Sonwane, S. N. and Arora, S. P. 1975. influence of dietary levels of zinc on its secretion in milk. <i>Indian Journal of Dairy Science</i> 28(2): 99-103.
No Oral	Sood, K. C., Goel, V. D., and Sud, S. C. effects of insulin on certain blood parameters in the chicken. <i>Indian Journal of Animal Research.</i> 15 (2). 1981 (Recd. 1982). 112-116.
FL	Sook, J. L. and Myung, W. K. 1992. hypoglycemic effects of korean wild vegetables. <i>Korean Journal of Nutrition</i> 25(6): 511-517.
Nut def	Sorensen, J. A. and Andersen, O. 1989. effects of diethyldithiocarbamate and tetraethylthiuram disulfide on zinc metabolism in mice. <i>Pharmacology & Toxicology</i> 65(3): 209-13.
HHE	Sorenson, A. W. and Butrum, R. R. 1983. zinc and copper in infant diets. <i>Journal Of The American Dietetic Association</i> 83(3): 291-297 .
BioX	Soriano, F., Rodriguez-Tudela, J. L., Castilla, C., and Aviles, P. 1991. treatment of encrusted cystitis caused by corynebacterium group d2 with norfloxacin, ciprofloxacin, and teicoplanin in an experimental model in rats. <i>Antimicrobial Agents and Chemotherapy</i> 35(12): 2587-90.
FL	Soriano Torres J, Bojorquez Narvaez L, Vazquez Oliveros A, and Avila Gonzalez E. bacitracin-zinc effect upon growth and intestinal microflora of broiler chicks. <i>VETERINARIA (Mexico City).</i> 16 (4). 1985 (Recd. 1986). 257-260.
FL	Soriano Torres, J., Bojorquez Narvaez, L., Vazquez Oliveros, A., and Avila Gonzalez, E. 1985. effect of zinc bacitracin on growth and gut microflora of meatchickens. <i>Veterinaria Mexico</i> 16(4): 257-260.
FL	Sortino, G. and Palazzo, U. 1971. [effect of a zinc free diet in rats]. <original> azione della somministrazione di dieta priva di zinco nei ratti. <i>Rivista Italiana Di Stomatologia</i> 26(8): 587-92.
Unrel	Sortino, G. and Palazzo, U. 1971. [zinc and experimental caries in the rat]. <original> zinco e carie sperimentale nel ratto. <i>Rivista Italiana Di Stomatologia</i> 26(7): 509-13.
FL	Sortino, G., Palazzo, U., and Rapisarda, E. 1984. [caries susceptibility and caries resistance induced by cariogenic diets: experimental research]. <original> carierecettività e carieresistenza indotta da diete cariogene integrate: ricerche sperimentali. <i>Stomatologia Mediterranea</i> 4(1): 71-80.
CP	Sosenko Ilene R S(A), Chen Youwei, Ramadurai Sujatha, and Nielsen Heber. 1994. differential

control by t-3 of surfactant, apoprotein mrna, and antioxidant enzyme (aoe) mrna levels in fetal rat lung. *Pediatric Research* 35(4 PART 2): 354A.

- Nut def** Soskel, N. T., Watanabe, S., Hammond, E., Sandberg, L. B., Renzetti, A. D. Jr., and Crapo, J. D. 1982. a copper-deficient, zinc-supplemented diet produces emphysema in pigs. *American Review of Respiratory Disease* 126(2): 316-325.
- Nut def** Souness, J. E., Stouffer, J. E., and De Sanchez V C. effect of selenium deficiency on rat fat cell glucose oxidation. *Biochemical Journal*. 214 (2). 1983. 471-478.
- HHE** Sourla, A. and Koutsilieris, M. 1995. purification and partial sequencing of the major mitogen for human uterine smooth muscle-like cells in leiomyoma extracts. *Journal of Clinical Investigation* 96(2): 751-8.
- Rev** Sousa, C. A., Stannard, A. A., Ihrke, P. J., Reinke, S. I., and Schmeitzel, L. P. 1988. dermatosis associated with feeding generic dog food: 13 cases (1981-1982). *Journal of the American Veterinary Medical Association* 192(5): 676-80.
- In Vit** South, T. L., Blake, P. R., Sowder, R. C. 3d, Arthur, L. O., Henderson, L. E., and Summers, M. F. 1990. the nucleocapsid protein isolated from hiv-1 particles binds zinc and forms retroviral-type zinc fingers. *Biochemistry* 29(34): 7786-9.
- Nut def** Southern, L. L. and Baker, D. H. eimeria acervulina infection and the zinc-copper interrelationship in the chick. *Poult. Sci. (1983)* 62(2): 401-4
- No Dose** Southon, S., Fairweather-Tait, S. J., and Williams, C. M. 1988. fetal growth, glucose tolerance and plasma insulin concentration in rats given a marginal-zinc diet in the latter stages of pregnancy. *The British Journal Of Nutrition*. 59(2): 315-322.
- Phys** Southon, S., Gee, J. M., Bayliss, C. E., Wyatt, G. M., Horn, N., and Johnson, I. T. 1986. intestinal microflora, morphology and enzyme activity in zinc-deficient and zn-supplemented rats. *British Journal of Nutrition* 55(3): 603-611.
- Nut def** Southon, S., Gee, J. M., and Johnson, I. T. 1986. hexose absorption from jejunal loops in situ in zinc-deficient and zn-supplemented rats. *The British Journal Of Nutrition*. 55(1): 193-200.
- Nut def** Southon, S., Gee, J. M., and Johnson, I. T. 1984. hexose transport and mucosal morphology in the small intestine of the zinc-deficient rat. *The British Journal Of Nutrition*. 52(2): 371-380.
- Alt** Southon, S., Kechrid, Z., Wright, A. J. A., and Fairweather-Tait, S. J. 1988. effect of reduced dietary zinc intake on carbohydrate and zn metabolism in the genetically diabetic mouse (c57bl/ksj db+/db+). *The British Journal Of Nutrition*. 60(3): 499-507.
- Nut def** Southon, S., Livesey, G., Gee, J. M., and Johnson, I. T. 1985. intestinal cellular proliferation and protein synthesis in zinc-deficient rats. *The British Journal Of Nutrition*. 53(3): 595-603.
- CP** Southon, S., Williams, C. M., and Fairweather-Tait, S. J. maternal glucose homeostasis in rats given marginal zn diets. *Trace Elements In Man And Animals 6 / Edited By Lucille S. Hurley, ... [Et Al.]*. p. 601-603.
- Acu** Southon, S., Wright, A. J. A., Price, K. R., Fairweather-Tait, S. J., and Fenwick, G. R. 1988. the effect of three types of saponin on iron and zinc absorption from a single meal in the rat. *The British Journal Of Nutrition*. 59(3): 389-396.
- Nut def** Southon, Susan, Fairweather-Tait, Susan J., and Williams, Christine M. fetal growth , glucose

tolerance and plasma insulin concentration in rats given a marginal-zinc diet in the latter stages of pregnancy. *Br. J. Nutr.* (1988) 59(2): 315-22.

- Nut def** Southon, Susan, Gee, Jennifer M., and Johnson, I. T. hexose absorption from jejunal loops in situ in zinc-deficient and zinc-supplemented rats. *Br. J. Nutr.* (1986) 55(1): 193-200
- Nut def** Southon, Susan, Gee, Jennifer M., and Johnson, I. T. hexose transport and mucosal morphology in the small intestine of the zinc-deficient rat. *Br. J. Nutr.* (1984) 52(2): 371-80 CODEN: BJNUAV; ISSN: 0007-1145.
- Mix** Southon, Susan, Johnson, I. T., Gee, Jennifer M., and Price, K. R. the effect of gypsophila saponins in the diet on mineral status and plasma cholesterol concentration in the rat. *Br. J. Nutr.* (1988) 59(1): 49-55 .
- Alt** Southon, Susan, Kechrid, Z., Wright, A. J. A., and Fairweather-Tait, Susan J. effect of reduced dietary zinc intake on carbohydrate and zinc metabolism in the genetically diabetic mouse (c57bl/ksj db +/-db +). *Br. J. Nutr.* (1988) 60(3): 499-507 CODEN: BJNUAV; ISSN: 0007-1145.
- Nut def** Southon, Susan, Livesey, G., Gee, Jennifer M., and Johnson, I. T. intestinal cellular proliferation and protein synthesis in zinc-deficient rats. *Br. J. Nutr.* (1985) 53(3): 595-603 CODEN: BJNUAV; ISSN: 0007-1145.
- No Control** Southon, Susan, Wright, A. J. A., and Fairweather-Tait, Susan J. 1989. the effect of combined dietary iron, calcium and folic acid supplementation on apparent zinc-65 absorption and zinc status in pregnant rats. *Br. J. Nutr.* 62(2): 415-23.
- IMM** Southon, Susan, Wright, A. J. A., Price, K. R., Fairweather-Tait, S. J., and Fenwick, G. R. the effect of three types of saponin on iron and zinc absorption from a single meal in the rat. *Br. J. Nutr.* (1988) 59(3): 389-96 .
- Abstract** Sowinski, J. S(A), Nytes A(A), Barmore, J., and Keith, N. K. 1996. growth and performance of male holstein calves fed milk replacer supplemented with zinc and copper from either organic or inorganic sources. *Journal of Animal Science* 74(SUPPL. 1): 261.
- Nut def** Spais, A. G., Papasteriadis, A., Zafracas, A., and Paschaleris, G. 1975. osteodystrophy associated with zinc deficiency in foals. *Proceedings of the 20th World Veterinary Congress, Thessaloniki* 3: 2103-2106.
- Mineral** Spears, J. W. 1989. zinc methionine for ruminants: relative bioavailability of zinc in lambs and effects of growth and performance of growing heifers. *Journal of Animal Science* 67(3): 835-843.
- Nut** Spears, J. W. and Harvey, R. W. 1987. lasalocid and dietary sodium and potassium effects on mineral metabolism, ruminal volatile fatty acids and performance of finishing steers. *Journal of Animal Science* 65(3): 830-840.
- Phys** Spears, J. W., Harvey, R. W., and Brown, T. T. Jr. 1991. effects of zinc methionine and zinc oxide on performance, blood characteristics, and antibody titer response to viral vaccination in stressed feeder calves. *Journal of the American Veterinary Medical Association* 199(12): 1731-1733.
- Rev** Spears, Jerry W. 1996. organic trace minerals in ruminant nutrition. *Animal Feed Science and Technology* 58(1-2): 151-163.

- CP** Speck, P. A., Wynn, P. C., O'Grady, J., and Hinch, G. N. 1988. enhanced growth in ogh transgenic mice is not due to increased efficiency of feed utilization. *Proceedings of the Nutrition Society of Australia* 13: 96 .
- FL** Speich, Michelle, Metayer, Claire, Arnaud, Pierre, Nguyen Van Goc, and Boiteau, Henri Louis. concentrations of lead, magnesium, calcium, zinc and cadmium in twenty rabbit tissues after exposure to low lead doses and atherogenic diet. *Ann. Nutr. Metab. (1983)* 27(6): 531-41.
- CP** Spencer Corinne M and Yeh Hermes H. 1998. chemosensitivity of granule cells and purkinje cells in the developing rat cerebellum: responses to gaba. *Society for Neuroscience Abstracts* 24(1-2): 793.
- Unrel** Spencer-Dene, B., Thorogood, P., Nair, S., Kenny, A. J., Harris, M., and Henderson, B. 1994. distribution of, and a putative role for, the cell-surface neutral metallo-endopeptidases during mammalian craniofacial development. *Development* 120(11): 3213-26.
- No COC** Spencer, F. 1981. *Effects of Post-Implantation Exposure to Selected Pesticides on Reproductivity in Rats.* <NOTE> Final Rept. EPA-600/1-81-048
- CP** Spencer, F., Chi, L., and Zhu, M. X. 1998. antiproliferative effects of inducible nitric oxide synthase inhibition on decidualization in pseudopregnant rats. *Proceedings of the Society for Experimental Biology and Medicine*; 218
- HHE** Spencer, H., Kramer, L., and Osis, D. 1985. zinc-metabolism in man. *Journal Of Environmental Pathology Toxicology And Oncology* 5(6): 265-278.
- Abstract** Spencer, R. P., Cornelius, E. A., Antar, M. A., and Treves, S. 1970. testicular entry of radio nuclides use in estimating radiation exposure and following systemic diseases. *Federation Proceedings.* 29(2): 247.
- Nut** Sperb, Clovis Oliveira, Chaves Costa, Paulo Tabajara, Zanella, Irineo, and Pinto de Toledo, Geni Salete. levels of microminerals in the diets of brown egg layers. *Rev. Bras. Zootec. (1997)* 26(5): 962-966 .
- No Oral** Speyer Matthew T, Reinisch Lou(A), Cooper Karen A, and Ries, W. Russell. 1998. erythema after cutaneous laser resurfacing using a porcine model. *Archives of Otolaryngology Head & Neck Surgery* 124(9): 1008-1013.
- Plant** Spiers, J. M. 1988. response of 'tifblue' rabbiteye blueberry to soil-applied paclobutrazol. *HortScience* 23(5): 837-839.
- Prim** Spiller, G. A. and Gates, J. E. effect of graded levels of 4 dietary fibers on fecal minerals in pig-tailed monkeys. *FED PROC. Federation Proceedings.* 38 (3 Part 1). 1979 548
- No Dose** Spittle, Susan A. and Failla, Mark L. influence of sex, strain, and species on trace metal status of insulin-deficient diabetic rodents. *Biol. Trace Elem. Res. (1983)* 5(6): 489-502.
- Prim** Spitzer, C., Bushey, D., Strobel, D., Pfaff, J., and Sandstead, H. differences in response to novel objects by zinc deficient rhesus monkeys. *41ST ANNUAL MEETING OF THE MONTANA ACADEMY OF SCIENCES, MISSOULA, MONT., USA, APRIL 3-4, 1981. PROC MONT ACAD.* 41 (0). 1982. 152.
- CP** Spivey Fox M R, Tao S-H, Fry, B. E. Jr, Johnson, M. L., and Fletcher, C. A. zinc deficiency with 5 dietary proteins. *69TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ANAHEIM, CALIF., USA, APR. 21-26, 1985.*

FED PROC. 44 (3). 1985. 543.

- Nut def** Spivey Fox, M. R., Tao, S. H., Stone, C. L., and Fry, B. E. Jr. 1984. effects of zinc, iron and copper deficiencies on cadmium in tissues of japanese quail (*coturnix coturnix japonica*). *E H P Environmental Health Perspectives*. v. 54 : p. 57-65.
- Mix** Spivey, Fox M. R. FDA, Jacobs, R. M., Jones, A. O. Lee, and Fry, Bert E. effects of nutritional factors on metabolism of dietary cadmium at. *Environ Health Perspec.* V28, P107(8)
- Not Avail** Spivey, M. R. and Harrison, Bertha Neal. zinc deficiency and plasma proteins. (1966) 187-201
- Unrel** Spotila, J. R., Spotila, L. D., and Kaufer, N. F. 1994. molecular mechanisms of tsd in reptiles: a search for the magic bullet. *Journal of Experimental Zoology* 270(1): 117-27.
- Gene** Spotila, L. D. and Hall, S. E. 1998. expression of a new rna-splice isoform of wt1 in developing kidney-gonadal complexes of the turtle, *trachemys scripta*. *Comparative Biochemistry and Physiology* 119(4): 761-7.
- Rev** Sprietsma, J. E. 1997. zinc-controlled th1/th2 switch significantly determines development of diseases. *Medical Hypotheses* 49(1): 1-14.
- Nut def** Spry, C. J. F. and Piper, K. G. increased retention of orally administered zinc and raised blood cell zinc concentrations in iron-deficient rats. *Brit. J. Nutr.* (1969) 23(1): 91-6 CODEN: BJNUAV.
- Aquatic** Spry, D. J., Hodson, P. V., and Wood, C. M. 1988. relative contributions of dietary and waterborne zinc in the rainbow-trout, *salmo-gairdneri*. *Canadian Journal Of Fisheries And Aquatic Sciences* 45(1): 32-41.
- Aquatic** Spry, D. J. and Wood, C. M. 1989. the influence of dietary and waterborne zinc on heat-stable metal ligands in rainbow trout, *salmo gairdneri richardson*: quantification by ¹⁰⁹cd radioassay and evaluation of the assay. *Journal of Fish Biology* 35(4): 557-576.
- Aquatic** Spry, D. J. and Wood, C. M. 1989. the influence of dietary and waterborne zinc on heat-stable metal ligands in rainbow trout, *salmo gairdneri richardson*: quantification by ¹⁰⁹cd radioassay and evaluation of the assay. *J. FISH BIOL* VOL. 35, NO. 4: pp. 557-576.
- Nut def** Spurlock, M. E., Browning, J. D., and O'Dell, B. L. 1992. low zinc status in guinea pigs and chicks has no effect on reassemblyrate of brain microtubules. *Journal of Nutritional Biochemistry* 3(11): 594-598.
- Unrel** Squibb, R. L. 1982. *Biochemical Changes in Tissues During Infectious Illness: Bioenergetics of Infection and Exercise*. <NOTE> Annual Progress Rept. No. 16 (Final), 1 Jan 65-30 Jun 80, 1 Jul 80-31 Mar 82
- Alt** Squibb, R. L., Beisel, W. R., and Bostian, K. A. 1971. effect of newcastle disease on serum copper, zinc, cholesterol, and carotenoid values in the chick. *Applied Microbiology* 22(6): 1096-9.
- Rev** Squires, E. J. and Wu, J. 1992. mycotoxins, vitamin e and lipid peroxidation. 82-97.
- No COC** Sreenivasaiah, P. V., Kumar, K. S. P., and Ramappa, B. S. University of Agricultural Sciences Bangalore India. 1986. effect of incorporation of zinc bacitracin in broiler rations. *Indian Journal of Animal Sciences*. V. 56(4) P. 449-452

- FL** Sridhara, S. rodenticide induced bait aversion and neophobia in tatera-indica-cuvieri. *Z ANGEW ZOOL. Zeitschrift Fuer Angewandte Zoologie*. 70 (4). 1983 (Recd. 1984). 429-440.
- Org Met** Sridhara, S. and Srihari, K. 1978. rat infestation and control in mango orchards. *Current Research* 7(7): 120-121.
- Org Met** Sridhara, S. and Srihari, K. susceptibility of the indian field mouse mus-platythrix to two acute rodenticides. *Indian Journal of Experimental Biology*. 25 (7). 1987. 491-492.
- FL** Sridhara, S. and Srihari, K. variability in the development of poison shyness of bandicota-bengalensis-bengalensis towards 2 acute poisons. *Zeitschrift Fuer Angewandte Zoologie*. 65 (2). 1978. 179-186.
- Org Met** Sridhara, Shakunthala and Srihari, K. bait shyness towards zinc phosphide and vacor in the larger bandicoot rat bandicota indica (bechstein). *Indian J. Exp. Biol.* (1980) 18(9): 1029-31 CODEN: IJEBA6; ISSN: 0019-5189.
- Org Met** Sridhara, Shakunthala and Srihari, K. 1979. field and laboratory evaluation of zinc phosphide. *Curr. Res. (Univ. Agric. Sci. Bangalore)* 8(5): 80-2.
- Bact** Srinivas, U., Braconier, J. H., Jeppsson, B., and Hansson, L. influence of zinc deficiency and malnutrition on organ uptake of escherichia coli during gram-negative sepsis in the rat. *Nutr. Res. (N. Y.)* (1989) 9(4): 455-63.
- Bact** Srinivas, U., Braconier, J. H., Jeppsson, B., and Hansson, L. 1989. influence of zinc deficiency and malnutrition on organ uptake of escherichia coli during gram-negative sepsis in the rat. *Nutrition Research*. 9(4): 455-463.
- Prim** Srivastava, A., Chowdhury, A. R., and Setty, B. S. 1986. testicular regulation and sub-cellular distribution of zinc in the epididymis and vas-deferens of rhesus-monkey (macaca-mulatta). *Acta Endocrinologica* 113(3): 440-449.
- Prim** Srivastava, A., Chowdhury, A. R., and Setty, B. S. 1984. zinc content in the epididymis, vas deferens, prostate, and seminal vesicles of juvenile rhesus monkey (macaca mulatta): effect of androgen and estrogen. *Prostate* 5(2): 153-8.
- Prim** Srivastava, A. and Setty, B. S. zinc in the seminal vesicle and cranial and caudal prostate of rhesus monkey (Macaca mulatta): testicular regulation and subcellular distribution. *Andrologia* (1985) 17(6): 579-82.
- Prim** Srivastava, Archana, Chowdhury, A. R., and Setty, B. S. testicular regulation and subcellular distribution of zinc in the epididymis and vas deferens of rhesus monkey (macaca mulatta). *Acta Endocrinol. (Copenhagen)* (1986) 113(3): 440-9.
- Prim** Srivastava, Archana, Chowdhury, A. R., and Setty, B. S. zinc content in the epididymis, vas deferens, prostate, and seminal vesicles of juvenile rhesus monkey (macaca mulatta): effect of androgen and estrogen. *Prostate (N. Y.)* (1984) 5(2): 153-8.
- No COC** Srivastava, D. C. 1992. sugarcane. *Rodents in Indian Agriculture*. 1: 231-248.
- Unrel** St. George T D(A), Murphy, G. M., Burren, B., and Uren, M. F. 1995. studies on the pathogenesis of bovine ephemeral fever iv: a comparison with the inflammatory events in milk fever of cattle. *Veterinary Microbiology* 46(1-3): 131-142.
- Bio Acc** St Louis Vincent L(A), Breebaart Loes, Barlow Jon C, and Klaverkamp Jack F. 1993. metal

accumulation and metallothionein concentrations in tree swallow nestlings near acidified lakes. *Environmental Toxicology and Chemistry* 12(7): 1203-1207.

- No Oral** Stacey, N. H., Wong, K. L., and Klaassen, C. D. 1983. protective effects of chromium on the toxicity of cadmium in vivo. *Toxicology* 28(1-2): 147-53.
- Drug** Staempfli, H. R., Prescott, J. F., Carman, R. J., and McCutcheon, L. J. 1992. use of bacitracin in the prevention and treatment of experimentally-induced idiopathic colitis in horses. *Canadian Journal of Veterinary Research* 56(3): 233-6.
- Bio Acc** Stahl, J. L., Cook, M. E., and Greger, J. L. 1988. zinc iron and copper contents of eggs from hens fed varying levels of zinc. *Journal of Food Composition and Analysis*. 4: 309-315.
- IMM** Stahl, J. L., Cook, M. E., Sunde, M. L., and Greger, J. L. 1989. enhanced humoral immunity in progeny chicks from hens fed practical diets supplemented with zinc. *Applied Agricultural Research* 4(2): 86-89.
- Nut** Stahl, James L., Cook, M. E., and Sunde, M. L. 1986. zinc supplementation: its effect on egg production, feed conversion, fertility, and hatchability. *Poult. Sci.* 65(11): 2104-9 .
- Diss** Stahlbaum, C. C. 1989. the parameters that influence reproductive success in congenic strains of house mice. *Dissertation Abstracts International. B, Sciences and Engineering* 49(12): 5178.
- Nut def** Stahlmann, Ralf, Vormann, J., Gunther, T., Forster, C., Zippel, U., Lozo, E., Schwabe, R., Kociok, K., Shakibaei, M., and Merker, H. J. effects of quinolones, magnesium deficiency, or zinc deficiency on joint cartilage in rats. *Magnesium-Bull. (1997)* 19(1): 7-22.
- Abstract** Stake, P. E., Miller, W. J., Blackmon, D. M., Neathery, M. W., Gentry, R. P., and Ansari, M. S. contribution of pancreatic juice to endogenous zinc excretion in calves fed a practical diet. *Federation Proceedings*. 32 (3 Part 1). 1973 895
- Abstract** Stake, P. E., Miller, W. J., and Gentry, R. P. effect of dietary energy intake and growth rate on zinc metabolism and homeostasis in young ruminants. *Federation Proceedings*. 31 (2). 1972 668
- Nut def** Stake, P. E., Miller, W. J., and Gentry, R. P. 1973. zinc metabolism and homeostasis in ruminants as affected by dietary energy intake and growth rate. *Proceedings of the Society for Experimental Biology and Medicine* 142(2): 494-496.
- Fate** Stake, P. E., Miller, W. J., Gentry, R. P., and Neathery, M. W. 1975. zinc metabolic adaptations in calves fed a high but nontoxic zinc level for varying time periods. *Journal of Animal Science* 40(1): 132-137.
- CP** tallard, L. and Reeves, P. G. 1995. activity of angiotensin converting enzyme (ace) in testicular germ cells and sperm of zn-deficient adult rats. *FASEB Journal* 9(3): A180.
- Unrel** Stanczak, A., Kwapiszewski, W., Szadowska, A., and Pakulska, W. 1994. synthesis and action on the central nervous system of some n2-substituted cinnoline derivatives. *Die Pharmazie* 49(6): 406-12.
- Abstract** Stanger, B. R(A), Hill, G. M(A), Link, J. E(A), Turk, J. R., Carlson, M. S(A), and Rozeboom, D. W(A). 1998. effect of high zn diets on tge-challenged, early weaned pigs. *Journal of Animal Science* 76(SUPPL. 2): 53.
- Nut def** Stangl, G. I. and Kirchgessner, M. effect of different degrees of moderate iron deficiency on the

activities of tricarboxylic acid cycle enzymes, and the cytochrome oxidase, and the iron, copper, and zinc concentrations in rat tissues. *Z. Ernahrungswiss.* (1998) 37(3): 260-268.

- Abstract** Stankiewicz, J. M. and Evans, J. L. potato diet influences on tissue mineral composition in the growing rat. *72ND ANNUAL MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE, ITHACA, N.Y., USA, JULY 27-30, 1980. J ANIM SCI.* 51 (Suppl. 1). 1980 (Recd. 1981). 223.
- FL** Stankunavichene, M. and Malaishkaite, B. 1984. optimum standards for zinc in diets (for pigs). *Svinovodstvo, Moscow* (1): 12-13.
- Abstract** Stannard, J. G. and Goebel, D. M. physiological effects of chronic nitrous oxide exposure. *ANNUAL SESSION OF THE AMERICAN ASSOCIATION FOR DENTAL RESEARCH, CINCINNATI, OHIO, USA, MAR. 17-20, 1983. J DENT RES.* 62 (Spec. Issue). 1983. 247.
- Nut def** Starcher, Barry C., Hill, Charles H., and Madaras, Judy G. effect of zinc deficiency on bone collagenase and collagen turnover. *J. Nutr.* (1980) 110(10): 2095-102.
- Phys** Statter, M. and Krieger, I. 1983. picolinic carboxylase activity in rat liver and kidney. i. influence of growth, sex, gestation, lactation, and nutritional imbalance. *Journal of Pediatric Gastroenterology and Nutrition* 2(1): 166-70.
- No Oral** Steel, E. and Keverne, E. B. 1985. effect of female odour on male hamsters mediated by the vomeronasal organ. *Physiology & Behavior* 35(2): 195-200.
- Nut def** Steel, L. and Cousins, R. J. 1985. kinetics of zinc absorption by luminally and vascularly perfused rat intestine. *American Journal of Physiology* 248(1 Pt 1): G46-53.
- Abstract** Steel, L. and Cousins, R. J. kinetics of zinc absorption by vascularly perfused rat intestine. *68TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 1-6, 1984 FED PROC.* 43 (3). 1984. Abstract 2592.
- Nut def** Steel, Linda and Cousins, Robert J. kinetics of zinc absorption by luminally and vascularly perfused rat intestine. *Am. J. Physiol.* (1985) 248(1, Pt. 1): G46-G53.
- CP** Steel, Linda, McMaster, Dorothy, and Love, A. H. G. 1982. a vascular perfusion technique for the study of zinc absorption. *Trace Elem. Metab. Man Anim. Proc. Int. Symp., 4th : Meeting Date 1981, 117-20.* Editor(s): Gawthorne, J. M.; Howell, J. McC.; White, C. L. Publisher: Springer, Berlin, Fed. Rep. Ger..
- Unrel** Steele Andrew M(A), Gandhi Mysore R, and Sica Anthony L. 1993. phrenic and recurrent laryngeal motoneuron activities during hyperoxia and hypoxia in piglets. *Developmental Brain Research* 74(1): 57-66.
- In Vit** Stefanelli, Claudio, Ferrari, Fabrizia, Pignatti, Carla, Flamigni, Flavio, and Rossoni Caldarera, Carmen. effects of zinc on ornithine decarboxylase activity in rat thymocytes. *Life Chem. Rep.* (1991) : 9, 143-6 .
- Gene** Stegmann, K., Boecker, J., Kosan, C., Ermert, A., Kunz, J., and Koch, M. C. 1999. human transcription factor slug: mutation analysis in patients with neural tube defects and identification of a missense mutation (d119e) in the slug subfamily-defining region. *Mutation Research* 406(2-4): 63-9.
- Phys** Steinbrunner, R. L., Setcos, J. C., and Kafrawy, A. H. 1991. connective tissue reactions to glass

ionomer cements and resin composites. *American Journal of Dentistry* 4(6): 281-4.

- Unrel** Steinebach, O. M. and Wolterbeek, B. T. metallothionein biodegradation in rat hepatoma cells a compartmental analysis aided sulfur-35 radiotracer study. *Biochimica Et Biophysica Acta.* 1116 (2). 1992. 155-165.
- In Vit** Steinebach, O. M. and Wolterbeek, H. T. 1993. determination of zinc-65, copper-64 and sulphur-35 labelled rat hepatoma tissue culture metallothioneins by high-performance liquid chromatography with on-line radioactivity detection. *Journal of Chromatography* 619(2): 199-214.
- IMM** Steinhauer, H. B., Batsford, S., Schollmeyer, P., and Kluthe, R. 1985. studies on thromboxane b2 and prostaglandin e2 production in the course of murine autoimmune disease: inhibition by oral histidine and zinc supplementation. *Clin. Nephrol.* 24(2): 63-8 .
- Drug** Steinhauer, H. B., Batsford, S., Schollmeyer, P., and Kluthe, R. thromboxane b-2 and prostaglandin e-2 production in the course of murine autoimmune disease inhibition by oral histidine and zinc supplementation. *Clinical Nephrology.* 24 (2). 1985. 63-68.
- Carcin** Steinman, R. R. and Leonora, J. 1975. acidogenic potential of cariogenic and noncariogenic diets in the rat. *Journal of Dental Research* 54(3): 578-80.
- Bact** Steinman, R. R. and Leonora, J. 1975. effect of selected dietary additives on the incidence of dental caries in the rat. *Journal of Dental Research* 54(3): 570-577.
- Diss** Steinruck, U. 1989. [investigations on the selective feed intake by chicken fed diets deficient in nutrients and active substances]. <original> untersuchungen zur selektiven Futteraufnahme von hühnern bei naehr- und wirkstoffmangel. 182 P.
- Mineral** Steinruck, U. and Kirchgessner, M. estimation of the zinc requirements of broiler chicks using their ability to self-select zinc and by dose-response relations. *Arch. Anim. Nutr.* (1993) 43(1): 27-43.
- Nut def** Steinruck, U., Kirchgessner, M., and Roth, F. X. the role of experience in the development of selective zinc intake in pullets. *Arch. Anim. Nutr.* (1991) 41(5): 501-11 CODEN: AANUET.
- FL** Steinruck, U. Technische Univ. Muenchen Freising Germany Inst. fuer Ernaehrungsphysiologie. 1990. [is there a specific palatability of nutrients and active substances in poultry?]. <original> existiert ein spezifischer appetit fuer naehr- und wirkstoffe beim gefluegel? *Deutsche Gefluegelwirtschaft Und Schweineproduktion.* V. 42(19) P. 539-544
- FL** Steinruck, U. Technische Univ. Muenchen Freising Germany Inst. fuer Ernaehrungsphysiologie, Kirchgessner, M., and Roth, F. X. 1991. the role of the experience in the development of selective zinc intake in pullets. *Archives of Animal Nutrition.* V. 41(5) P. 501-511
- FL** Stelletsii, V. V. and Korkunov, Yu. P. trace element requirement of adult chickens. *Tr. Krasnoyarsk. Nauch.-Issled. Inst. Sel. Khoz.* (1969) : 5, 288-300.
- FL** Stelzner, D. J. 1971. the relationship between synaptic vesicles, golgi apparatus, and smooth endoplasmic reticulum: a developmental study using the zinc iodide-osmium technique. *Zeitschrift Fur Zellforschung Und Mikroskopische Anatomie* 120(3)
- FL** Stemmer, K. L., Petering, H. G., Murthy, L., Finelli, V. N., and Menden, E. E. copper deficiency effects on cardiovascular system and lipid metabolism in the rat ; the role of dietary proteins and excessive zinc. *Ann. Nutr. Metab.* (1985) 29(6): 332-47.

- IMM** Stephenson, R. A., Luft, B. J., Pedrotti, P. W., and Remington, J. S. 1985. inhibition of mouse natural-killer cell-activity by zinc. *Journal Of The National Cancer Institute* 74(5): 1067-1070.
- CP** Serman, M. B. effects of dietary zinc manipulation on amygdala kindling and related zinc absorption in the cat. WADA, J. A. (ED.). *KINDLING, 3; THIRD INTERNATIONAL SYMPOSIUM, VANCOUVER, B.C., CANADA, MAY 1985. XIX+551P. RAVEN PRESS: NEW YORK, N.Y., USA. ILLUS. ISBN 0-88167-194-0. 0 (0). 1986. 173-184.*
- No Dose** Serman, M. B., Shouse, M. N., Fairchild, M. D., and Belsito, O. 1986. kindled seizure induction alters and is altered by zinc-absorption. *Brain Research* 383(1-2): 382-386.
- Abstract** Serman, M. B., Shouse, M. N., and Farichild, M. D. zinc absorption increases only during amygdala kindling following dietary loading in cats. *ABSTRACTS FROM THE 14TH ANNUAL MEETING OF THE SOCIETY FOR NEUROSCIENCE, PART 1, ANAHEIM, CALIF., USA, OCT. 10-15, 1984. SOC NEUROSCI ABSTR. 10 (1). 1984. 186.*
- Nut def** Serman, M. Barry, Shouse, Margaret N., Fairchild, M. D., and Belsito, Orazio. kindled seizure induction alters and is altered by zinc absorption. *Brain Res. (1986)* 383(1-2): 382-6 CODEN: BRREAP; ISSN: 0006-8993.
- Org Met** Sterner, R. T. and Mauldin, R. E. 1995. regressors of whole-carcass zinc phosphide/phosphine residues in voles: indirect evidence of low hazards to predators/scavengers. *Archives Of Environmental Contamination And Toxicology.* 28(4): 519-523.
- Org Met** STERNER, R. T. and RAMEY, C. A. deterioration of lecithin-adhered zinc phosphide baits in alfalfa. *INTERNATIONAL BIODETERIORATION & BIODEGRADATION; 36 (1-2). 1995. 65-71.*
- Org Met** Sterner, R. T., Ramey, C. A., Edge, W. D., Manning, T., Wolff, J. O., and Fagerstone, K. A. 1996. efficacy of zinc phosphide baits to control voles in alfalfa --an enclosure study. *Crop Protection.* 15(8): 727-734.
- No COC** Sterner, R. T. and Mauldin R. E. 1995. regressors of whole-carcass zinc phosphide/phosphine residues in voles: indirect evidence of low hazards to predators/scavengers. *Arch.Environ.Contam.Toxicol.* 28(4): 519-523.
- No COC** Sterner, R. T. Goldade D. A. and Mauldin R. E. 1998. zinc phosphide residues in gray-tailed voles (*Microtus canicaudus*) fed fixed particles of a 2% grain bait. *Int.Biodeterior.Biodegrad.* 42(2/3): 109-113.
- No COC** Sterner, R. T. Ramey C. A. Edge W. D. Manning T. Wolff J. O. and Fagerstone K. A. 1996. efficacy of zinc phosphide baits to control voles in alfalfa - an enclosure study. *Crop Prot.* 15(8): 727-734.
- No COC** Sterner, Ray T. and Ramey C. A. 2002. an index technique to monitor broadcast calibration and bait pick up, plus rodent and avian sign under arid conditions. *Pest Manag.Sci.* 58(4): 385-391.
- FL** Stetsenko, I. I. 1980. biological availability of zinc from gelatin compounds with amino acidsto early-weaned piglets. *Byulleten' Vsesoyuznogo Nauchno-Issledovatel'Skogo Instituta Fiziologii, Biokhimii i Pitaniya Sel'Skokhozyaistvennykh Zhivotnykh* (2/58): 53-56.
- FL** Stetsenko, I. I. 1981. effect of different forms of zinc compounds in the diet of early-weanedpigs on zinc absorption and deposition. *Byulleten' Vsesoyuznogo Nauchno-Issledovatel'Skogo Instituta Fiziologii, Biokhimii i Pitaniya Sel'Skokhozyaistvennykh Zhivotnykh* (1/61): 30-33.

- FL** Stetsenko, I. I. and Kal'nitskii, B. D. 1981. biological effectiveness of zinc in relation to the type of zinccompound in the diet given to early-weaned pigs. *Nauchnye Trudy, Vsesoyuznyi Nauchno-Issledovatel'Skii Institut Fiziologii, Biokhimii i Pitaniya Sel'Skokhozyaistvennykh Zhivotnykh* 25: 68-79.
- Prim** Stevens, M. D., MacKenzie, W. F., and Anand, V. D. 1977. *Influence of Cage Material on Amount of Zinc in Blood of the Rhesus Monkey Macaca Mulatta* : 3p.
- CP** Stevenson Cynthia L(A) and Hageman Michael J. 1994. characterization of spray-dried and lyophilized suspensions of zinc-bovine somatotropin salts. *Pharmaceutical Research (New York)* 11(10 SUPPL.): S148.
- CP** Stevenson Cynthia L(A) and Hageman Michael J. 1994. diafiltration of aqueous zinc-bovine somatotropin suspensions to remove excess zinc. *Pharmaceutical Research (New York)* 11(10 SUPPL.): S148.
- Carcin** Stevenson, K. A., Keenan, J. F., and Preiss, I. L. 1989. rubidium and zinc fluctuations in selected tissues during the development of the bw7756 murine hepatoma. *International Journal of Radiation Applications and Instrumentation*.
- No COC** Stevenson, M. H. effect of added cassava root meal zinc oxide and their interaction on the production and quality of eggs from laying hens *Journal of the Science of Food and Agriculture*. 36 (10). 1985. 909-914.
- Bio Acc** Stevenson, M. H., Gibson, S. W., and Jackson, N. withdrawal of zinc oxide-containing diets from mature, female domestic fowl: effects on selected tissue mineral contents. *Br. Poult. Sci.* (1987) 28(3): 449-59 .
- Nut def** Stevenson, M. H. and Jackson, N. 1984. comparison of dietary hydrated copper sulphate, dietary zinc oxide and a direct method for inducing a moult in laying hens. *British Poultry Science* 25(4): 505-517.
- Nut** Stevenson, M. H. and Unsworth, E. F. 1978. studies on the absorption of calcium, phosphorus, magnesium, copper and zinc by sheep fed on roughage-cereal diets. *British Journal of Nutrition* 40(3): 491-496.
- Unrel** Stewart, C. M. and Watson, R. E. 1990. experimental oral foreign body reactions. commonly employed dental materials. *Oral Surgery, Oral Medicine, and Oral Pathology* 69(6): 713-9.
- Bio Acc** Stewart, F. M., Phillips, R. A., Bartle, J. A., Craig, J., and Shooter, D. 1999. influence of phylogeny, diet, moult schedule and sex on heavy metal concentrations in new zealand procellariiformes. *Vol. 178, Pp. 295-305* Marine Ecology Progress Series
- Bio Acc** Stewart, F. M., Thompson, D. R., Furness, R. W., and Harrison, N. seasonal variation in heavy metal levels in tissues of common guillemots, uria aalge from northwest scotland. *Arch. Environ. Contam. Toxicol.* (1994) 27(2): 168-75.
- Bio Acc** Stewart, Fiona M., Phillips, Richard A., Bartle, Alexander J., Craig, John, and Shooter, David. influence of phylogeny, diet, moult schedule, and sex on heavy metal concentrations in new zealand procellariiformes. *Mar. Ecol.: Prog. Ser.* (1999) : 178, 295-305.
- In Vit** Stewart, Gregory R., Frederickson, C. J., Howell, G. A., and Gage, F. H. cholinergic denervation-induced increase of chelatable zinc in mossy-fiber region of the hippocampal formation. *Brain Res.* (1984) 290(1): 43-51 .

- Nut def** Stewart, S. R., Emerick, R. J., and Kayongo-Male, H. silicon-zinc interactions and potential roles for dietary zinc and copper in minimizing silica urolithiasis in rats. *J. Anim. Sci.* (1993) 71(4): 946-54.
- No Oral** Stewart, W. B., Greer, C. A., and Teicher, M. H. 1983. the effect of intra nasal zinc sulfate treatment on odor mediated behavior and on odor induced metabolic activity in the olfactory bulbs of neo natal rats. *Developmental Brain Research.* 8(2-3): 247-260.
- No Oral** Stewart, William B., Greer, Charles A., and Teicher, Martin H. the effect of intranasal zinc sulfate treatment on odor-mediated behavior and on odor-induced metabolic activity in the olfactory bulbs of neonatal rats. *Dev. Brain Res.* (1983) 8(2-3): 247-59.
- Nut** Stewart, J. L., Newhouse, C. L., Wagner, M. V., and Bradshaw, W. S. 1984. the effects of pre natal exposure to structurally diverse chemicals on the ontogeny of rat dehydrogenases: *Biology of the Neonate.* 46(2): 69-79.
- Fungus** Steyn, D. G. 197. fungus-infected and fermented feeds dangerous to stock. *Farming South Africa*
- Nut def** Stillard, Lana and Reeves, Philip G. zinc deficiency in adult rats reduces the relative abundance of testis-specific angiotensin-converting enzyme mrna. *J. Nutr.* (1997) 127(1): 25-29.
- Abstract** Stoddart, A. M., Nzelibe, C. G., and Knight, E. M. the effects of dietary fiber on fecal excretion serum cholesterol glucose and triglyceride and fecal iron and zinc in sprague-dawley rats. *70TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 13-18, 1986. FED PROC.* 45 (3). 1986. 595.
- FL** Stoimenov, K. 1976. effect of some microelements on heterakis gallinarum infection. *Veterinarnomeditsinski Nauki* 13(2): 5-11.
- FL** Stoimenov, K. effect of some trace elements on heterakis gallinarum infection. *Vet.-Med. Nauki* (1976) 13(2): 5-11
- Drug** Stojicevic, S., Jovanovic, A., Bresjanac, D., Bozovic, V., and Milcic, D. new treatment for bovine panaritium using urotovet cream. *Veterinarski Glasnik.* 44 (8-9). 1990. 695-698.
- Unrel** Stoltenberg, M., Therkildsen, P., Andreasen, A., Jensen, K. B., Juhl, S., Ernst, E., and Danscher, G. 1998. computer-assisted visualization of the rat epididymis: a methodological study based on paraffin sections autometallographically stained for zinc ions. *Histochemical Journal* 30(4): 237-44.
- FL** Stolzner, W., Grass, M., and Chemnitius, K. H. 1974. [pharmacologic-endocrinological findings in animal experiments with turisynchron and suisynchron. 1. effect on gonadotropic function of the rat hypophysis]. <original> pharmakologisch-endokrinologische befunde bie der prufung von turisynchron und suisynchron im tierexperiment. *Archiv Fur Experimentelle Veterinarmedizin* 28(5): 641-9.
- Acu** Stolzner, W., Grass, M., and Chemnitius, K.-H. 1974. pharmacological and endocrinological findings in animal experiments using turisynchron and suisynchron. pt. 1. effect on pituitarygonadotropic function in the rat. *Archiv Fur Experimentelle Veterinarmedizin* 28(5): 641-649.
- Nut def** Stoncius, L. V., Ashrafi, S. H., and Meyer, J. 1985. ultrastructure of mast cells in the hyperplastic buccal mucosa of the zinc-deficient rat. *Journal of Oral Pathology* 14(5): 375-82.

- No COC** Storelli, C. and Murer, H. correlation between alkaline phosphatase and phosphate transport in rat renal brush border membrane vesicles. *Pfluegers Archiv European Journal of Physiology*. 384 (2). 1980. 149-154.
- Bio Acc** Stower Rosten, L., Atle Kalas, J., Mankovska, B., and Steinnes, E. mercury exposure to passerine birds in areas close to local emission sources in slovakia and norway. *Sci. Total Environ.* (1998) 213(1-3): 291-298.
- CP** Strain, W. H., Pories, W. J., Michael, E., Peer, R. M., and Zaresky, S. A. age and sex effects on trace element absorption from the alimentary tract. *Trace Elem. Metab. Man Anim. Proc. Int. Symp.*, 3rd (1978): Meeting Date 1977, 132-5. Editor(s): Kirchgessner, M. Publisher: Arbeitskreis Tierernaehrungsforschung Weihestephana Inst. Ernaehrungsphysiol., Freising-Weihestephana, Ger. CODEN: 40FLAC.
- CP** Strain, W. H., Scott, M. L., Leach, R. M. Jr, Zeigler, T. R., Huegin, F., Mcevoy, R. K., Lankau, C. A. Jr, Berliner, W. P., and Steadman, L. T. zinc nutrition of chicks through studies of uptake and retention of zinc-65. *GUILLON, ARLETTE (ED.). ISOTOPE STUDIES ON THE PHYSIOLOGY OF DOMESTIC ANIMALS. PROCEEDINGS OF A SYMPOSIUM. ATHENS, GREECE, MARCH 20-24, 1972. 433P. ILLUS. INTERNATIONAL ATOMIC ENERGY AGENCY: VIENNA, AUSTRIA; (DIST. IN U.S.A. BY UNIPUB, INC.: NEW YORK, N.Y.). 1972 (Recd 1973) 367-377*
- FL** Straub, O. C. 1990. [development of an inactivated vaccine for the protection of cattle against aujeszky's disease]. <original> entwicklung eines inaktivierten impfstoffs zum schutz der rinder vor aujeszky'scher krankheit. *Berliner Und Munchener Tierarztliche Wochenschrift* 103(7): 225-9.
- Unrel** Straube, E. F., Schuster, N. H., and Sinclair, A. J. zinc toxicity in the ferret. *J. Comp. Pathol.* (1980) 90(3): 355-61.
- Unrel** Straube, E. F. and Walden, N. B. 1981. zinc poisoning in ferrets (mustella putorius furo). *Laboratory Animals* 15(1): 45-47.
- No Oral** Stricker, E. M., Friedman, M. I., and Zigmond, M. J. 1975. glucoregulatory feeding by rats after intraventricular 6-hydroxydopamine or lateral hypothalamic lesions. *Science* 189(4206): 895-7.
- Unrel** Strittmatter, C. F. 1972. phosphatase activities of chicken liver and duodenum: characteristics, levels during development, and hydrocortisone-induced changes. *Biochimica Et Biophysica Acta* 284(1): 183-95.
- Prim** Strobel, David, Sanstead, Harold, Zimmermann, Linda, and Reuter, Alvin. 1979. prenatal protein and zinc malnutrition in the rhesus monkey, macaca mulatta. *Nursery Care Nonhuman Primates [Proc. Symp.]* : Meeting Date 1977, 43-58. Editor(s): Ruppenthal, Gerald C. Publisher: Plenum, New York, N. Y.
- Prim** Strobel, David A. and Sandstead, Harold H. social and learning changes following prenatal or postnatal zinc deprivation in rhesus monkeys. *Neurol. Neurobiol.* (1984) 11B(Neurobiol. Zinc, Part B): 121-38.
- Invert** Stronach, B. E., Siegrist, S. E., and Beckerle, M. C. 1996. two muscle-specific lim proteins in drosophila. *Journal of Cell Biology* 134(5): 1179-95.
- FL** Stroza, I., Apsite, M., Basova, N. A., Berzins, N., Valinieci, M., Ozols, A., Sheshukova, T. A., Vevere, L., and Bondarenko, V. I. effect of increased doses of zinc in a ration on metabolism and digestion of proteins and sugars in chicks. *Assimilyatsiya Pitatel'Nykh Veshchestv Org. Zhivotn.*

(1986) 93-108. Editor: 93-108. Editor(s): Val'dman, A. R. Publisher: Zinatne, Riga, USSR.

- Nut** Strozha, I., Valdmanis, A., Apsite, M., Basova, N. A., Berzins, N., Vevere, L., and Tarvidas, I. metabolic and digestive processes of chicks response to zinc at different feed levels of vitamin a and antioxidants. *Assimilyatsiya Pitatel'Nyk Veshchestv Org. Zhivotn. (1986)* 72-92. Editor: 72-92. Editor(s): Val'dman, A. R. Publisher: Zinatne, Riga, USSR..
- FL** Strozha, I. K., Val'dman, A. R., Apsite, M. R., Basova, N. A., Berzin', N. I., Ozols, A. Ya., Sheshukova, T. A., Vevere, L. K., and Tarvid, I. L. 1986. influence of supplementary vitamin a on the biological effect of antioxidants on metabolic and digestive processes in chickens. <Document Title> *Fiziologiya Protssessov Vsasyvaniya u Zhivotnykh.* 157-175.
- Nut def** Strozha, I. K., Val'dman, A. R., Apsite, M. R., Basova, N. A., Berzin', N. I., Vevere, L. K., and Tarvid, I. L. 1986. changes in metabolic and digestive processes in chickens caused by zinc during feeding on a diet containing varying amounts of vitamin a and antioxidants. <Document Title> *Assimilyatsiya Pitatel'Nyk Veshchestv v Organizme Zhivotnykh.* 72-92.
- Nut** Strozha, I. K. and Vevere, L. K. 1990. antioxidant effect of nutritional factors. <Document Title> *Usvoenie Organicheskikh i Neorganicheskikh Soedinenii v Organizme Zhivotnykh.* 242-264.
- FL** Struklec, M. and Kermauner, A. 1999. effect of added zn-methionine on production parameters and liver and kidney weights in rabbits. *Krmiva* 41(3): 117-121.
- Nut def** Stuart, M. A., Johnson, P. E., Hamaker, B., and Kirleis, A. absorption of zinc and iron by rats fed meals containing sorghum food products. *Journal of Cereal Science.* 6 (1). 1987. 81-90.
- In Vit** Stuart, M. A., Meyer, N. A., and McClain, C. J. 1988. effects of yogurt on growth and zinc status of rats fed diets high in phytate and marginal in zinc. *Faseb Journal* 2: A868.
- CP** Stuart, M. A., Weaver, C. M., Ketelsen, S. M., and Erdman, J. W. Jr. bio availability of zinc-65 to rats from chicken and soy diets. 67TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, CHICAGO, ILL., USA, APRIL 10-15, 1983. *FED PROC.* 42 (3). 1983. Abstract 583.
- Nut def** Stuart, S. M., Ketelsen, S. M., Weaver, C. M., and Erdman, J. W. Jr. 1986. bioavailability of zinc to rats as affected by protein source and previous dietary intake. *Journal of Nutrition* 116(8): 1423-31.
- Surv** Stublely, D., Campbell, C., Dant, C., Blackmore, D. J., and Pierce, A. 1983. copper and zinc levels in the blood of thoroughbreds in training in the united kingdom. *Equine Veterinary Journal* 15(3): 253-256.
- Diss** Stuedemann, J. A. 1971. the metabolism of calcium, phosphorus, magnesium, copper, zinc and potassium in lambs as related to dietary calcium level. *Dissertation Abstracts International* 31B(10): 5734.
- Unrel** Stull, R. E. and Russell, J. D. zinc concentrations in ethanol liquid diet formulations. *Drug Alcohol Depend. (1981)* 7(4): 393-4.
- Unrel** Stultz, T. W., Vidimos, A. T., Bailin, P. L., and Rossi, E. P. 1993. mohs fixed-tissue excision of dentoalveolar bone in canines: a histologic evaluation. *Journal of Oral and Maxillofacial Surgery* 51(1): 39-43; discussion 44.
- Anat** Sturman, J. A., Wen, G. Y., Wisniewski, H. M., and Hayes, K. C. 1981. histochemical

localization of zinc in the feline tapetum. effect of taurine depletion. *Histochemistry* 72(3): 341-50.

- Anat** Sturman, J. A., Wen, G. Y., Wisniewski, H. M., Niemann, W. H., and Hayes, K. C. taurine and tapetum structure. *Adv. Exp. Med. Biol.* (1982) 139(Taurine Nutr. Neurol.): 65-78, 1 plate .
- Nut def** Styruđ, Johan, Dahlstroem, V. Elisabeth, and Eriksson, Ulf J. induction of skeletal malformations in the offspring of rats fed a zinc deficient diet. *Upsala J. Med. Sci.* (1986) 91(1): 29-36
- IMM** Su Hua and Lau Yun-Fai Chris(A). 1992. demonstration of a stage-specific expression of the zfy protein in fetal mouse testis using anti-peptide antibodies. *Molecular Reproduction and Development* 33(3): 252-258.
- Gene** Su Lishan(A), Herschberger, R. Jane, and Weissman Irving L. 1993. lyar, a novel nucleolar protein with zinc finger dna-binding motifs, is involved in cell growth regulation. *Genes & Development* 7(5): 735-748.
- FL** Su, Qi, Duan, Yuqin, Liu, Jinxu, and Lu, Zhaohai. zinc contents in feeds for livestock and poultry in china. *Zhongguo Nongye Kexue (Beijing)* (1994) 27(2): 83-8
- Unrel** Suarez, F., Furne, J., Springfield, J., and Levitt, M. production and elimination of sulfur-containing gases in the rat colon. *Am. J. Physiol.* (1998) 274(4, Pt. 1): G727-G733 CODEN: AJPHAP; ISSN: 0002-9513.
- BioX** Subramanyam, Meena. 1990. effects of dietary protein and zinc restriction on the development of cellular immune responses in salmonella typhimurium infected mice. *Avail.: Univ. Microfilms Int. Order No. DA9029391 From: Diss. Abstr. Int. B 1990, 51. 6. 2810. 139 pp.*
- Bact** Succi, G., Sandrucci, A., Tamburini, A., Adami, A., and Cavazzoni, V. 1995. effects of using a new strain of bacillus coagulans as a probiotic on the performance of piglets. *Rivista Di Suinicoltura* 36(12): 59-63.
- FL** Suchy, P., Stanek, S. Vysoka Skola Zemedelska Brno Czechoslovakia, Jerabek, S., and Zelenka, J. 1989. dynamics in the blood picture and biochemical indicators of blood plasma in the breeder cocks during the period of sexual maturation. <original> dynamika zmen krevniho obrazu a biochemickych ukazatelu krevni plazmy u plemennych kohoutu v dobe pohlavniho dospivani. *Zivocisna Vyroba - UVTIZ. V. 34(8) P. 741-750*
- FL** Suchy, P., Strakova, E., Illek, J., and Simon, M. 1998. the effect of different types of zinc supplement on the development of gonads in pedigree cocks. *Czech Journal of Animal Science* 43(8): 343-348.
- FL** Suchy, Pavel, Strakova, E., Illek, Josef, and Simon, M. (1998). effect of various forms of zinc supplements on gonad development in breeding cocks. *Czech J. Anim. Sci.* 43(8): 343-348 .
- No COC** Sud, S. C. 1973. a note on the effect of insulin on lactation in rats. *Indian Journal of Animal Sciences* 43(1): 86-87.
- FL** Sudakova, N. M. effect of the trace element zinc on some indexes of lipid metabolism in experimental animals. *Uch. Zap. Petrozavodsk. Gos. Univ.* (1972) 19(7): 333-6
- Bio Acc** Sudhakar, L. S., Dhingra, L. D., and Sharma, D. N. 1984. zinc histochemistry of the buffalo accessory genital glands during postnatal development. *Indian Veterinary Journal* 61(11): 932-935.

- No COC** Sugahara, K., Kubo, T., and Hashimoto, Y. a purified diet for growing japanese quail. *BULL COLL AGRIC UTSUNOMIYA UNIV. Bulletin of the College of Agriculture Utsunomiya University.* 11 (1). 1980. 17-26.
- Rev** Sugarman, B. 1984. zinc and spinal cord injury: a review. *Journal of the American Paraplegia Society* 7(2): 39-42.
- Bact** Sugarman, B. and Agbor, P. 1987. the binding of chlamydia trachomatis and zinc to mccoys cells (mouse fibroblasts). *Infection* 15(1): 35-39.
- Nut def** Sugawara, G., Sugawara, N., Ikeda, N., Okawa, H., Okazaki, T., Otaki, J., Taguchi, K., Yokokawa, K., and Miyake, H. 1987. effects of ingested 4000 ppm aluminum on the essential metals, especially zinc, in intact and ethanol treated mice. *Drug and Chemical Toxicology* 10(3-4): 195-207.
- Nut** Sugawara, M., Suzuki, K., Endo, K., Tashiro, Y., Nakamura, K., Suzuki, K., Fujisawa, T., Shiragami, N., and Mitsuoka, T. 1992. effect of dietary fat and fiber on fecal flora, bacterial metabolites, and fecal properties in japanese volunteers. *Journal of Nutritional Science and Vitaminology* 38(4): 317-28.
- Unrel** Sugawara, N., Ikeda, T., Sugawara, C., Kohgo, Y., Kato, J., and Takeichi, N. 1992. regional distribution of copper, zinc and iron in the brain in long-evans cinnamon (lec) rats with a new mutation causing hereditary hepatitis. *Brain Research* 588(2): 287-90.
- Nut def** Sugawara, N., Sugawara, C., Li, D., Katakura, M., Miyake, H., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. effect of copper deficient diet on copper metabolism in long-evanscinnamon (lec) rat causing spontaneous hepatitis. 305-309.
- Drug** Sugawara, Naoki, Katakura, Michihiro, and Sugawara, Chieko. preventive effect of zinc compounds, polaprezinc and zinc acetate against the onset of hepatitis in long-evans cinnamon rat. *Res. Commun. Mol. Pathol. Pharmacol.* (1999) 103(2): 167-176.
- FL** SUGEIL', K. H. A, ZAKHARENKO, N. A., and MEL'NIKOVA, N. N. seasonal changes in the mineral composition of colostrum and milk serum of cows. *UKR BIOKHIM ZH;* 61 (1). 1989. 92-94.
- Chem Meth** Sugihara, H., Moriura, M., and Nikai, T. purification and properties of a lethal hemorrhagic protein mucro toxin a from the venom of the chinese habu snake trimeresurus-mucrosquamatus. *TOXICON. Toxicon.* 21 (2). 1983. 247-256.
- Org Met** Sugihara, R. T., Tobin, M. E., and Koehler, A. E. 1995. zinc phosphide baits and prebaiting for controlling rats in hawaiian sugarcane. *The Journal Of Wildlife Management.* 59(4): 882-889.
- Phys** Sugino Norihiro(A), Takiguchi Shuji, Kashida Shiro, Takayama Hisako, Yamagata Yoshiaki, Nakamura Yasuhiko, and Kato Hiroshi. 1999. suppression of intracellular superoxide dismutase activity by antisense oligonucleotides causes inhibition of progesterone production by rat luteal cells. *Biology of Reproduction* 61(4): 1133-1138.
- No COC** SUH, S. M. and FIREK, A. F. magnesium and zinc content and growth in offspring of alcoholic rats. *PEDIATR RES* 14:588,1980
- Nut def** Suh, S. M. and Firek, A. F. 1982. magnesium and zinc deficiency and growth retardation in offspring of alcoholic rats. *Journal of the American College of Nutrition* 1(2): 193-8.
- Alt** Suh, S. M. and Firek, A. F. 1980. magnesium (mg) and zinc (zn) content and growth in offspring

of alcoholic rats. *Pediatric Research* 14(4, II): 588.

- CP** Suh, S. W., Silva, D. S., Long, Y., and Frederickson, C. J. 1997. adrenalectomy-induced vesicular zinc depletion in the rat hippocampus. *Society for Neuroscience Abstracts* 23(1-2): 1493.
- Nut def** Suh, Se Mo and Firek, Anthony F. magnesium and zinc deficiency and growth retardation in offspring of alcoholic rats. *J. Am. Coll. Nutr.* (1982) 1(2): 193-8.
- Diss** Sujin Jaroonsak. 1981. improvement of plant protein broiler rations by supplementing with methionine, zinc bacitracin and terramycin considering cost and production performance of broilers as criteria. <original> kan prapprung ahan kaikrathong thi chai protein chak phut soem duai methionine zinc bacitracin lae terramycin doi phitcharana thung ton-thun lae samatthaphap kan phalit kaikrathong pen gen. 132 Leaves
- FL** Suk, Y. G. 1972. studies on effect of dietary zinc on tissue trace elements in the rat. *Korean Journal of Nutrition* 5(2): 91-103.
- Nut def** Suk, Young Gun. effect of dietary zinc on tissue trace elements in the rat. *Han'Guk Yongyanghak Hoeji* (1972) 5(2): 91-103.
- Nut def** Sukalski, K. A., LaBerge, T. P., and Johnson, W. T. 1997. in vivo oxidative modification of erythrocyte membrane proteins in copper deficiency. *Free Radical Biology & Medicine* 22(5): 835-42.
- FL** Sukhikh, N., Klabukova, L., Sorokina, N., and Tokar', V. 1979. premixes with various amounts of vitamin d. *Svinovodstvo, Moscow, USSR* (10): 27-28.
- FL** Suleimanov, R. A. setting hygienic standards for a nitrilotrimethylphosphonic-acid-zinc complexonate in reservoir water. *Gigiena i Sanitariya. 0* (11). 1984 (Recd. 1985). 73-74.
- Unrel** Suliman, S. M., Shumake, S. A., and Jackson, W. B. food preference in the nile rat arvicantis-niloticus. *TROP PEST MANAGE. Tropical Pest Management.* 30 (2). 1984. 151-158.
- Nut def** Sullivan, J. F., Burch, R. E., Quigley, H. J., and Magee, D. F. 1974. zinc deficiency and decreased pancreatic secretory response. *American Journal of Physiology* 227(1): 105-108.
- Abstract** SULLIVAN, J. F. and JETTON, M. M. 1979-1980. the effect in rats of diets deficient in zinc and zinc deficient plus ethanol. 52ND ANNUAL MEETING OF THE CENTRAL SOCIETY FOR CLINICAL RESEARCH
- Nut def** Sullivan, J. F., Jetton, M. M., Hahn, H. J. K., and Burch, R. E. enhanced lipid per oxidation in zinc deficient rats. *Clinical Research.* 26 (5). 1978 707a
- Nut def** Sullivan, J. F., Jetton, M. M., Hahn, H. K. J., and Burch, R. E. enhanced lipid peroxidation in liver microsomes of zinc-deficient rats. *American Journal Of Clinical Nutrition* Jan 1980. v. 33 (1) p. 51-56. ill., charts.
- Nut def** Sullivan, J. F., Williams, R. V., Wisecarver, J., Etzel, K., Jetton, M. M., and Magee, D. F. 1981. the zinc content of bile and pancreatic juice in zinc-deficient swine. *Proceedings of the Society for Experimental Biology and Medicine* 166(1): 39-43.
- In Vit** Sullivan, Vicki K., Burnett, Frank R., and Cousins, Robert J. metallothionein expression is increased in monocytes and erythrocytes of young men during zinc supplementation. *J. Nutr.* (1998) 128(4): 707-713.

- No Dose** Sumano, L. H., Ocampo, L., Zamora, M. A., and Navarro, J. Department of Pharmacology School of Veterinary Medicine National Autonomous University of Mexico UNAM Mexico City 04510 Mexico. 1998. effects of a zinc oxide-carbadox fibre premix on the performance of pigs in a herd affected with proliferative enteropathy. *Pig Journal*. V. 42 P. 24-32
- No COC** Sumati and Kapoor, A. C. effect of dietary iron levels on the bioavailability of iron, zinc and copper. *Indian J. Nutr. Diet.* (1986) 23(6): 165-70 .
- Unrel** Sumi, Y., Muraki, T., and Suzuki, T. 1982. histochemical staining of cadmium with benzothiazolylazonaphthol derivatives. *Histochemistry* 73(4): 481-6.
- Unrel** Sumi, Y., Muraki, T., and Suzuki, T. 1980. histochemical staining of cadmium with benzothiazolylazophenol derivatives. *Histochemistry* 68(3): 231-6.
- Drug** Summers, L. and Matz, L. R. 1976. extraction wound sockets. histological changes and paste packs--a trial. *British Dental Journal* 141(12): 377-9.
- FL** Sun, B. K. 1991. effects of fiber and vitamin food sources on mineral balance. *Korean Journal of Nutrition* 24(4): 326-336.
- Mineral** Sun Changchun (Hefei Municipal Company of Feed, Anhui China and Yang Feng. 1990. effects of dietary phytate phosphorus level on mineral metabolism of growing pigs. *Animal Husbandry and Veterinary Medicine.* (No. 5) P. 198-200
- Gene** Sun, J. M., Chen, H. Y., Litchfield, D. W., and Davie, J. R. 1996. developmental changes in transcription factors associated with the nuclear matrix of chicken erythrocytes. *Journal of Cellular Biochemistry* 62(4): 454-66.
- CP** Sun, L., Heerema, N., Crotty, L., Wu, X., Navara, C., Vassilev, A., Sensel, M., Reaman, G. H., and Uckun, F. M. 1999. expression of dominant-negative and mutant isoforms of the antileukemic transcription factor ikaros in infant acute lymphoblastic leukemia. Vol. 96, No. 02, Pp. 680-685 Proceedings Of The National Academy Of Sciences, Usa
- Phys** Sun, M. K. and Reis, D. J. 1994. dopamine or transmitter release from rat carotid body may not be essential to hypoxic chemoreception. *American Journal of Physiology* 267(6 Pt 2): R1632-9.
- Unrel** Sun, P., Shan, X. Q., Zheng, Y., Jin, L. Z., and Xu, W. B. 1991. determinations of dietary cadmium-induced metallothioneins in rabbit kidneys and cadmium in metallothioneins by anion-exchange high-performance liquid chromatography coupled with graphite furnace atomic absorption spectrometry. *Journal of Chromatography, Biomedical Applications* 572(1-2): 73-84.
- Phys** Sun, S. and Chasteen, N. D. 1992. ferroxidase kinetics of horse spleen apoferritin. *The Journal Of Biological Chemistry.* 267(35): 25160-25166.
- Nut def** Sundaresan, P. R., Cope, F. O., and Smith, J. C. Jr. 1977. influence of zinc deficiency on retinal reductase and oxidase activities in rat liver and testes. *Journal of Nutrition* 107(12): 2189-97.
- Nut def** Sundaresan, P. R., Cope, F. O., and Smith, J. C. Jr. influence of zinc deficiency on retinal reductase ec-1.1.1.1 and retinal oxidase ec-1.2.1.3 activities in rat liver and testes. *Journal of Nutrition.* 107 (12). 1977 2189-2197.
- CP** Sundaresan, P. R., Kaup, S. M., Wiesenfeld, P. W., and Rader, J. I. interactions among dietary vitamin a zinc and copper in female sprague-dawley rats i. effects of vitamin a. 1992 MEETING

OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY
(FASEB), PART II, ANAHEIM, CALIFORNIA, USA, APRIL 5-9, 1992. FASEB (FED AM SOC
EXP BIOL) J. 6 (5). 1992. A1784.

- Drug** Sundaresan, P. R., Kaup, Susan M., Wiesenfeld, Paddy W., Chirtel, Stuart J., Hight, Susan C., and Rader, Jeanne I. interactions in indices of vitamin a, zinc and copper status when these nutrients are fed to rats at adequate and increased levels. *Br. J. Nutr.* (1996) 75(6): 915-928 CODEN: BJNUAV; ISSN: 0007-1145.
- Nut def** Sundaresan, P. Ramnathan, Cope, Frederick O., and Smith, J. Cecil Jr. influence of zinc deficiency on retinal reductase and oxidase activities in rat liver and testes. *J. Nutr.* (1977) 107(12): 2189-97.
- An Prod** Sunde, M. L. 1972. zinc requirement for normal feathering of commercial leghorn-type pullets. *Poult. Sci.* 51(4): 1316-22 .
- In Vit** Supakar, P. C. and Kanungo, M. S. conformational changes in the chromatin of the brain of developing rats and its modulation by zinc chloride. *Mol. Biol. Rep.* (1984) 9(4): 253-7 .
- Unrel** Supek, F., Supekova, L., Nelson, H., and Nelson, N. 1997. function of metal-ion homeostasis in the cell division cycle, mitochondrial protein processing, sensitivity to mycobacterial infection and brain function. *Journal of Experimental Biology* 200(Pt 2): 321-30.
- Nut def** Supplee, W. C. 1961. production of zinc deficiency in turkey poults by dietary cadmium. *Poult.Sci.* 40: 827-828.
- No Dose** Surai, Peter F., Speake, Brian K., Noble, Raymond C., and Sparks, Nick H. C. tissue-specific antioxidant profiles and susceptibility to lipid peroxidation of the newly hatched chick. *Biol. Trace Elem. Res.* (1999) 68(1): 63-78.
- FL** Surdzhiiska, S., Lalov, N., and Marinov, B. 1978. some antibiotics as supplements in feeds for broiler chickens. *Zhivotnov'Dni Nauki* 15(1): 64-70.
- FL** Surdzhiiska, S., Lalov, N., and Marinov, B. results from the use of some antibiotics as feed supplements for broiler chickens. *Zhivotnov'Dni Nauki.* 15 (1). 1978 64-70
- FL** Surina, S. M. and Tabakov, N. A. 1989. the effect of balanced feed rations on milk yield, reproduction and metabolism in cows. <document title>intensifikatsiya zhivotnovodstva v khakassii. 61-63.
- Nut** Susaki, H., Matsui, T., Ashida, K. Y., Fujita, S., Nakajima, T., and Yano, H. 1999. availability of a zinc amino acid chelate for growing pigs. *Animal Science Journal* 70(3): 124-128.
- Acu** Suso, F. A. and Edwards, H. M. Jr. 1972. binding of edta, histidine and acetylsalicylic acid to zinc-protein complex in intestinal content, intestinal mucosa and blood plasma. *Nature* 236(No.5344): 230-232.
- CP** Suso, F. A. and Edwards, H. M. Jr. ethylenediaminetetraacetic acid and zinc-65 binding by intestinal digesta, intestinal mucosa, and blood plasma. *Proc. Soc. Exp. Biol. Med.* (1971) 138(1): 157-62.
- Bio Acc** Suso, F. A. and Edwards, H. M. Jr. 1969. whole body counter studies on the absorption of ⁶⁰co, ⁵⁹fe, ⁵⁴mn and ⁶⁵zn by chicks, as affected by their dietary levels and other supplemental divalent elements. *Poultry Science* 48(3): 933-8.

- Bio Acc** Suso, Francisco A. and Edwards, Hardy M. Jr. 1968. influence of various chelating agents on absorption of cobalt-60, iron-59, manganese-54, and zinc-65 by chickens. *Poultry Sci.* 47(5): 1417-25 .
- Nut def** Sutomo, F. X., Woutersen, R. A., and Van den Hamer, C. J. A. effects of elevated zinc intake on the copper metabolism and the pancreas of the mouse. *J. Trace Elem. Electrolytes Health Dis.* (1992) 6(2): 75-80.
- CP** Suttle, N. F. factors affecting the trace element requirements of ruminants. *AGRICULTURE GROUP SYMPOSIUM ON TRACE ELEMENTS IN SOILS, PLANTS AND ANIMALS, LONDON, ENGLAND, MAR. 20, 1979. J FOOD SCI AGRIC.* 30 (7). 1979. 743-744.
- No Oral** Suttle, N. F., Davies, H. L., and Field, A. C. 1982. a model for zinc metabolism in sheep given a diet of hay. *British Journal of Nutrition* 47(1): 105-112.
- FL** Suveges, T., Nagy, Gy., and Meszaros, J. 1974. high incidence of parakeratosis in pigs on large farms. *Magyar Allatorvosok Lapja* 29(9): 577-581.
- Nut def** Suwarnasarn, A., Low, F. N., Lykken, G. I., Wallwork, J. C., and Sandstead, H. H. zinc deficiency and epiphyseal growth in the weanling rat (skeletal abnormalities). *Proceedings Of The North Dakota Academy Of Science.* Apr 1981. v. 35 p. 40.
- Nut def** Suwarnasarn, A., Wallwork, J. C., Lykken, G. I., Low, F. N., and Sandstead, H. H. epiphyseal plate development in the zinc-deficient rat (bone formation). *The Journal Of Nutrition.* July 1982. v. 112 (7) p. 1320-1328. ill.
- Nut def** Suwarnasarn, Aruni, Wallwork, J. C., Lykken, G. I., Low, F. N., and Sandstead, H. H. epiphyseal plate development in the zinc-deficient rat. *J. Nutr.* (1982) 112(7): 1320-8.
- No Oral** Suzuki, C. A. and Cherian, M. G. 1989. renal glutathione depletion and nephrotoxicity of cadmium-metallothionein in rats. *Toxicology and Applied Pharmacology* 98(3): 544-52.
- FL** Suzuki, K. effect of zinc carnosine on liver regeneration in rats with partial hepatectomy. *Nichidai Igaku Zasshi.* 49 (2). 1990. 157-168.
- FL** Suzuki, K., Kanke, Y., and Goto, S. 1980. <translated> effect of iron-deficiency on iron, copper and zinc concentration in rat tissues. *Eiyo To Shokuryo.* = ; *Journal Of Japanese Society Of Food And Nutrition.* 33 (4): 253-258.
- No Oral** Suzuki, K. T. 1984. studies of cadmium uptake and metabolism by the kidney. *Environmental Health Perspectives* 54: 21-30.
- Unrel** Suzuki, K. T., Kanno, S., Misawa, S., and Sumi, Y. 1993. changes in hepatic copper distribution leading to hepatitis in lec rats. *Research Communications in Chemical Pathology and Pharmacology* 82(2)
- Phys** Suzuki, K. T., Takenaka, J., and Ogra, Y. identification of the zinc-binding protein specifically present in male rat liver as carbonic anhydrase iii. *Chem.-Biol. Interact.* (1999) 122(3): 185-197.
- No Oral** SUZUKI, K. T., TAMAGAWA, H., TAKAHASHI, K., and SHIMOJO, N. pregnancy-induced mobilization of copper and zinc bound to renal metallothionein in cadmium-loaded rats. *TOXICOLOGY*; 60 (3). 1990. 199-210.
- FL** Suzuki, Kazuharu, Kanke, Yusuke, and Goto, Shiro. effect of iron-deficiency on iron, copper and

zinc concentrations in rat tissues. *Eiyo to Shokuryo* (1980) 33(4): 253-8 CODEN: EISOAU; ISSN: 0021-5376.

- FL** Suzuki, Kazuharu, Uehara, Mariko, Endo, Yukie, and Goto, Shiro. 1986. effect of lactose, lactulose and sorbitol on iron, zinc and copper utilization in rats. *Nippon Eiyo Shokuryo Gakkaishi* 39(3): 217-19 .
- No Tox** Suzuki, Kazuo T., Ebihara, Yoshiyuki, Akitomi, Hiroyuki, Nishikawa, Masataka, and Kawamura, Ryoko. change in ratio of the two hepatic isometallothioneins with development from prenatal to neonatal rats. *Comp. Biochem. Physiol. C* (1983) 76C(1): 33-8 .
- Alt** Suzuki, Kazuo T., Kanno, Sanae, Misawa, Shogo, and Aoki, Yasunobu. copper metabolism leading to and following acute hepatitis in lec rats. *Toxicology* (1995) 97(1-3): 81-92 .
- In Vit** Suzuki, Kazuo T., Kanno, Sanae, Misawa, Shogo, and Sumi, Yawara. changes in copper distribution in the plasma and kidneys of lec rats following acute hepatitis. *Res. Commun. Chem. Pathol. Pharmacol.* (1993) 82(2): 225-32 .
- Bio Acc** Suzuki, Kazuo T. and Kobayashi, Etsuko. age-and sex-related changes in concentration of seven elements (ca, cu, fe, mg, p, s, and zn) in tissues and bodily fluids of rats . *Biomed. Res. Trace Elem.* (1994) 5(2): 101-11.
- No Oral** Suzuki, Kazuo T., Yamamoto, Kyoko, Kanno, Sanae, Aoki, Yasunobu, and Takeichi, Noritoshi. selective removal of copper bound to metallothionein in the liver of lec rats by tetrathiomolybdate. *Toxicology* (1993) 83(1-3): 149-58.
- Nut def** Suzuki, Keiko, Suzuki, Kazutomo, Hara, Noriko, Arakawa, Yasuyuki, Matsuo, Yutaka, Kimoto, Ichiro, Sasaki, Tomoaki, and Takeuchi, Shigeo. effect of carnosine-zinc on liver regeneration in rats with partial hepatectomy. *Biomed. Res. Trace Elem.* (1990) 1(1): 35-9 CODEN: BRTEE5; ISSN: 0916-717X.
- CP** SUZUKI, S., OGAWA, Y., KMATA, E., KANAKO, T., and KUROKAWA, Y. 1990. study on essential metal concentration in the organs of rats. *SEVENTEENTH ANNUAL MEETING OF THE JAPANESE SOCIETY OF TOXICOLOGICAL SCIENCES*
- FL** Svec, R., Mateova, Z., Kaldy, A., and Koci, S. growth effect of zinc, manganese, and copper additives in feed for goslings. *Krmivarstvi Sluzby* (1978) 14(5): 111-12.
- CP** Svensson Eric C, Tufts Rachel L, Polk Chris E, and Leiden Jeffrey M. 1998. identification and characterization of cardiac friend of gata (cfog), a novel fog-related protein expressed during early cardiac and brain development. *Circulation* 98(17 SUPPL.): I757.
- FL** Svezhentsov, A., Tukuser, R., and Sapunkov, S. 1992. vitakorm for broilers. *Ptitsevodstvo* (7): 18-20.
- FL** Svezhentsov, A. I. mineral composition of milk when feeding cows diets with trace elements. *DOKL VSES ORDENA LENINA ORDENA TRUD KRASNOGO ZNAMENI AKAD S-KH NAUK IM V I LENINA. Doklady Vsesoyuznoi Ordena Lenina i Ordena Trudovogo Krasnogo Znameni Akademii Sel'Skokhozyaistvennykh Nauk Imeni V I Lenina.* 0 (2). 1980. 27-29.
- FL** Svezhentsov, A. I. 1986. synergism between microbial carotene and trace elements in pig feeding. *Svinarstvo, Kiev, Ukrainian SSR* (42): 50-55.
- FL** Svezhentsov, A. I., Nesterenko, V. V., and Belousov, A. A. 1989. ensiled high-lysine maize in diets for young pigs. *Zootekhnika* (2): 47-50.

- In Vit** Swann, John C., Reynolds, John J., and Galloway, W. Alan. zinc metalloenzyme properties of active and latent collagenase from rabbit bone. *Biochem. J.* (1981) 195(1): 41-9 .
- HHE** Swanson, C. A. and King, J. C. 1987. zinc and pregnancy outcome. *American Journal Of Clinical Nutrition* 46(5): 763-771.
- No Org** Swanson, R., Ilsley, W. H., and Stanislawski, A. G. 1983. crystal-structure of zinc citrate. *Journal Of Inorganic Biochemistry* 18(3): 187-194.
- In Vit** Swanson, R. A. and Sharp, F. R. 1992. zinc toxicity and induction of the 72 kd heat shock protein in primary astrocyte culture. *Glia* 6(3): 198-205.
- No Tox** Swedin, G. and Lindholmer, C. 1974. permanent infertility of the male rat after denervation of the vas deferens and the accessory genital glands. *Andrologia* 6(2): 103-10.
- Nut def** Swenerton, H. and Hurley, L. S. 1968. severe zinc deficiency in male and female rats. *Journal of Nutrition* 95(1): 8-18.
- Prim** Swenerton, H. and Hurley, L. S. zinc deficiency in the bonnet monkey macaca-radiata. *FED PROC. Federation Proceedings*. 31 (2). 1972 667
- Nut def** Swenerton, H., Shrader, R., and Hurley, L. S. 1972. lactic and malic dehydrogenases in testes of zinc-deficient rats. *Proceedings of the Society for Experimental Biology and Medicine*; 141
- Nut def** Swenerton, Helene and Hurley, Lucille S. severe zinc deficiency in male and female rats. *J. Nutr.* (1968) 95(1): 8-18 CODEN: JONUAI.
- Mix** Swenerton, Helene and Hurley, Lucille S. teratogenic effects of a chelating agent and their prevention by zinc. *Science* (1971) 173(3991): 62-4 .
- Prim** Swenerton, Helene and Hurley, Lucille S. zinc deficiency in rhesus and bonnet monkeys including effects on reproduction. *J. Nutr.* (1980) 110(3): 575-83 CODEN: JONUAI; ISSN: 0022-3166.
- Nut def** Swenerton, Helene, Shrader, Ruth, and Hurley, Lucille S. lactic and malic dehydrogenase in testes of zinc-deficient rats. *Proc. Soc. Exp. Biol. Med.* (1972) 141(1): 283-6 CODEN: PSEBAA.
- Abstract** Swenson, C. K., Ansotegui, R. P., Swensson, E. J., Paterson, J. A., and Johnson, A. B. 1996. influence of mineral supplementation on immunity, retention and reproduction in first-calf beef heifers. *Journal of Animal Science* 74(SUPPL. 1): 262.
- Abstract** Swenson, C. K(A), Ansotegui, R. P(A), Swensson, E. J(A), Paterson, J. A(A), and Johnson, A. B. 1998. trace mineral supplementation effects on first-calf beef heifer reproduction, milk production and calf performance. *Journal of Dairy Science* 81(SUPPL. 1): 360.
- BioX** Swenson, J. J., Trowbridge, P. W., and Frisque, R. J. 1996. replication activity of jc virus large t antigen phosphorylation and zinc finger domain mutants. *Vol. 2, No. 2, Pp. 78-86 J. Neurovirol.*
- No Oral** Swerdel, Mavis R. and Cousins, Robert J. induction of kidney metallothionein and metallothionein messenger rna by zinc and cadmium. *J. Nutr.* (1982) 112(4): 801-9 .
- BioX** Swick, R. A., Cheeke, P. R., and Buhler, D. R. 1982. subcellular distribution of hepatic copper, zinc and iron and serum ceruloplasmin in rats intoxicated by oral pyrrolizidine (senecio) alkaloids. *J. Anim. Sci.* 55(6): 1425-30 .

- Bio Acc** Swiergosz, R., Sawicka-Kapusta, K., Nyholm, N. Ei, Zwolinska, A., and Orkisz, A. 1998. effects of environmental metal pollution on breeding populations of pied and collared flycatchers in niepolomice forest, southern poland. *Environmental Pollution* . 102(2-3): 213-220.
- FL** Swinkels, J. W. G. M., Binnendijk, G. P., and Peet-Schwering, C. M. C. van der. 1995. post-weaning diarrhoea of pigs as affected by dietary levels of iron and zinc. <Document Title>Proefverslag - Proefstation Voor De Varkenshouderij (1.126): 19 pp.
- Abstract** Swinkels, J. W. G. M., Binnendijk, G. P., Van Der Peet-Schwering C M C, and Den Hartog L A. 1994. post-weaning diarrhoea, performance and blood hemoglobin levels of pigs as affected by dietary levels of iron and zinc. *Journal of Dairy Science* 77(SUPPL. 1): 331.
- Rev** Swinkels, J. W. G. M., Kornegay, E. T., and Verstegen, M. W. A. Department of Animal Science Virginia Polytechnic Institute and State University Blacksburg VA 24061 USA. 1994. biology of zinc and biological value of dietary organic zinc complexes and chelates. *Nutrition Research Reviews*. V. 7 P. 129-149
- Nut def** Swinkels, J. W. G. M., Kornegay, E. T., Zhou, W., Lindemann, M. D., Webb, K. E. Jr., and Verstegen, M. W. A. 1996. effectiveness of a zinc amino acid chelate and zinc sulfate in restoring serum and soft tissue zinc concentrations when fed to zinc-depleted pigs. *Journal of Animal Science* 74(10): 2420-2430.
- Mix** Sword, J. T., Ataja, A. M., Pope, A. L., and Hoekstra, W. G. 1984. effect of calcium phosphates and zinc in salt-mineral mixtures on ad-libitum salt-mix intake and on zinc and selenium status of sheep. *Journal Of Animal Science* 59(6): 1594-1600.
- Rev** Syracuse Research Corporation.
- Surv** Szabo F(A), Zele, E., Polgar, J. P., and Wagenhoffer Zs. 1999. study on peat bog soil pastures for sustainable development of beef cattle farming. *Livestock Production Science* 61(2-3): 253-260.
- Alt** SZALAY, J. and GAAL, M. clinical and morphological studies in streptozotocin diabetic pregnant rats. *ACTA MED ACAD SCI HUNG* 32:35-41,1975
- No Tox** Szczurek, E. M., Jackson, S. G., Rooney, J. R., and Baker, J. P. 1988. influence of confinement, plane of nutrition and low heel on the occurrence of acquired, forelimb contracture in weanling horses. *Journal of Equine Veterinary Science* 8(5): 386-391.
- Nut** Szelenyi Galanta, Marianne, Votisky, Laszlo Mrs., Dinnyes, Laszlo Mrs., and Jecsai, Gyorgy Mrs. effect of iodine, copper, and zinc supplementation on availability of rape seed meal of high glucosinolate content in monogastric animals. *Allattenyesz. Takarmanyozas (1990)* 39(4): 369-76.
- No COC** Szelenyi, Istvan and Brune, Kay. possible role of oxygen free radicals in ethanol-induced gastric mucosal damage in rats. *Dig. Dis. Sci. (1988)* 33(7): 865-71 .
- Dead** Szeleszczuk, P., Borzemska, W., and Gozlinski, H. 1989. cation content of the fetal fluids of dead chick embryos from hens naturally infected with adenoviruses. *Medycyna Weterynaryjna* 45(9-10): 535-537.
- FL** Szeleszczuk, P., Borzemska, W., and Gozlinski, H. Szkoła Główna Gospodarstwa Wiejskiego Akademia Rolnicza Warszawa Poland Katedra Epizootiologii. 1989. concentration of cations in foetal fluids of dead chicken embryos originating from mothers naturally infected with adenoviruses. <original> zawartosc kationow w płynach płodowych zamarzłych zarodków kurzych

pochodzących od niosek naturalnie zakażonych adenowirusami. *Medycyna Weterynaryjna*. V. 45(9-10) P. 535-537

- Species** Szeleszczuk, P., Karpinska, E., Borzemska, W., and Samorek-Salamonowicz, E. the content of some cations in embryonic fluids of chick embryos experimentally infected with sublethal doses of celo virus. *MED WETER. Medycyna Weterynaryjna*. 46 (5). 1990. 137-139.
- FL** Szeleszczuk, P., Karpinska, E., Borzemska, W., and Samorek-Salamonowicz, E. Szkoła Główna Gospodarstwa Wiejskiego Akademia Rolnicza Warszawa Poland Zakład Chorob Drobiu. 1990. concentration of some cations in embryonic fluids of chicken embryos infected experimentally with sublethal doses of celo virus. <original> zawartosc wybranych kationow w płynach płodowych zarodników kurzych eksperymentalnie zakażonych subletalnymi dawkami wirusa celo. *Medycyna Weterynaryjna*. V. 46(5) P. 137-135
- Nut def** Szerdahelyi, P., Kozma, M., and Ferke, A. zinc deficiency induced trace element concentration and localization changes in the central nervous system of albino rat during post natal development 2. atomic absorption spectrophotometric examinations. *Acta Histochemica*. 70 (2). 1982. 173-182.
- Nut def** Szerdahelyi, P., Kozma, M., and Ferke, A. 1982. zinc deficiency-induced trace element concentration and localization changes in the central nervous system of albino rat during postnatal development. ii. atomic absorption spectrophotometric examinations. *Acta Histochemica* 70(2): 173-82.
- Nut def** Szerdahelyi, Peter, Kozma, Marta, and Ferke, Andras. zinc deficiency-induced trace element concentration and localization changes in the central nervous system of albino rat during postnatal development . ii. atomic absorption spectrophotometric examinations. *Acta Histochem*. (1982) 70(2): 173-82.
- FL** Szilagyi, M., Sandor, S., and Kovacs, A. the effect of calcium and phosphorus supplementation on the mineral content of the hoof. *Allattenyesztes Es Takarmanyozas*. 31 (1). 1982. 49-51.
- Plant** Szponar, Lucjan, Mieleszko, Teresa, Siuta, Jan, and Rzeszowska, Grazyna. 1983. nutritional value of potatoes contaminated by lead, cadmium and zinc. *Arch. Ochr. Srodowiska* (3-4): 179-86 .
- FL** Szwabowicz, A. and Kotowski, K. 1971. (experimental treatment of bovine ringworm with a zinc oxidesupplemented diet.). *Medycyna Weterynaryjna* 27(5): 267-268.
- Fate** SZYMANSKA, J. A., BEM, E. M., PIOTROWSKI, J. K., BRZEZNICKI, S., and BARAN, T. 1989. renal binding of cadmium in the rat following intragastric exposure. *TOXICOLOGY*. 55 (3): 339-348.
- Unrel** Szymanska, J. A., Chmielnicka, J., Kaluzynski, A., and Papierz, W. 1993. influence of bismuth on the metabolism of endogenous metals in rats. *Biomedical and Environmental Sciences* 6(2): 134-44.
- BioAcc** Szymkiewicz, Maria M., Niemiec, Jan, and Stepinska, Malgorzata. 1990. determination of the relation between the contents of magnesium, zinc, copper, iron and manganese in blood and feathers of rhode island red hens and the results of hatchability. *Ann. Warsaw Agric. Univ. SGGW-AR Anim. Sci.* (25): 9-14.
- Org Met** Szyszkowska, Agnieszka, Pres, Jerzy, Jamroz, Dorota, and Wartecki, Tomasz. 1998. effect of zn-bacitracin, salinomycin, monensin, and avoparcin on the growth and nutrient availability in calves. *Prace i Materialy Zootechniczne* 0(52): 97-104.

- Ecol** Tabaka Christopher S(A), Ullrey Duane E, Sikarskie James G(A), Debar Sharon R, and Ku Pao K. 1996. diet, cast composition, and energy and nutrient intake of red-tailed hawks (*buteo jamaicensis*), great horned owls (*bubo virginianus*), and turkey vultures (*cathartes aura*). *Journal of Zoo and Wildlife Medicine* 27(2): 187-196.
- IMM** Tabatabai, L. B. and Hennager, S. G. 1994. cattle serologically positive for brucella abortus have antibodies to Cu-Zn superoxide dismutase. *Clinical and Diagnostic Laboratory Immunology* 1(5): 506-510.
- CP** Tabuchi, R. and Ohara, I. 1995. the relationships between dietary protein levels and minerals affecting taste sensitivity for sodium chloride in rats. *FASEB Journal* 9(4): A737.
- Nut** Tabuchi, Ritsuko, Econ, M. Home, and Ohara, Ikuo. influence of zinc supplementation to diets at graded levels of protein on taste sensitivity, morphological changes of tongue epithelia and serum zinc concentration in growing rats. *J. Am. Coll. Nutr.* (1996) 15(3): 303-308.
- No Dose** Tabuchi, Ritsuko, Econ, M. Home, Ohara, Ikuo, and Agr, D. the timing of protein feeding and dietary protein levels affect taste preference, serum zinc concentration and glossal epithelial morphology in growing rats. *J. Am. Coll. Nutr.* (1998) 17(1): 79-85
- Unrel** Tabuchi, Ritsuko and Ohara, Ikuo. optimal protein level is required for normalization of taste sensitivity in rats. *Nutr. Res. (N. Y.)* (1997) 17(11/12): 1749-1760.
- Drug** Tadaoka, T., Iwasaki, Y., Tomono, K., Gotoh, H., and Inose, H. 1984. comparison of boric acid and zinc oxide ointments with different bases in the treatment of wounds. *J. Nippon Hosp. Pharm. Assoc.* 5 ISS Aug 1979
- FL** Tadzhiyev, F. S., Danilov, L. N., Lebedeva, E. S., Panichev, N. A., and Sou, M. 1992. [content of trace elements and steroid hormones in blood and tissues of internal organs in experimental pulmonary fibrosis induced by intratracheal administration of bleomycin]. <original> *soderzhanie mikroelementov i steroidnykh gormonov v krovi i tkaniakh vnutrennikh organov pri ekperimental'nom fibroze legkikh, vyzvannom vnutritrakheal'nym vvedeniem bleomitsetina. Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya* (3): 5-7.
- No COC** Tahiliani, A. G., Lopaschuk, G. D., and McNeill, J. H. 1984. effect of insulin treatment on long-term diabetes-induced alteration of myocardial function. *General Pharmacology* 15(6): 545-7.
- FL** Tahmiscija, H. and Seremet, M. 1992. [histologic picture of dental pulp in dogs treated with ZnO paste]. <original> *histoloska slika zubne pulpe psa tretirane ZnO pastom. Medicinski Arhiv* 46(1-2): 13-4.
- FL** Tai, C., Liu, J. C., Hsu, N. S., Huang, T. W., and Lin, L. T. <translated> the effects of methods of forced molting on reproductive performance of ducks (zinc diets). *Hsu Ch'an Yen Chiu. ; Journal Of The Taiwan Livestock Research.* Dec 1979. v. 12 (2) p. 19-26. ill.
- Phys** Takagi Tsuyoshi, Moribe Hiroki, Kondoh Hisato, and Higashi Yujiro(A). 1998. deltaef1, a zinc finger and homeodomain transcription factor, is required for skeleton patterning in multiple lineages. *Development (Cambridge)* 125(1): 21-31.
- In Vit** Takahashi, H. and Koshi, K. 1981. solubility and cell toxicity of cobalt, zinc and lead. *Industrial Health* 19(1): 47-59.
- IMM** Takahashi, K., Onodera, K., and Akiba, Y. 1999. effect of dietary xylitol on growth and inflammatory responses in immune stimulated chickens. *British Poultry Science* 40(4): 552-4.

- No Tox** Takahashi, Kazuaki, Yodogawa, Shinichi, Akiba, Yukio, and Tamura, Keiji. effect of dietary protein concentration in responses to escherichia coli endotoxin in broiler chickens. *Br. J. Nutr.* (1995) 74(2): 173-82.
- No COC** Takahashi, O. and Hiraga, K. effects of dietary butylated hydroxy toluene on functional and biochemical properties of platelets and plasma preceding the occurrence of hemorrhage in rats. *Food and Chemical Toxicology.* 22 (2). 1984. 97-104.
- No COC** Takahashi, O. and Hiraga, K. 1984. effects of dietary butylated hydroxytoluene on functional and biochemical properties of platelets and plasma preceding the occurrence of haemorrhage in rats. *Food and Chemical Toxicology* 22(2): 97-103.
- Fate** Takahashi, T., Paliwal, V. K., and Ebadi, M. 1988. subcellular-distribution of zinc and the presence of a metallothionein-like protein in bovine retina. *Neurochemistry International* 13(4): 525-530.
- Phys** Takamasu, M., Fuse, Y., Kawamoto, K., Ohara, T., and Kodama, T. possible mechanisms of diethyldithiocarbamate-induced duodenal mucosal damage in rats. *Japanese Journal of Gastroenterology.* 86 (9). 1989. 2189-2195.
- FL** Takamori, Y. 1986. [pulp response to a posterior composite resin restoration with enamel etching or with enamel and dentin etching]. *Shika Gakuho* 86(2): 115-71.
- Phys** Takata Ikuya, Kawamura Naohisa, Myint Theingi, Miyazawa Nobuko, Suzuki Keiichiro, Maruyama Naoki, Mino Makoto, and Taniguchi Naoyuki(A). 1996. glycated cu,zn-superoxide dismutase in rat lenses: evidence for the presence of fragmentation in vivo. *Biochemical and Biophysical Research Communications* 219(1): 243-248.
- Fate** Takeda, A., Tamano, H., Ohnuma, M., and Okada, S. 1995. 65zn uptake by liver of rats fed 3'-methyl-dimethylaminoazobenzene. *Nuclear Medicine and Biology* 22(3): 351-3.
- No Oral** Takeda A(A), Takefuta S(A), Sawashita S(A), Okada S(A), and Oku N(A). 1999. role of brain vesicular zinc on learning and memory of rats. *Society for Neuroscience Abstracts* 25(1-2): 86.
- Carcin** Takeda, Atsushi, Sato, Tetsu, Tamano, Haruna, and Okada, Shoji. elevation of hepatic levels of metallothionein and zinc in mice bearing experimental tumors. *Biochem. Biophys. Res. Commun.* (1992) 189(2): 645-9 .
- Phys** Takeda, Atsushi, Sawashita, Jinko, Takefuta, Sachiyo, Ohnuma, Miho, and Okada, Shoji. role of zinc released by stimulation in rat amygdala. *J. Neurosci. Res.* (1999) 57(3): 405-410.
- Nut def** Takeda, Atsushi, Takefuta, Sachiyo, Okada, Shoji, and Oku, Naoto. relationship between brain zinc and transient learning impairment of adult rats fed zinc-deficient diet. *Brain Res.* (2000) 859(2): 352-357.
- Carcin** Takeda, Atsushi, Tamano, Haruna, and Okada, Shoji. differential induction of hepatic metallothionein in tumor-bearing mice and its application for tumor detection. *Biomed. Res. Trace Elem.* (1993) 4(2): 155-6.
- Drug** Takeda Satoshi(A), Yoshikawa Toshikazu, Morita Yutaka, Yoshida Norimasa, and Kondo Motoharu. 1999. effect of zinc on experimental acute pancreatitis in rats. *Journal of Clinical Biochemistry and Nutrition* 26(3): 213-225.
- FL** Takenaka, T. an experimental study on correlation between serum zinc and zinc contents of red blood cells. *Nippon Geka Gakkai Zasshi* (1981) 82(5): 429-34 .

- Nut def** Takenaka, Takumi. correlation between serum zinc contents of red blood cells. *Jutsugo Taisha Kenkyu Kaishi* (1981) 15(3): 306-13 .
- CP** Takeshi, M., Okazaki, Y., and Fushimi, H. accumulation of calcium in the kidneys of streptozotocin-diabetic rats on a low zinc diet. 42ND NATIONAL MEETING OF THE AMERICAN ASSOCIATION FOR CLINICAL CHEMISTRY AND THE 34TH ANNUAL MEETING OF THE CANADIAN SOCIETY OF CLINICAL CHEMISTS HELD AT THE XIV INTERNATIONAL CONGRESS OF CLINICAL CHEMISTRY, SAN FRANCISCO, CALIFORNIA, USA, JULY 22-26, 1990. *CLIN CHEM.* 36 (6). 1990. 1172.
- Phys** Taketo, M. and Yoshioka, T. developmental change of gabaa receptor-mediated current in rat hippocampus. *Neuroscience (Oxford)* (2000) 96(3): 507-514
- No Oral** Takeuchi, Fumiko and Isawa, Aiko. changes of organ copper and zinc after injection of metal in mice administered d-penicillamine containing drinking water and alkaline water. *Tokyo Joshi Ika Daigaku Zasshi* (1981) 51(3): 224-30.
- FL** Takeuchi, Fumiko and Iwasa, Aiko. lethal dosis of copper and zinc in the rabbit. *Tokyo Joshi Ika Daigaku Zasshi* (1976) 46(7): 527-9.
- Nut def** Takeuchi, S., Kimoto, I., Mano, M., Tomioka, E., Nakajima, Y., Kasima, Y., Ishikawa, H., Arakawa, Y., and Sasaki, T. metabolism of metals (particularly zinc) in ods rats. *Biomed. Res. Trace Elem.* (1992) 3(2): 167-8.
- No Oral** Takeuchi, S., Mano, M., Usui, M., Sugimura, T., Kimoto, I., Arakawa, Y., Uchida, Y., and Kubodera, A. influence of low-zn diet on liver cirrhosis in rats. *Biomed. Res. Trace Elem.* (1993) 4(2): 173-4
- Mix** Taki, Hiroyuki and Niwa, Motoo. effects of dietary lead and zinc on lead concentration in hard tissues in rats. *Koku Eisei Gakkai Zasshi* (1986) 36(1): 87-95.
- Drug** Takiguchi, M., Dhar, S. K., Kitajima, S., Arizono, K., and Ariyoshi, T. effects on the activities of drug metabolizing enzymes and on cytochrome p450 3a isoenzyme in the liver of rats fed on different levels of iron-deficient diet. *Trace Elem. Electrolytes* (1996) 13(2): 79-84.
- Rev** Takikawa, S., Suzuki, K., Yoshida, T., Yamazaki, K., Sato, S., Itai, K., Tsunoda, H., Takeichi, N., and Kobayashi, H. copper and zinc metabolism in lec (long-evans cinnamon) rats with hereditary hepatitis. *Biomed. Res. Trace Elem.* (1991) 2(2): 179-80 .
- Nut** Takruri, H. R. H. and Dameh, M. A. F. 1998. study of the nutritional value of black cumin seeds (nigella sativa l). *Journal Of The Science Of Food And Agriculture.* 76(3): 404-410.
- Nut** Talpada, P. M. and Shukla, P. C. 1988. effect of feeding prosopis juliflora pods on certain blood constituentsof lactating cows. *Gujvet* 16(1): 32-35.
- In Vit** Talukder, G. and Harrison, N. L. 1995. on the mechanism of modulation of transient outward current in cultured rat hippocampal neurons by di- and trivalent cations. *Journal of Neurophysiology* 73(1): 73-9.
- CP** Tamada, H., Nezu, R., Matsuo, Y., Takagi, Y., and Okada, A. effect of dietary zinc on intestinal adaptation after massive small bowel resection mr in rats. 14TH CLINICAL CONGRESS PROGRAM OF THE AMERICAN SOCIETY FOR PARENTERAL AND ENTERAL NUTRITION, SAN ANTONIO, TEXAS, USA, JANUARY 28-31, 1990. *J PARENTER ENTERAL NUTR.* 14 (1 Suppl.). 1990. 9s.

- FL** Tamada, H., Nezu, R., Matsuo, Y., Takagi, Y., and Okada, A. zinc is essential for intestinal mucosa preservation in rats. *Biomed. Res. Trace Elem.* (1990) 1(2): 175-6.
- Nut def** Tamada, H., Nezu, R., Matsuo, Y., Takagi, Y., Okada, A., and Imamura, I. 1992. zinc-deficient diet impairs adaptive changes in the remaining intestine after massive small bowel resection in the rat. *British Journal of Surgery* 79(9): 959-63.
- Nut def** Tamakai, Nanaya, Fujimoto-Sakata, Shigeko, Kikugawa, Mariko, Kaneko, Masae, Onosaka, Satomi, and Takagi, Tatsuya. analysis of cyclic feed intake in rats fed on a zinc-deficient diet and the level of dihydropyrimidinase (ec 3.5.2.2). *Br. J. Nutr.* (1995) 73(5): 711-22.
- FL** Tamas, J. and Bokori, J. 1980. oesophageal gastric ulcers in swine. ii. role of zinc supplements in the aetiology of the disease. *Magyar Allatorvosok Lapja* 35(7): 435-438.
- No Oral** Tamayo, Fernando Garcia, Valdes, Luis I. Terrazas, and Lopez, Nachelli Malpica. zinc administration prevents wasting in stressed mice. *Arch. Med. Res.* (1996) 27(3): 319-325
- Bact** Tamura, K., Yamamura, M., Nishigami, T., Tonokatsu, Y., Yamamoto, I., Fukuda, Y., Satomi, M., and Shimoyama, T. 1994. effects of cytotoxic factors of helicobacter pylori on superoxide generation in situ in the rabbit stomach. *European Journal of Gastroenterology & Hepatology* 6 Suppl 1: S39-43.
- Nut def** Tamura, T., Kaiser, L. L., Watson, J. E., Halsted, C. H., Hurley, L. S., and Stokstad, E. L. R. 1987. increased methionine synthetase activity in zinc-deficient rat liver. *Archives Of Biochemistry And Biophysics.* 256(1): 311-316.
- Nut def** Tamura, Tsunenobu and Kaiser, Lucia L. the absorption of pteroylpolyglutamate and intestinal pteroylpolygammaglutamyl hydrolase activity in zinc-deficient rats. *J. Nutr.* (1991) 121(7): 1042-6.
- Nut def** Tamura, Tsunenobu, Kaiser, Lucia L., Watson, Joseph E., Halsted, Charles H., Hurley, Lucille S., and Stokstad, E. L. Robert. increased methionine synthetase activity in zinc-deficient rat liver. *Arch. Biochem. Biophys.* (1987) 256(1): 311-16.
- CP** Tamura Yukihiko, Tatematsu Masashi, Ohya Keiichi, and Ogura Hideaki. 1995. study on zinc-binding protein in liver of calcium-deficient rat. *Japanese Journal of Pharmacology* 67(SUPPL. 1): 242P.
- No Oral** TAN, B. KH, BAY, B. H., SIT, K. H., SIM, K. Y., and HSU, A. acute zinc administration prolongs hexobarbitone-induced sleeping time in c57/6j mice. *PHARMACOLOGICAL RESEARCH*; 32 (4). 1995. 233-236.
- Nut def** Tan Hedi (Fujian Agricultural Univ., Fuzhou China Dept. of Animal Science. 1995. report on the diagnosis and treatment of zinc deficiency in pigs. *Chinese Journal of Veterinary Medicine.* V. 21(3) P. 8-9
- Phys** Tan, N. H. and Saifuddin, M. N. isolation and characterization of a hemorrhagin from the venom of ophiophagus-hannah king cobra. *Toxicon.* 28 (4). 1990. 385-392.
- Chem Meth** Tanaka, Ayako and Teraki, Yoshimi. studies on the role of trace metals in biological systems. 2. colorimetric determination of zinc with 5nppf in liver, kidney and spleen of chicken. *Sei Marianna Ika Daigaku Zasshi* (1982) 10(3): 355-9.
- Drug** Tanaka, H. 1998. fetal alcohol syndrome: a japanese perspective. *Annals of Medicine* 30(1): 21-6.

- HHE** Tanaka, H. fetal alcohol syndrome in human and animal studies. *TWENTY-EIGHTH ANNUAL MEETING OF THE JAPANESE TERATOLOGY SOCIETY AND THE SECOND MEETING OF THE INTERNATIONAL FEDERATION OF TERATOLOGY SOCIETIES, KYOTO, JAPAN, JULY 14-16, 1988. TERATOLOGY. 38 (5). 1988. 549.*
- FL** Tanaka, H. 1997. [maternal environment and developmental brain damages]. *No to Hattatsu* 29(3): 183-9.
- HHE** TANAKA, H. and ARIMA, M. animal experiments as the models for human brain dysfunction: biochemical and pharmacokinetic studies. *TERATOLOGY* 32(3):18B,1985
- Drug** Tanaka, H. and Imai, S. congenital anomalies and tissue specificity of metals: triethylene tetramine dihydrochloride as a chelating drug of copper. *Teratology* 1995 Oct;52(4):13B
- Mix** TANAKA, H., INOMATA, K., and ARIMA, M. zinc supplementation in ethanol-treated pregnant rats increases the metabolic activity in the fetal hippocampus. *NO TO HATTATSU(BRAIN DEV)* 5:549-554,1983
- Abstract** Tanaka, H., Inomata, K., Nasu, F., Kasama, T., and Arima, M. abnormal movement in the heterozygotes of brindled mutant mice. *TWENTY-EIGHTH ANNUAL MEETING OF THE JAPANESE TERATOLOGY SOCIETY AND THE SECOND MEETING OF THE INTERNATIONAL FEDERATION OF TERATOLOGY SOCIETIES, KYOTO, JAPAN, JULY 14-16, 1988. TERATOLOGY. 38 (5). 1988. 528.*
- Unrel** Tanaka, H., Iwasaki, S., Nakazawa, K., and Inomata, K. fetal alcohol syndrome in rats conditions for improvement of ethanol effects of fetal cerebral development with supplementary agents. *Biology of the Neonate. 54 (6). 1988. 320-329.*
- Unrel** Tanaka, H., Iwasaki, S., Nakazawa, K., and Inomata, K. 1988. fetal alcohol syndrome in rats: conditions for improvement of ethanol effects on fetal cerebral development with supplementary agents. *Biology of the Neonate* 54(6): 320-9.
- Alt** Tanaka, H., Kasama, T., Inomata, K., and Nasu, F. 1990. abnormal movements in brindled mutant mouse heterozygotes: as related to the development of their offspring--biochemical and morphological studies. *Brain & Development* 12(3): 284-92.
- Unrel** Tanaka, H., Nakazawa, K., Suzuki, N., and Arima, M. 1982. prevention possibility for brain dysfunction in rat with the fetal alcohol syndrome--low-zinc-status and hypoglycemia. *Brain & Development* 4(6): 429-38.
- Drug** Tanaka, H., Nasu, F., and Inomata, K. 1991. fetal alcohol effects: decreased synaptic formations in the field ca3 of fetal hippocampus. *International Journal of Developmental Neuroscience* 9(5): 509-17.
- Unrel** Tanaka, Harumi, Iwasaki, Setsuo, Nakazawa, Kazuharu, and Inomata, Kenichirou. fetal alcohol syndrome in rats : conditions for improvement of ethanol effects on fetal cerebral development with supplementary agents. *Biol. Neonate (1988)* 54(6): 320-9.
- Nut def** Tanaka, Harumi, Yamanouchi, Masahiro, Imai, Shoji, and Hayashi, Yasuhisa. low copper and brain abnormalities in fetus from triethylenetetramine dihydrochloride-treated pregnant mouse. *J. Nutr. Sci. Vitaminol. (1992)* 38(6): 545-54.
- No COC** Tanaka, K., Horiguchi, K., Yoshida, T., Takeda, M., Fujisawa, H., Takeuchi, K., Umeda, M., Kato, S., Ihara, S., Nagata, S., and Fukui, Y. 1999. evidence that a phosphatidylinositol 3,4,5-trisphosphate-binding protein can function in nucleus. *Journal of Biological Chemistry* 274(7):

3919-22.

- Nut def** Tanaka, Masahiro, Yanagi, Masasi, Shirota, Kinji, Une, Yumi, Nomura, Yasuo, Masaoka, Toshio, and Akahori, Fumiaki. effect of cadmium in the zinc-deficient rat. *Vet. Hum. Toxicol.* (1995) 37(3): 203-8.
- FL** TANAKA, Y., TANAKA, R., and KASHIMOTO, T. effects of cysteine on the biological actions of cadmium in rats effects of cadmium on the fates of copper and zinc iv. studies on the fate of heavy metals in animals. *J FOOD HYG SOC JPN*; 26 (5). 1985. 411-422.
- FL** Tanatarov, A. manganese and zinc metabolism in ducklings. *Vestn. S-Kh. Nauki Kaz.* (1986) (5): 52-4 .
- FL** Tanatarov, A. B. relationship between manganese and zinc in hens under different content of trace elements in the diet. *S-Kh. Biol.* (1985) (11): 110-13.
- FL** Tanatarov, A. B. 1986. trace elements in duck feeding. *Zhivotnovodstvo*.(2): 44-45.
- FL** Tanatarov, M. A., Egorov, N. P., Tanatarov, A. B., Egeubaev, A. A., and Dabzhanova, S. T. effect of trace elements on productive qualities of muscovy ducks. *Vestn. S-Kh. Nauki Kaz.* (1994) (5): 64-72 .
- No COC** Tandon, Aparna, Nagpaul, J. P., Bandhu, H., Singh, Nirmal, and Dhawan, D. K. effect of lithium on hepatic and serum elemental status under different dietary protein regimens. *Biol. Trace Elem. Res.* (1999) 68(1): 51-62 .
- No COC** Tandon, L., Kasarskis, E. J., and Ehmann, W. D. inna for interelement correlations in rats after mercuric chloride exposure. *J. Radioanal. Nucl. Chem.* (1992) 161(1): 39-49 .
- Nut** Tandon, S. K. 1994. influence of methionine and zinc supplementation during chelation of lead. *Met. Ions Biol. Med. Proc. Int. Symp.*, 3rd : 31-6. Editor(s): Collery, Philippe. Publisher: Libbey, Montrouge, Fr.
- Nut def** Tandon, S. K. and Khandelwal, S. 1987. effect of zinc deficiency on the disposition of cadmium and essential metals in rats. *Indian Journal of Medical Research* 85(February): 202-205.
- Nut def** Tandon, S. K. and Khandelwal, Shashi. effect of zinc deficiency on the disposition of cadmium and essential metals in rats. *Indian J. Med. Res.* (1987) 85(Feb.): 202-5.
- Biom** Tandon, S. K. and Singh, S. 1994. protection of lead-induced toxicity by honey in rats. *International Journal of Pharmacognosy* 32(2): 149-153.
- Drug** Tandon, S. K., Singh, S., and Flora, S. J. S. influence of methionine and zinc supplementation during chelation of lead in rats. *J. Trace Elem. Electrolytes Health Dis.* (1994) 8(2): 75-7.
- No COC** Tandon, S. K. and Tewari, P. C. 1987. effect of co-exposure to ethanol and cadmium in rats. *Bulletin of Environmental Contamination and Toxicology* 39(4): 633-640.
- Nut def** Taneja, S. K. and Arya, P. influence of low dietary lipid content on anorexia and [¹⁴c]glucose uptake in the intestine of zinc-deficient mice. *Br. J. Nutr.* (1992) 68(2): 505-14, 1 plate.
- Nut def** Taneja, S. K., Chadha, S., and Arya, P. lipid-zinc interaction: its effect on the testes of mice. *Br. J. Nutr.* (1995) 73(5): 723-31.
- Nut def** Taneja, S. K., Kang, H., and Chopra, P. effect of testosterone propionate on cytochemical profile

of epididymis of zinc-deficient rats. *Indian Journal of Experimental Biology*. 24 (11). 1986. 676-678.

- Nut def** Taneja, S. K. and Kaur, B. lipids in mucosal epithelium of the intestine of mice fed on a zinc-deficient diet. *Curr. Sci.* (1988) 57(9): 493-4.
- Nut def** Taneja, S. K. and Kaur, B. 1988. lipids in mucosal epithelium of the intestine of mice fed on zn-deficient diet. *Current Science* 57(9): 493-494.
- Nut def** Taneja, S. K. and Kaur, R. 1988. effect of dietary zn-deficiency on the distribution of lipids in the ovary of mature mouse. *Indian Journal of Experimental Biology* 26(4): 271-3.
- Nut def** Taneja, S. K. and Kaur, R. 1990. pathology of ovary, uterus, vagina and gonadotrophs of female mice fed on zn-deficient diet. *Indian Journal of Experimental Biology* 28(11): 1058-65.
- Nut def** Taneja, S. K., Nath, A., and Bedi, U. 1987. pathology of pituitary-thyroid axis of the rats fed on zinc-deficient diet. *Res. Bull. Panjab Univ. Sci.* 38(1-2): 119-24
- Nut def** Taneja, S. K. and Nirmal. histopathology of testes of mice fed on zinc-deficient diet. *Indian J. Exp. Biol.* (1980) 18(12): 1411-14.
- Nut def** Taneja, Satish Kumar and Arya, Poonam. inanition may reduce alkaline phosphatase activity in liver and intestine of zinc-deficient mice. *J. Nutr.* (1992) 122(8): 1744-7.
- Mineral** Tang Aifei and Ni Guizhi (Nanjing Agricultural Univ. (China). Dept. of Veterinary Medicine). 1994. observation on the effects of high-calcium diet on serum zinc contents and activity of tissue alkaline phosphatase in laying chickens. *Chinese Journal of Veterinary Medicine*. V. 21(3) P. 15-17
- Nut def** Tang, Fang and Abe, Hiroko. effect of zinc deficiency on macrophage and mucosal epithelium of small intestine in mice. *Yingyang Xuebao* (1992) 14(4): 355-62.
- Nut def** Tang HeDi, Lei Yao, and Chen Ping. 1995. diagnosis and treatment of zinc deficiency in pigs. *Chinese Journal of Veterinary Medicine* 21(3): 8-9.
- In Vit** Tang, Shanhu, Guo, Dazhi, Duan, Mudao, Yang, Feng, and Cai, Xuelin. assessment of zinc status in chickens from the uptake of zinc-65 by blood cells and plasma in vitro. *Henong Xuebao* (1991) 5(3): 158-62.
- CP** Tang Wen, Bunting Michaeline, Zimmerman Guy A, McIntyre Thomas A, and Prescott Stephen M. 1996. molecular cloning of a novel human diacylglycerol kinase highly selective for arachidonate-containing substrates. *FASEB Journal* 10(6): A983.
- Abstract** Tannenbaum, G. S., Colle, E., and Brazeau, P. ineffectiveness of protamine zinc somatostatin as a long-acting inhibitor of growth hormone and insulin secretion. *Federation Proceedings*. 37 (3). 1978 638
- FL** Tannenbaum, Gloria Shaffer and Colle, Eleanor. ineffectiveness of protamine zinc somatostatin as long-acting inhibitor of insulin and growth hormone secretion. *Can. J. Physiol. Pharmacol.* (1980) 58(8): 951-5.
- In Vit** Tanuma, Sei-ichi and Shiokawa, Daisuke. multiple forms of nuclear deoxyribonuclease in rat thymocytes. *Biochem. Biophys. Res. Commun.* (1994) 203(2): 789-97 .
- Phys** Tao, H., Sun, Z., Liu, M., and Wen, X. 1990. [synthesis of zinc chlorophyllin a and its

preliminary clinical application]. *Hua Hsi i K'o Ta Hsueh Hsueh Pao* 21(3): 341-3.

- CP** Tao S-H, Fox, M. R. S., Fry, B. E. Jr, Hoadley, J. E., and Lee, Y. H. effects of dietary calcium on phytate mineral interaction. *75TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ATLANTA, GEORGIA, USA, APRIL 21-25, 1991. FASEB (FED AM SOC EXP BIOL) J.* 5 (5). 1991. A1313.
- CP** Tao S-H, Fox, M. R. S., Fry, B. E. Jr, Hoadley, J. E., and Lee, Y. H. interactions among zinc phytate and magnesium age effect. *73RD ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, NEW ORLEANS, LOUISIANA, USA, MARCH 19-23, 1989. FASEB (FED AM SOC EXP BIOL) J.* 3 (3). 1989. A759.
- CP** Tao S-H, Fox, M. R. S., Fry, B. E. Jr, Stone, C. L., Fletcher, C. A., and Hamilton, R. P. zinc bio availability and textured vegetable protein. *67TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, CHICAGO, ILL., USA, APRIL 10-15, 1983. FED PROC.* 42 (3). 1983. Abstract 578.
- CP** Tao, S. H., Sheu, S. S., Johnson, M. L., Fry, B. E. Jr., and Spivey Fox, M. R. bioavailability to quail of zinc in salts, food additives and supplements for humans. *Trace Substances In Environmental Health; ; Proceedings Of University Of Missouri's ... Annual Conference.* 1980. (14th) p. 85-93. ill.
- Nut def** Tao, Shyy-Hwa and Hurley, Lucille S. changes in plasma proteins in zinc-deficient rats. *Proc. Soc. Exp. Biol. Med. (1971)* 136(1): 165-7.
- Nut def** Tao, Shyy-Hwa and Hurley, Lucille S. effect of dietary calcium deficiency during pregnancy on zinc mobilization in intact and parathyroidectomized rats. *J. Nutr. (1975)* 105(2): 220-5
- Mix** Tapia-Arizmendi, G., del Angel, A. R., Arauz-Contreras, J., and Feria-Velasco, A. 1990. effects of diet composition on the reactivity pattern to the zinc-iodide/osmium-tetroxide mixture of the rat pancreatic acinar tissue. *Archivos De Investigacion Medica* 21(4): 367-74.
- Org Met** Tarasenko, N. Y., Vorobeva, R. S., Spiridinova, V. S., and Shabalina, L. P. 1974. experimental investigation of toxicity of cadmium and zinc caprylates. *Journal of Hygiene, Epidemiology, Microbiology, and Immunology* 18(2)
- Prim** Tarim, B., Hafez, A. A., Suzuki, S. H., Suzuki, S., and Cox, C. F. 1997. biocompatibility of compomer restorative systems on nonexposed dental pulps of primate teeth. *Operative Dentistry* 22(4): 149-58.
- Drug** Tasci, S., Sengil, A. Z., Altindis, M., and Arisoy, K. 1995. the effect of zinc supplementation in experimentally induced toxoplasma gondii infection. *Journal of the Egyptian Society of Parasitology* 25(3): 745-751.
- FL** Tassinari, M., Monetti, P. G. Bologna Univ. Italy Istituto di Zootechnia e Nutrizione Animale, Corradi, A., and Cantoni, A. M. Parma Univ. Italy Istituto di Anatomia Patologica Veterinaria. 1993. the use of dl-carnitine and zinc proteinate in veal (white meat) diet. 1: studies on animal performance and anatomical pathology. <original> impiego di dl-carnitina e di zinco proteinato nell'alimentazione del vitello "a carne bianca". 1: performance zootecniche e indagini anatomo-patologiche. *Atti Della Societa Italiana Delle Scienze Veterinarie.* V. 47(Pt.3) P. 1769-1772
- Mineral** Taubeneck, M. W., Domingo, J. L., Llobet, J. M., and Keen, C. L. impact of meso-2,3-dimercaptosuccinic acid (dmsa) on reproductive outcome and maternal and fetal mineral metabolism in swiss mice. *Teratology* 1991 May;43(5):418-9

- Abstract** Taubeneck, M. W., Uriu-Hare, J. Y., Commisso, J. F., Borschers, A. T., Bui, L. M., Faber, W., and Keen, C. L. maternal exposure to 2-ethylhexanoic acid (ehxa), 2-ethylhexanol (ehxo), and valproic acid (vpa) results in alterations in maternal and embryonic zinc status. *Teratology* 1996 Feb;53(2):88
- Mix** Taubeneck, Marie Weldon, Domingo, Jose L., Llobet, Juan M., and Keen, Carl L. meso-2,3-dimercaptosuccinic acid (dmsa) affects maternal and fetal copper metabolism in swiss mice. *Toxicology* (1992) 72(1): 27-40 .
- FL** Taucins, E., Svilane, A., and Valdmanis, A. relation between zinc and cadmium in chick nutrition. *Fiziol. Aktiv. Komponenty Pitan. Zhivotn.* (1969) 177-83. Editor: 177-83. Editor(s): Valdmanis, A. Publisher: Izd. "Zinatne", Riga, USSR.
- Nut** Tauson, A. H. and Forsberg, M. 1991. effect of evening primrose oil as food supplement on reproduction in the blue fox. *Acta Veterinaria Scandinavica* 32(3): 345-351.
- No Dose** Tavares, Eva, Carreras, Olimpia, Gomez-Tubio, Ana, Herce-Pagliali, Claudia, and Murillo, Maria Luisa. zinc intestinal absorption in newborn rats at 21 day postpartum: effects of maternal ethanol consumption. *Life Sci.* (1998) 62(9): 787-797.
- Nut def** Taylor, C. G. and Bray, T. M. increased lung copper-zinc-superoxide dismutase activity and absence of magnetic resonance imaging-detectable lung damage in copper-deficient rats exposed to hyperoxia. *The Journal Of Nutrition.* Apr 1991. v. 121 (4) p. 467-473. ill.
- CP** Taylor, C. G., Towner, R. A., and Bray, T. M. magnetic resonance imaging mri investigation of the effect of dietary zinc or copper deficiency and hyperoxia on the oxygen free radical defense system in rats. *74TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, PART I, WASHINGTON, D.C., USA, APRIL 1-5, 1990. FASEB (FED AM SOC EXP BIOL) J.* 4 (3). 1990. A649.
- CP** TAYLOR, C. G., TOWNER, R. A., JANZEN, E. G., and BRAY, T. M. K. J. A. (ED.). OXIDATIVE DAMAGE AND REPAIR: CHEMICAL, BIOLOGICAL AND MEDICAL ASPECTS; 5TH BIENNIAL MEETING OF THE INTERNATIONAL SOCIETY FOR FREE RADICAL RESEARCH. magnetic resonance imaging mri investigation of the effect of zinc copper nutrition of hyperoxia-induced damage in rat lung. *DAVIES : ASADENA, CALIFORNIA, USA, NOVEMBER 14-20, 1990. XXVIII+899P. PERGAMON PRESS: OXFORD, ENGLAND, UK; ELMSFORD, NEW YORK, USA. ILLUS. ISBN 0-08-041749-3; 0 (0). 1991. 820-824.*
- Nut** Taylor Carla(A) and Szczurek Elzbieta(A). 1999. immunohistochemical localization of metallothionein in rat liver, kidney and small intestine after dietary zinc manipulations. *Free Radical Biology & Medicine* 27(SUPPL. 1): S44.
- Nut def** Taylor, Carla G., Bettger, William J., and Bray, Tammy M. effect of dietary zinc or copper deficiency on the primary free radical defense system in rats. *J. Nutr.* (1988) 118(5): 613-21 .
- Nut def** Taylor, Carla G. and Bray, Tammy M. effect of hyperoxia on oxygen free radical defense enzymes in the lung of zinc-deficient rats. *J. Nutr.* (1991) 121(4): 460-6.
- Drug** Taylor, Carla G., McCutcheon, Tanja L., Boermans, Herman J., DiSilvestro, Robert A., and Bray, Tammy M. comparison of zn and vitamin e for protection against hyperoxia-induced lung damage. *Free Radical Biol. Med.* (1996) Volume Date 1997, 22(3): 543-550.
- Nut def** Taylor, Carla G., Towner, Rheal A., Janzen, Edward G., and Bray, Tammy M. mri detection of hyperoxia-induced lung edema in zinc-deficient rats. *Free Radical Biol. Med.* (1990) 9(3):

229-33.

- Nut def** Taylor, Carla Gwen. 1990. effect of dietary zinc or copper deficiency and hyperoxia on oxygen free radical-induced damage in rat lung. Avail.: *NLC From: Diss. Abstr. Int. B* 1991. 51. 8. 3787-8. U
- No Oral** Taylor, D. M. and Volf, V. oral chelation treatment of injected americium-241 or plutonium-239 in rats. *Health Phys.* (1980) 38(2): 147-58.
- Unrel** Taylor, G. A., Thompson, M. J., Lai, W. S., and Blackshear, P. J. 1996. mitogens stimulate the rapid nuclear to cytosolic translocation of tristetraprolin, a potential zinc-finger transcription factor. *Molecular Endocrinology* 10(2): 140-6.
- Gene** Taylor-Harris Pamela, Swift Sally, and Ashworth Alan(A). 1995. zfy1 encodes a nuclear sequence-specific dna binding protein. *FEBS Letters* 360(3): 315-319.
- Rev** TAYLOR, M. C., DEMAYO, A., and TAYLOR, K. W. effects of zinc on humans laboratory and farm animals terrestrial plants and fresh water aquatic life. *CRIT REV ENVIRON CONTROL*; 12 (2). 1982. 113-181.
- Abstract** Taylor, R. B. hematologic effects of dietary zinc and edta administered to mice pre natally and post natally. 91ST ANNUAL MEETING OF THE OHIO ACADEMY OF SCIENCE, COLUMBUS, OHIO, USA, APRIL 23-25, 1982. *OHIO J SCI.* 82 (2). 1982. 38.
- FL** Tazaki, Yasukazu and Yamada, Tsutomu. effect of minimal trace elements on dietary induced atherosclerosis in new zealand white rabbit aorta. *Nichidai Igaku Zasshi* (1993) 52(3): 145-57 CODEN: NICHAS; ISSN: 0029-0424.
- Acu** Teirlynck, O., Kaufman, J. M., Bogaert, M. G., and Roels, H. testicular toxicity induced by single dosing of di- and mono(2-ethylhexyl) phthalate in the rat. *Toxicol. Lett.* (1988) 40(1): 85-91
- FL** Tejнора, J., Bauer, B., and Broz, J. 1975. tests of the czechoslovak growth stimulant carbadox in the feeds cos 1and cos 2. *Biologizace a Chemizace Vyzivy Zvirat* 11(2): 139-145.
- In Vit** Telford, W. G. and Fraker, P. J. 1998. zinc induced apoptosis in bone marrow and splenic b-lineage lymphocytes of the mouse. *Nutrition Research.* 18(2): 319-326.
- CP** Teller, E. B., Kimmel, P. L., Watkins, D. W., and Langman, C. B. zinc nutritional status modulates the 1 25 dihydroxyvitamin d response to low calcium lc diet d . *MEETING OF THE AMERICAN SOCIETY OF NEPHROLOGY, WASHINGTON, D.C., USA, DECEMBER 7-10, 1986. KIDNEY INT.* 31 (1). 1987. 358.
- Phys** Templeton, D. M., Banerjee, D., and Cherian, M. G. 1985. metallothionein synthesis and localization in relation to metal storage in rat liver during gestation. *Canadian Journal of Biochemistry and Cell Biology* 63(1): 16-22.
- Nut def** Templeton, D. M. and Cherian, M. G. 1984. effects of zinc deficiency on pre-existing cadmium-metallothionein in the pancreas (rats). *Toxicology.* 29 (3): 251-260.
- CP** Tenegrup, I., Aagren, M. S., Bonderson, L., Forsgren, A., Hallmans, G., and Soederberg, T. 1985. the effect of zinc and occlusion on the healing of open wounds. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th* : Meeting Date 1984, 87-9. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK. CODEN: 55DSAX.
- Carcin** Tenen, D. G., Hromas, R., Licht, J. D., and Zhang, D. E. 1997. transcription factors, normal

myeloid development, and leukemia. *Blood* 90(2): 489-519.

- Gene** Teng, H. and Grubmeyer, C. 1999. mutagenesis of histidinol dehydrogenase reveals roles for conserved histidine residues. *Vol. 38, No. 22, Pp. 7363-7371 Biochemistry (Washington)*
- Drug** Tengrup, I., Ahonen, J., Rank, F., and Zederfeldt, B. 1980. cytochemical study of granulation tissue in zinc treated rats. *Acta Chirurgica Scandinavica* 146(4): 243-6.
- CP** Tengrup, I., Ahonen, J., and Zederfeldt, B. influence of zinc on synthesis and accumulation of collagen in early granulation tissue (rats). *Proceedings ... Symposium On Trace Element Metabolism In Man And Animals.* 1981 (pub. 1982). 1981 (pub. 1982). (4th) p. 345-347.
- CP** Tengrup, Ingrid, Ahonen, J., Rank, F., and Zederfeldt, B. 1978. the effect of zinc supply on granulation tissue in young and old rats. *Trace Elem. Metab. Man Anim. Proc. Int. Symp., 3rd : Meeting Date 1977, 350-3.* Editor(s): Kirchgessner, M. Publisher: Arbeitskreis Tierernaehrungsforschung Weihestephana Inst. Ernaehrungsphysiol., Freising-Weihestephana, Ger.
- Drug** Tennican, P., Carl, G., Frey, J., Thies, C. , and Chvapil, M. 1980. topical zinc in the treatment of mice infected intra vaginally with herpes genitalis virus. *Proceedings of the Society for Experimental Biology and Medicine.* 164(4): 593-597.
- No Oral** Tennican, P. O., Carl, G. Z., and Chvapil, M. the diverse effects of topical and systemic administration of zinc on the virulence of herpes simplex genitalis. *LIFE SCI. Life Sciences.* 24 (20). 1979. 1877-1884.
- CP** Tennican, Patrick O., Carl, Gary Z., and Chvapil, Milos. 1978. antiviral activity of zinc-medicated collagen sponges against genital herpes simplex. *Curr. Chemother. Proc. Int. Congr. Chemother., 10th : Meeting Date 1977, Volume 1, 363-6.* Editor(s): Siegenthaler, Walter; Luethy, Ruedi. Publisher: Am. Soc. Microbiol., Washington, D. C. CODEN: 37XLA2.
- Unrel** Tepel, J., Darwisch el Sawaf, M., and Hoppe, W. 1994. reaction of inflamed periapical tissue to intracanal medicaments and root canal sealers. *Endodontics & Dental Traumatology* 10(5): 233-8.
- Nut def** Teraki, Ryoji, Tanaka, Ayako, Chiba, Tsugumichi, and Uchiumi, Akira. effect of a low-zinc diet on trace metal metabolism in pregnant rats. *Rinsho Yakuri (1984)* 15(1): 237-8
- CP** Teraki, Y., Chiba, T., and Nagumo, K. influence of the chelating agent di sodium edta in the developing chick embryo. *20TH ANNUAL MEETING OF THE CONGENITAL ANOMALIES RESEARCH ASSOCIATION OF JAPAN, OSAKA, JAPAN, JULY 11-12, 1980. TERATOLOGY.* 22 (1). 1980. 12a.
- FL** TERAKEI, Y. and MAEMURA, S. correlation of metal intake and maternal blood metal concentration in pregnant and non-pregnant rats. *CONGEN ANOM(SENTEN IJO)* 26:249,1986
- Abstract** TERAKEI, Y. and MAEMURA, S. 1985. effects of aspirin on plasma proteins and inorganic metals in rats. *TWENTY-FIFTH ANNUAL MEETING OF THE JAPANESE TERATOLOGY SOCIETY*
- Abstract** Teraki, Y., Okumura, Y., and Maemura, S. mineral metabolism in zinc-deficient rats. *Teratology* 1989;40(6):677
- Abstract** Teraki, Y., Tanaka, A., Chiba, T., and Nagumo, K. zinc iron and copper metabolism in pregnant rats on zinc deficient diet. *89TH ANNUAL MEETING OF THE JAPANESE ASSOCIATION OF*

ANATOMISTS, SENDAI, JAPAN, APR. 3-5, 1984. ACTA ANAT NIPPON. 59 (4). 1984. 567.

- Mineral** Teraki, Y. and Uchiumi, A. mineral metabolism in zinc-deficient rats. *Trace Elem. Man Anim.* 7: Monogr. Proc., Round Tables Discuss. Int. Symp., 7th : Meeting Date 1990, 19-5-19/7. Editor(s): Momcilovic, Berislav. Publisher: Inst. Med. Res. Occup. Health Univ. Zagreb, Zagreb, Yugoslavia..
- Nut def** Teraki, Y. and Uchiumi, A. taste buds and saliva and plasma zinc levels in zinc-deficient rats. *Biomed. Res. Trace Elem.* (1990) 1(2): 159-60 CODEN: BRTEE5; ISSN: 0916-717X.
- FL** Teraki, Yoshimi and Shu, Meijin. behavior of zinc in hen-egg shells. *Igaku to Seibutsugaku* (1984) 109(1): 35-7.
- Phys** Teresa Macarulla M, Martinez, J. A., Marcos, R., and Larralde, J. influence of faba bean vicia-faba l. intake on the lymphoblastic proliferation and the complement system. *AN BROMATOL. Anales De Bromatologia.* 43 (4). 1991. 383-393.
- In Vit** Tergau, F., Weichert, J., Quentin, I., Opitz, R., von Zezschwitz, C., Marwitz, J., Ritz, V., and Steinfelder, H. J. 1997. inhibitors of ser/thr phosphatases 1 and 2a induce apoptosis in pituitary gh sub(3) cells. *Vol. 356, No. 1, Pp. 8-16* Naunyn-Schmiedeberg's Arch. Pharmacol.
- Nut def** Terhune, M. W. and Sandstead, H. H. decreased rna polymerase activity in mammalian zinc deficiency. *Science* (1972) 177(4043): 68-9.
- Abstract** Terracio, L. and Douglas, W. H. J. densitometric evaluation of growth in primary cultures of rat ventral prostate epithelial cells. *20TH ANNUAL MEETING OF THE SOUTHERN SOCIETY OF ANATOMISTS, AUGUSTA, GA., USA, OCT. 16-18, 1980. ANAT REC.* 199 (2). 1981. 305-306.
- Nut def** Terril-Robb, Lizabeth A., Clemons, Donna J., Besch-Williford, Cynthia, O'Brien, Dennis P., and O'Dell, Boyd L. morphophysiologic characterization of peripheral neuropathy in zinc-deficient guinea pigs. *Proc. Soc. Exp. Biol. Med.* (1996) 213(1): 50-58.
- FL** Tertishnii, V. G. 1975. effect of additional dietary zinc on the activities of lactate- and succinate-dehydrogenases in the blood of bull calves. *Fiziologiya i Biokhimiya Sil's'Kogospodars'Kikh Tvarin* 27: 35-37.
- FL** Tesarova, J., Slavik, L., and Madarova, M. 1972. possible complete replacement of chlortetracycline by zinc bacitracin in feeds for broilers. evaluation of health and ultimate product. *Zivocisna Vyroba* 17(11): 797-805.
- FL** Tesarova, J., Slavik, L., and Skarka, P. 1974. zn bacitracin in feeds for broilers (occurrence of residues and effect on sex of the broilers). *Zivocisna Vyroba.* 19(3): 225-232.
- CP** Tevosian, S. G., Deconinck, A. E., Cantor, A. B., Rieff, H. I., Fujiwara, Y., Corfas, G., and Orkin, S. H. 1999. fog-2: a novel gata-family cofactor related to multitype zinc-finger proteins friend of gata-1 and u-shaped. *Vol. 96, No. 03, Pp. 950-955* Proceedings Of The National Academy Of Sciences, Usa
- BioX** Tewatia, B. S. and Bhatia, S. K. 1996. comparative studies in rumen ammonia anabolising enzymes, microbial and mineral profiles between buffalo and cattle fed fibrous diet. *Buffalo Journal* 12(2): 169-179.
- Phys** Tezel Gaye, Nagasaka Tetsuro, Iwahashi Naoko, Asai Naoya, Iwashita Toshihide, Sakata Keita, and Takahashi Masahide(A). 1999. different nuclear/cytoplasmic distributions of ret finger protein in different cell types. *Pathology International* 49(10): 881-886.

- Org Met** Thaete, L. G., Crouch, R. K., Buse, M. G., and Spicer, S. S. 1985. the protective role of copper-zinc superoxide dismutase against alloxan-induced diabetes: morphological aspects. *Diabetologia* 28(9): 677-82.
- In Vit** Thakran, P., Leuschen, M. P., and Ebadi, M. 1989. metallothionein induction in rat hippocampal neurons in primary culture. *In Vivo* 3(3): 191-7.
- Not Avail** Tharwat, E. E. 1998. the use of zinc sulfate to improve semen characteristics and fertility of new zealand white rabbit bucks during hot season. *Annals of Agricultural Science (Cairo)* (Special Issue, Volume 3): 757-770.
- Abstract** Theall, C., Beguin, D., and Wallwork, J. effects of varying levels of mineral mix in purified rat diets on growth and mineral stores. 71ST ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, WASHINGTON, D.C., USA, MARCH 29-APRIL 2, 1987. *FED PROC.* 46 (3). 1987. 906.
- No Oral** Theoret, Y., Earnhardt, T. S., Bouldin, T. W., and Krigman, M. R. the neurotoxicity of intrahippocampal kainic acid injection in rats is not accompanied by a reduction of timm stain. *Brain Res. (1988)* 449(1-2): 341-6.
- CP** Thiel, U., Weigand, E., Hoppe, P. P., Schoner, F. J., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. zinc retention of broiler chickens as affected by dietary supplementation of zinc and microbial phytase. <Document Title>Trace Elements in Man and Animals - TEMA 8:Proceedings of the Eighth International Symposium on Trace Elements InMan and Animals. 658-659.
- Ecol** Thielen, C. 1993. feeding management of fattening pigs in organic farming. 104 pp.
- Gene** Thien, H., Buscher, D., and Ruther, U. 1996. cloning and sequence analysis of the murine gli3 cDNA. *Biochimica Et Biophysica Acta* 1307(3): 267-9.
- CP** Thoday, K. L. 1989. diet-related zinc-responsive skin disease in dogs: a dying dermatosis? *The Journal Of Small Animal Practice.* 30(4): 213-215.
- CP** Thomas, D. G., Dingman, A. D., and Garvey, J. S. the function of metallothionein in cell metabolism. KAGI, J. H. R. AND Y. KOJIMA (ED.). EXPERIENTIA SUPPLEMENTUM, VOL. 52. METALLOTHIONEIN II; SECOND INTERNATIONAL MEETING ON METALLOTHIONEIN AND OTHER LOW MOLECULAR WEIGHT METAL-BINDING PROTEINS, ZURICH, SWITZERLAND, AUGUST 21-24, 1985. XII+755P. BIRKHAUSER VERLAG AG: BASEL, SWITZERLAND; BOSTON, MASSACHUSETTS, USA. ILLUS. ISBN 3-7643-1804-X; ISBN 0-8176-1804-X. 0 (0). 1987. 539-544.
- CP** THOMAS, D. J. and CAFFREY, T. 1990. dna fragmentation in mouse thymus after lipopolysaccharide treatment. 74TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY
- In Vit** Thomas, Dafydd G., Dingman, Allen D., and Garvey, Justine S. 1987. the function of metallothionein in cell metabolism. *Experientia Suppl.* 52: (Metallothionein 2), 539-43 .
- No Oral** Thomas, David J. and Winchurch, Richard A. altered organ growth and zinc and copper distribution in endotoxin-treated neonatal mice. *Pediatr. Res. (1991)* 30(2): 141-5.
- Unrel** Thomas, G. P., Boyd, J. B., Soni, N. N., and Palmer, J. E. 1995. histologic study of pulp capping using chlorhexidine in dogs. *NDA Journal* 46(1): 17-20.

- Abstract** Thomas, H. R. and Kornegay, E. T. evaluation of a zinc methionine complex as a growth stimulant for swine. *Journal of Animal Science*. 39 (1). 1974 190
- Abstract** Thomas, H. R. and Kornegay, E. T. failure of supplemental zinc proteinate zinc sulfate and methionine to stimulate growth rate and feed efficiency of swine. *Virginia Journal of Science*. 26 (2). 1975 46
- Nut def** Thomas, J. A., Wienckowski, D. B., Gillies, B. A., Thomas, M. J., and Youkilis, E. J. 1986. effects of phthalic acid esters (paes) on the neonate and aspects of teratogenic actions. *Environmental Health Perspectives* 65: 243-8.
- No Dose** Thomason, D. M., Leighton, A. T. Jr, and Mason, J. P. Jr. 1976. a study of certain environmental factors and mineral chelation on the reproductive performance of young and yearling turkey hens. *Poultry Science* 55(4): 1343-55.
- Nut** Thompson, D. B. and Fosmire, G. J. 1988. determination of zinc bioavailability from soy protein concentrates by slope-ratio analysis. *Journal Of Food Science : An Official Publication Of The Institute Of Food Technologists*. 53(1): 204-207.
- Drug** Thompson, J. S. and Morice, A. H. 1996. neutral endopeptidase inhibitors and the pulmonary circulation. *General Pharmacology* 27(4): 581-5.
- Nut** Thompson, L. U., Boland, K., Chapkin, R., and Jones, J. D. nutritional evaluation of residual meal from rapeseed protein concentration process in rats. *Nutrition Reports International*. 25 (4). 1982. 621-628.
- Nut** Thompson, P., Roseborough, R., Russek, E., Jacobson, M., and Moser, P. B. 1986. zinc status and sexual development in adolescent girls. *Journal Of The American Dietetic Association* 86(7): 892-897.
- Nut def** Thompson, R. W. and Gilbreath, R. L. 1976. effects of zinc deficiency on swine skin collagen and zinc. *Nutrition Report International* 13(3): 253-261.
- Nut** Thompson, S. A. and Weber, C. W. 1981. effect of dietary fiber sources on tissue mineral levels in chicks. *Poultry Science* 60(4): 840-5.
- Unrel** Thong, P. S. P., Selley, M., and Watt, F. elemental changes in atherosclerotic lesions using nuclear microscopy. *Cell. Mol. Biol. (Paris)* (1996) 42(1): 103-110
- Unrel** Thong, P. S. P(A), Makjanic, J., and Watt, F. 1996. a review of nuclear microscopy and applications in medicine. *Singapore Medical Journal* 37(5): 527-531.
- No Oral** Thor, D. H. and Flannelly, K. J. 1977. anosmia and toxicity of topical intra nasal zinc. *Physiological Psychology*. 5(2): 261-269.
- No Oral** Thor, D. H. and Flannelly, K. J. 1977. peripheral anosmia and social investigatory behavior of the male rat. *Behavioral Biology* 20(1): 128-34.
- No Oral** Thor, D. H. and Holloway, W. R. Jr. 1982. anosmia and play fighting behavior in prepubescent male and female rats. *Physiology & Behavior* 29(2): 281-5.
- Bio Acc** Thorlacius-Ussing, O. and Danscher, G. 1985. selenium in the anterior pituitary of rats exposed to sodium selenite: light and electron microscopic localization. *Toxicology and Applied Pharmacology* 81(1): 67-74.

- No Dose** Thurston, R. J., Korn, N., Froman, D. P., and Bodine, A. B. 1993. proteolytic enzymes in seminal plasma of domestic turkey (*Meleagris gallopavo*). *Biology of Reproduction* 48(2): 393-402.
- CP** Tibbets, G. W., Seerley, R. W., Neathery, M. W., and Mcguire, S. O. zinc-65 uptake in rats fed different poultry offal silages. *MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE (SOUTHERN SECTION), ORLANDO, FLA., USA, FEB. 7-10, 1982. J ANIM SCI.* 55 (Suppl. 1). 1982 (Recd. 1983). 59-60.
- Biom** Tiber, A. M., Sakhaii, M., Joffe, C. D., and Ratnaparkhi, M. V. 1986. relative value of plasma copper, zinc, lipids and lipoproteins as markers for coronary-artery disease. *Atherosclerosis* 62(2): 105-110.
- In Vit** Tiedge Markus, Lortz Stephan, Mujndy Rex, and Lenzen Sigurd(A). 1998. complementary action of antioxidant enzymes in the protection of bioengineered insulin-producing rinm5f cells against the toxicity of reactive oxygen species. *Diabetes* 47(10): 1578-1585.
- Org Met** TIETJEN, H. P. zinc phosphide: its development as a control agent for black-tailed prairie dogs. *US FISH WILDL SERV SPEC SCI REP-WILDL;* (195). 1976 1-14
- No COC** Timms, B. G. and Chandler, J. A. 1985. the effects of estradiol-17-beta on the ultrastructure and subcellular-distribution of zinc in the prostatic epithelium of castrated rats. *Prostate* 6(1): 61-79.
- No Oral** Timms, B. G. and Hagen, J. A. immunohistochemical localization of metallothionein in the rat prostate gland during postnatal development. *Prostate (N. Y.)* (1989) 14(4): 367-82
- Nut def** Tinius, T. P., Beckwith, B. E., and Halas, E. S. effects of mild perinatal zinc deficiency on passive avoidance. *Nutrition and Behavior.* 3 (2). 1986. 163-168.
- No Oral** Tintner, R., Dunn, A. J., Iuvone, P. M., Shukla, J. B., and Rennert, O. M. acth increases cerebral poly amine content. *Journal of Neurochemistry.* 33 (5). 1979. 1067-1074.
- Aquatic** TISHINOVA, V. study about the toxic action of zinc on one summer old carp: i. lethal concentrations. *GOD SOFII UNIV BIOL FAK;* 67 (1). 1972-1973 (1975) (RECD 1976) 107-110
- Unrel** Tishinova, V. 1975.*Study of the Toxic Effect of Zinc on One-Summer Old Carp. Part I. Lethal Concentrations*
- Unrel** Tjalve, H. and Frank, A. 1984. tapetum lucidum in the pigmented and albino ferret. *Experimental Eye Research* 38(4): 341-51.
- No COC** Tkadlec, E. 1990. optimum concentration of zinc phosphide in rodenticidal baits against the common vole (*microtus arvalis*). *Folia Zool.* 39(3): 227-236.
- No COC** Tkadlec, E. and Gattermann R. 1993. circadian changes in susceptibility of voles and golden hamsters to acute rodenticides. *J.Interdisciplinary Cycle Res.* 24(3): 153-161.
- Org Met** Tkadlec, Emil and Gattermann, Rolf. circadian changes in susceptibility of voles and golden hamsters to acute rodenticides. *J. Interdiscip. Cycle Res.* (1993) 24(3): 153-61.
- In Vit** Tobey, R. A., Enger, M. D., Griffith, J. K., and Hildebrand, C. E. zinc-induced resistance to alkylating agents: lack of correlation between cell survival and metallothionein content. *Toxicol. Appl. Pharmacol.* (1982) 64(1): 72-8.
- In Vit** Tobey, Robert A., Enger, M. Duane, Griffith, Jeffrey K., and Hildebrand, C. Edgar. zinc-induced

resistance to alkylating agent toxicity. *Cancer Res.* (1982) 42(8): 2980-4 .

- No Oral** Tobia, Mario H., Zdanowicz, Martin M., Wingertzahn, Mark A., Mcheffey-Atkinson, Barbara, Slonim, Alfred E., and Wapnir, Raul A. the role of dietary zinc in modifying the onset and severity of spontaneous diabetes in the bb wistar rat. *Mol. Genet. Metab.* (1998) 63(3): 205-213.
- Unrel** Tobias, R. S., Plant, C. G., and Browne, R. M. 1981. a comparative pulpal study of the irritant effects of silicate cements. *British Dental Journal* 150(5): 119-24.
- Drug** Tobin, R. B., Friend, B., Berdanier, C. D., Mehlman, M. A., and DeVore, V. 1976. metabolic responses of rats to chronic theophylline ingestion. *Journal of Toxicology and Environmental Health* 2(2): 361-9.
- FL** Tocchini, M. Pisa Univ. Italy Dipartimento di Produzioni Animali, Cappello, G., Degl'Innocenti, D., and Fronte, B. 1996. effects of protected zn-bacitracin on broilers performances. <original> effetti della zn-bacitracina protetta sulle performance dei broiler . *Annali Della Facolta' Di Medicina Veterinaria Di Pisa*. V. 49 P. 103-112
- Bact** Tocco-Bradley, R. and Kluger, M. J. 1984. zinc concentration and survival in rats infected with salmonella typhimurium. *Infection and Immunity* 45(2): 332-8.
- No Oral** Tocco-Bradley, Rosalie and Kluger, Matthew J. zinc concentration and survival in rats infected with salmonella typhimurium. *Infect. Immun.* (1984) 45(2): 332-8
- No Oral** Tocco-Bradley, Rosalie, Kluger, Matthew J., and Kauffman, Carol A. effect of age on fever and acute-phase response of rats to endotoxin and salmonella typhimurium. *Infect. Immun.* (1985) 47(1): 106-11 .
- Diss** Tocco, R. 1983. zinc concentration and survival in rats infected with salmonellatypthimurium. *Dissertation Abstracts International, B* 44(6): 1738.
- Abstract** Tocco, R. J. and Kluger, M. J. zinc and survival during infection with salmonella-typhimurium. 67TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, CHICAGO, ILL., USA, APRIL 10-15, 1983. *FED PROC.* 42 (5). 1983. Abstract 5249.
- Diss** Tocco, Rosalie. 1983. zinc concentration and survival in rats infected with salmonella typhimurium . Avail.: Univ. Microfilms Int. Order No. DA8324298 From: Diss. Abstr. Int. B 1983, 44. 6. 1738. 152 pp.
- Gene** Toder, R., Wilcox, S. A., Smithwick, M., and Graves, J. A. 1996. the human/mouse imprinted genes igf2, h19, snrpn and znf127 map to two conserved autosomal clusters in a marsupial. *Chromosome Research* 4(4): 295-300.
- No Oral** Toens C(A), Klosterhalfen, B., Klein, H. M., Rau, H. M., Anurov, M., Oettinger, A., and Schumpelick, V. 1997. induction of heat shock protein 70 (hsp70) by zinc bis (dl-hydrogen aspartate) reduces ischemic small-bowel tissue damage in rats. *Langenbecks Archiv Fuer Chirurgie* 382(1): 43-48.
- FL** Tokar', V., Voronov, P., and Makartsev, N. 1984. effect of premixes on growth and carcass quality of pigs. *Svinovodstvo, Moscow* (7): 34-35.
- FL** Tokobaev, E. M., Rubtsova, L. F., and Logunova, N. E. 1986. role of fat-soluble vitamins a and e and of sodium selenite onmetabolism in sheep. *Mikroelementy v Zhivotnovodstve i*

Rasteniyevodstvo, Frunze, Kirgiz SSR (21): 3-29.

- FL** Tokosova, M. and Pleva, J. 1988. effect of growth stimulants on health and performance of broilerchickens. *Veterinarni Medicina* 33(5): 303-311.
- FL** Tokseitov, M. T. 1987. feed dicalcium phosphate in the diet for young bulls. *Zhivotnovodstvo* (4): 43-44.
- Nut def** Tom, K., Chen, M., Goettlich-Riemann, W., Tanimoto, J., Grey, S., Wake, D., and Rucker, R. B. 1977. collagen and elastin metabolism in relation to dietary zinc and copper in the chick and rat. *Nutrition Reports International* 15(2): 191-198.
- FL** Tomme, M. F. and Gruzdev, N. V. 1978. effect of zinc on metabolism and sperm production of bulls. *Vestnik Sel'Skokhozyaistvennoi Nauki, Moscow, USSR* (3): 71-76.
- Phys** Tommerup, N. and Vissing, H. 1995. isolation and fine mapping of 16 novel human zinc finger-encoding cdnas identify putative candidate genes for developmental and malignant disorders. *Genomics* 27(2): 259-64.
- Nut def** Tomoda, K. experimental study on the effects of zinc on surgical metabolism effects of various dietary concentrations of zinc on regeneration following partial hepatectomy. *Journal of the Kansai Medical University*. 33 (2). 1981 (Recd. 1982). 230-258.
- Nut def** Tomoda, Kazuhiko, Miyake, Akira, Idei, Yasuo, Yamamura, Manabu, Hioki, Kohshiro, and Yamamoto, Masakatsu. effect of zinc on postoperative metabolism. *Jutsugo Taisha Kenkyu Kaishi* (1978) 12(1): 114-18.
- CP** Tomosugi, N., Yamaya, H., Nakamura, M., Takata, K., Ishii, H., Nakazawa, T., Asaka, M., Yuri, T., and Ishikawa, I. 1995. zinc deficit diet blunts the activity of metalloproteinase-2 (mmp-2) expressed in anti-gbm antibody nephritis. *Journal of the American Society of Nephrology* 6(3): 913.
- FL** Tomov, T., Iliev, Ya., Ibrishimov, N., Kirov, A., Dyakov, L., and Mentov, V. 1980. effect of "bacitrafen premix" (a growth promoter based on zincbacitracin) on laying hens and broilers. *Veterinarnomeditsinski Nauki* 17(8): 65-71.
- FL** Tomov, T., Iliev, Ya., Ibrishimov, N., Kirov, A., Dyakov, L., and Mentov, V. 1980. effect of the preparation bacitraphen premix on laying hens and broilerchickens. *Veterinarnomeditsinski Nauki* 17(8): 65-71.
- FL** Toncheva, E. and Stanchev, K. the effect of zinc on some metabolic parameters of lamb jejunum enterocytes. *Zhivotnov'Dni Nauki*. 22 (6). 1985. 54-58.
- FL** Toncheva, E. and Stanchev, Kh. 1985. effect of zinc on some metabolic indices in enterocytes in the jejunum of lambs. *Zhivotnov"Dni Nauki* 22(6): 54-58.
- Nut** Toncheva Ema and Profirov Yanko. 1997. kinetic characteristics of leucine aminopeptidase in intestine epithelium in ruminants at crossing and different zinc levels in diet. *Zhivotnov"Dni Nauki* 34(3-4): 53-56.
- FL** Toncheva, Ema, Stanchev, Khristo, and Siriak, Kuba. influence of dietary zinc level on growth performance and biochemical characteristics of broiler chickens. *Zhivotnovud. Nauki* (1999) 36(3-4): 80-87.
- Phys** Tonder, N., Johansen, F. F., Frederickson, C. J., Zimmer, J., and Diemer, N. H. 1990. possible

role of zinc in the selective degeneration of dentate hilar neurons after cerebral ischemia in the adult rat. *Neuroscience Letters* 109(3): 247-52.

- Abstract** Tongtavee, K. efficacy tests of different rodenticides on some species of rats in thailand. *9TH VERTEBRATE PEST CONFERENCE, FRESNO, CALIF., USA, MAR. 4-6, 1980. PROC VERTEBR PEST CONF. 0 (9). 1980. 143-145.*
- Nut def** Toniatti, G., Seri, S., Accinni, L., Ranucci, A., Del Gobbo, V., Famularo, G., and Aquilio, E. alterations of the thymus in zinc deficiency. *Folia Allergol. Immunol. Clin. (1986) 33(6): 417-26 CODEN: FAICAZ; ISSN: 0303-8432.*
- Nut def** Topp, H., El-Zyat, E., Schoch, G., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. the effects of dietary zinc deficiency on the whole body degradation rates of transfer-, ribosomal- and messenger rna in growing rats. 915-922.
- Nut def** Topping, D. L., Clark, D. G., and Dreosti, I. E. 1981. impaired thermoregulation in cold-exposed zinc-deficient rats: effect of nicotine. *Nutrition Reports International. 24 (4): 643-648.*
- Nut def** Topping, D. L., Illman, R. J., Dreosti, I. E., Trimble, R. P., and Record, I. R. 1978. effects of zinc deficiency on bile acid secretion in the rat. *Nutrition Reports International 18(6): 631-637.*
- Nut def** Topping, David L., Clark, Dallas G., and Dreosti, Ivor E. impaired thermoregulation in cold-exposed zinc-deficient rats : effect of nicotine. *Nutr. Rep. Int. (1981) 24(4): 643-8.*
- Unrel** Torabinejad, M., Ford, T. R., Abedi, H. R., Kariyawasam, S. P., and Tang, H. M. 1998. tissue reaction to implanted root-end filling materials in the tibia and mandible of guinea pigs. *Journal of Endodontics 24(7): 468-71.*
- No COC** Torbay, N., Bracco, E. F., Geliebter, A., Stewart, I. M., and Hashim, S. A. 1985. insulin increases body fat despite control of food intake and physical activity. *American Journal of Physiology 248(1 Pt 2): R120-4.*
- Mineral** Tordoff Michael G. 1994. voluntary intake of calcium and other minerals by rats. *American Journal of Physiology 267(2 PART 2): R470-R475.*
- Alt** Toroptysev, I. V. and Eshchenko, V. A. 1971. distribution of zinc, insulin, and acid phosphatase in the rabbits ' islets of langerhans during diabetes development , induced by selective injury of b cells. *Arkh. Patol. 33(3): 43-9 .*
- No Oral** Toroptysev, I. V. and Eshchenko, V. A. mechanism of the damaging effect of chelants on pancreatic islet cells. *Byulleten' Eksperimental'noi Biologii i Meditsiny. 94 (7). 1982. 100-102.*
- FL** Toroptysev, I. V. and Eshchenko, V. A. 1982. [mechanism of the harmful action of chelating agents on pancreatic islet cells]. <original> mekhanizm povrezhdaushchego deistviia khelantov na kletki pankreaticheskikh ostrovkov. *Biulleten' Eksperimental'noi Biologii i Meditsiny 94(7): 100-2.*
- No COC** Toroptysev, I. V. and Eshchenko, V. A. some regularities in the distribution of zinc insulin and acid phosphatase in rabbit islets of langerhans in the development of diabetes induced by selective injury of b cells. *Arkhiv Patologii. 33 (3). 1971 43-49.*
- FL** Toroptysev, I. V. and Eshchenko, V. A. 1971. [some regularities in the distribution of zinc, insulin and acid phosphatase in the islands of langerhans of rabbits during the development of diabetes produced by selective injury of b cells]. <original> nekotorye zakonomernosti razpredeleniia tsinka, insulina i kisloi fosfatazy v ostrovkakh langergansa krolikov v dinamike razvitiia diabeta,

poluchemogo izbiratel'nym povrezhdeniem keltok. *Arkhiv Patologii* 33(3): 43-9.

- FL** Toroptsev, I. V. and Eshchenko, V. A. 1982. [toxic action of chelating agents on the animal hippocampus]. <original> issledovanie toksicheskogo deistviia khelantov na gippokamp u zhivotnykh. *Farmakologiya i Toksikologiya* 45(6): 82-4.
- Bact** Tortuero, F. 1973. influence of the implantation of lactobacillus acidophilus in chicks on the growth, feed conversion, malabsorption of fats syndrome and intestinal flora. *Poultry Science* 52(1): 197-203.
- FL** Tortuero, F. and Brenes, A. 1979. biological use of different sources of zinc by broilers. *Avances En Alimentacion y Mejora Animal* 20(10): 373-374.
- FL** Tortuero, F. and Brenes, A. 1977. different proportions of zinc in the diet and the process of ossification in chickens. *Avances En Alimentacion y Mejora Animal* 18(3): 139-143.
- FL** Tortuero, F. and Brenes, A. Consejo Superior de Investigaciones Cientificas Madrid Spain Instituto de Alimentacion y Productividad Animal. 1977. [study of different zinc levels on diet for the ossification process of chickens]. <original> estudio de diferentes niveles de zinc en la dieta sobre el proceso de osificacion en los pollos. *Avances En Alimentacion y Mejora Animal*. V. 18(3) P. 139-143
- FL** Tortuero, F. and Diez Tardon, M. V. 1983. possibilities of using concentrates low in phosphorus in diets for broilers during the finishing period. *Avances En Alimentacion y Mejora Animal* 24(2): 63-66.
- FL** Tortuero, F., Fernandez, E., and Rioperez, J. effects of sepiolite on mineral metabolism and skeletal development in chickens. *Arch. Zootec. (1993)* 42(160): 401-8 .
- Nut** Tortuero, F., Rioperez, J., and Martin, L. 1993. effect of dietary sepiolite supplementation on the performance, egg composition and mineral metabolism in laying hens. *Archivos De Zootecnia* 42(159): 347-360.
- FL** Tot, K., Sepvel'di, Yu., Nad', K., Dvorzhak, E., Gaal, E., Gergei, A., Komandi, K., Antal, M., and Biro, D. 1988. study of the safety of the textured soya product, bechei, in a three-month experiment. *Voprosy Pitaniya* (3): 38-41.
- FL** Tot, K., Sepvel'di Yu, Nad', K., Dvorzhak, E., Gaal, E., Gergei, A., Komandi, K., Antal, M., and Biro, D. three-month safety test of a textured soy product called becsei. *Voprosy Pitaniya*. 0 (3). 1988. 38-41.
- Nut def** Toth, Erika and Remes, P. effect of increased depletion of copper, supplementary cholesterol diet and stress on the cholesterol concentration in wall of rat thoracic aorta. *Acta Physiol. Hung.* (1994) 82(2): 125-30.
- Unrel** Tourtellotte Warren G and Milbrandt Jeffrey(A). 1998. sensory ataxia and muscle spindle agenesis in mice lacking the transcription factor egr3. *Nature Genetics* 20(1): 87-91.
- IMM** Towers, N. R. 1976. more light on zinc and facial eczema. *New Zealand Journal of Agriculture* 132(1): 25-27.
- Nut def** Towers, N. R., Young, P. W., and Wright, D. E. 1981. effect of zinc supplementation on bovine plasma copper. *New Zealand Veterinary Journal* 29(7): 113-114.
- Nut def** Towers, Neale R. effect of zinc on the toxicity of the mycotoxin sporidesmin to the rat. *Life Sci.*

(1977) 20(3): 413-17.

- CP** Townsend, S. F., Krebs, N. F., Briggs, K. K., and Hambridge, K. M. zinc effect on fetal hepatocyte proliferation and insulin-like growth factor ii igf-ii expression. *JOINT MEETING OF THE WESTERN SOCIETY FOR CLINICAL INVESTIGATION, WESTERN SECTION AMERICAN FEDERATION FOR CLINICAL RESEARCH, WESTERN SOCIETY FOR PEDIATRIC RESEARCH, WESTERN REGION SOCIETY FOR INVESTIGATIVE DERMATOLOGY, AND THE WESTERN STUDENT MEDICAL RESEARCH COMMITTEE, CARMEL, CALIFORNIA, USA, FEBRUARY 5-8, 1992. CLIN RES. 40 (1). 1992. 61a.*
- Unrel** Toyama, S., Furuta, S., Miwa, M., Suzuki, M., Sano, H., and Matsuda, K. study on the metabolic fate of catena-s-mu-n-alpha-3-aminopropionylhistidinato-n-1 n-2 o n-tau-zinc 3rd communication. transfer into fetus and milk in rats. *Arzneimittel-Forschung. 41 (9). 1991. 984-991.*
- Unrel** Toyama, S., Furuta, S., Miwa, M., Suzuki, M., Sano, H., and Matsuda, K. study on the metabolic fate of catena-s-mu-n-alpha-3-aminopropionylhistidinato-n-1 n-2 o n-tau-zinc 2nd communication. absorption distribution metabolism and excretion after repeated administration to rats. *Arzneimittel-Forschung. 41 (9). 1991. 976-983.*
- Nut def** Toyoshima, Kuniaki and Shimamura, Akitatsu. a histochemical study of the gustatory epithelium in the circumvallate papilla of zinc-deficient rats. *Kyushu Shika Gakkai Zasshi (1990) 44(3): 514-18.*
- Gene** Trachtulec Zdenek(A), Mnukova-Fajeelova Monika, Hamvas Renata M J, Gregorova Sona, Mayer Werner E, Lehrach Hans R, Vincek Vladimir, Forejt Jiri, and Klein Jan. 1997. isolation of candidate hybrid sterility 1 genes by cDNA selection in a 1.1 megabase pair region on mouse chromosome 17. *Mammalian Genome 8(5): 312-316.*
- CP** Tracktenberg, E., Greve, C., Abbott, U., Buhr, R., Kenney, C., and Rucker, R. role of diet gonadectomy on the expression of scoliosis in a line of genetically susceptible chicks. *69TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ANAHEIM, CALIF., USA, APR. 21-26, 1985. FED PROC. 44 (3). 1985. 744.*
- Gene** Trainor, C. D., Omichinski, J. G., Vandergon, T. L., Gronenborn, A. M., Clore, G. M., and Felsenfeld, G. 1996. a palindromic regulatory site within vertebrate gata-1 promoters requires both zinc fingers of the gata-1 DNA-binding domain for high-affinity interaction. *Molecular and Cellular Biology 16(5): 2238-47.*
- Drug** Trammell, J. H., Isgrigg, W. N., and Davis, R. B. prevention of necrotic enteritis in broilers by feeding zinc bacitracin. *Poultry Science. 54 (5). 1975 1824*
- Unrel** Tran, C. D., Butler, R. N., Philcox, J. C., Rofe, A. M., Howarth, G. S., and Coyle, P. regional distribution of metallothionein and zinc in the mouse gut: comparison with metallothionein-null mice. *Biol. Trace Elem. Res. (1998) 63(3): 239-251.*
- CP** Tran Cuong(A), Butler, R. N(A), and Howarth, G. S. 1999. zinc in combination with a growth factor extract derived from bovine whey promotes recovery from methotrexate-induced small bowel damage in rats. *Gastroenterology 116(4 PART 2): A940.*
- CP** Tranque, P., Crossin, K. L., Cirelli, C., Edelman, G. M., and Mauro, V. P. 1996. identification and characterization of a ring zinc finger gene (c-rzf) expressed in chicken embryo cells. *Proceedings Of The National Academy Of Sciences Of The United States Of America. 93(7): 3105-3109.*

- Nut def** Trautvetter, E. Freie Univ. Berlin Germany F. R. Fachbereich Veterinaermedizin. Klinik und Poliklinik fuer Kleine Haustiere. 1987. [zinc deficiency disease in bullterriers]. <original> zinkmangelkrankung beim bullterrier. *Deutsche Veterinaermedizinische Gesellschaft E.V. - DVG-, Tagungsberichte.* P. 116
- Drug** Traves, Carmen, Camps, Laura, and Lopez-Tejero, Dolores. 1995. liver alcohol dehydrogenase activity and ethanol levels during chronic ethanol intake in pregnant rats and their offspring. *Pharmacol. Biochem. Behav.* 52(1): 93-9.
- No COC** Treacher, R. J., Stark, A. J., and Collis, K. A. the health and performance of cows fed large amounts of urea.
- In Vit** Treffry, A. and Harrison, P. M. spectroscopic studies on the binding of iron terbium and zinc by apo ferritin. *Journal of Inorganic Biochemistry.* 21 (1). 1984. 9-20.
- Nut** Trefny, D., Sova, Z., Petkov, S., Vodickova, H., Fukal, L., and Holoubek, J. 1990. the possibility of influencing the strumigenic action of rapeseed meal in fattened chickens and turkey poults by adding iodine and zinc to their diets. *Biologizace a Chemizace Zivocisne Vyroby, Veterinaria* 26(4-5): 293-302.
- FL** Trefny, D., Sova, Z., Petkov, S., Vodickova, H., Fukal, L., and Holoubek, J. possibility to influence the strumigenic action of rapeseed meal by the addition of iodine and zinc to diets given to fattened chickens and turkey poults. *Biologizace a Chemizace Zivocisne Vyroby - Veterinaria.* 26 (4-5). 1990. 293-302.
- No Oral** Tremblay, G. F., Matte, J. J., Girard, C. L., and Brisson, G. J. 1989. serum zinc, iron and copper status during early gestation in sows fed a folic acid-supplemented diet. *Journal of Animal Science* 67(3): 733-737.
- FL** Trentini, G. P., Ferrari de Gaetani, C., and Saviano, M. S. histological changes in morphology and enzymes in the rat adrenal gland in the presence and absence of zinc. *Boll. Soc. Ital. Biol. Sper.* (1969) 55(9): 607-10.
- FL** Trentini, G. P., Ferrari de Gaetani, C., and Saviano, M. S. 1969. [relations between zinc and growth and reproduction of the albino rat]. <original> rapporti dello zinco con l'accrescimento e la riproduzione del ratto albino. *Bollettino Della Societa Italiana Di Biologia Sperimentale* 45(9)
- Drug** Treuthardt, Jouko. 1992. hematology, antioxidative trace elements, the related enzyme activities and vitamin e in growing mink on normal and anemiogenic fish feeding. 144 P. V. 52 No. 4
- Unrel** Tribble Diane L(A), Barcellos-Hoff Mary Helen, Chu Berbie M, and Gong Elaine L. 1999. ionizing radiation accelerates aortic lesion formation in fat-fed mice via sod-inhibitable processes. *Arteriosclerosis Thrombosis and Vascular Biology* 19(6): 1387-1392.
- Unrel** Trindade, D. S., Cavaleiro, A. C. L., and Arnt, L. M. copper zinc and sulfur concentration of the native pasture in rio grande do sul state brazil. *Revista Da Sociedade Brasileira De Zootecnia.* 19 (6). 1990. 489-497.
- No Oral** TROITSKAYA, V. T. and GLADYSHEVA, O. S. 1994. relations between neurogenesis and electrical responses of olfactory receptors. *BIOFIZIKA;* 39(3): 543-547.
- Gene** Trompeter, H. I., Brand, I. A., and Soling, H. D. 1989. the primary sequence of the pfk-1 inactivating zinc-binding protein as deduced from cDNA sequencing - identity of the zinc-binding protein with rat parathymosin. *Febs Letters* 253(1-2): 63-66.

- Unrel** Trope, M., Lost, C., Schmitz, H. J., and Friedman, S. 1996. healing of apical periodontitis in dogs after apicoectomy and retrofilling with various filling materials. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and*
- Phys** Tros, G. H. J., Van Langevelde, F., and Vis, R. D. 1990. on the analysis of neonatal hamster tooth germs with the photon microprobe at daresbury, uk. *Nucl. Instrum. Methods Phys. Res. Sect. B* B50(1-4): 343-6.
- No Oral** Troskot, B., Simicevic, V. N., Dodig, M., Rotkvic, I., Ivankovic, D., and Duvnjak, M. the protective effect of zinc sulfate pretreatment against duodenal ulcers in the rat. *BioMetals* (1997) 10(4): 325-329.
- Drug** Troskot B(A), Simicevic, V. N., Dodig, M., Rotkvic, I., Ivankovic, D., and Duvnjak, M. 1997. the protective effect of zinc sulphate pretreatment against duodenal ulcers in the rat. *Biometals* 10(4): 325-329.
- Alt** Trotskot, Branko, Simicevic, Velmir N., Dodig, Milan, Rotkvic, Ivoc, Ivankovic, Davor, and Duvnjak, Marko. endogenous zinc concentrations in cysteamine-induced duodenal ulcers in the rat. *BioMetals* (1996) 9(4): 371-375.
- No COC** Troy, C. M., Derossi, D., Prochiantz, A., Greene, L. A., and Shelanski, M. L. 1996. downregulation of cu/zn superoxide dismutase leads to cell death via the nitric oxide-peroxynitrite pathway. *Vol. 16, No. 1, Pp. 253-261* J. Neurosci.
- CP** Troy Carol M and Shelanski Michael L. 1994. down-regulation of copper/zinc superoxide dismutase causes apoptotic death in pc12 neuronal cells. *Proceedings of the National Academy of Sciences of the United States of America* 91(14): 6384-6387.
- CP** Troy Carol M(A), Stefanis Leonidas, Prochiantz Alain, Greene Lloyd A, and Shelanski Michael L. 1996. the contrasting roles of ice family proteases and interleukin-1-beta in apoptosis induced by trophic factor withdrawal and by copper/zinc superoxide dismutase down-regulation. *Proceedings of the National Academy of Sciences of the United States of America* 93(11): 5635-5640.
- Surv** Trust, K. A., Rummel, K. T., Scheuhammer, A. M., Brisbin, I. L. Jr., and Hooper, M. J. contaminant exposure and biomarker responses in spectacled eiders (*somateria fischeri*) from st. lawrence island, alaska. *Arch. Environ. Contam. Toxicol.* (2000) 38(1): 107-113.
- No Oral** Tryphonas, L., Hidioglou, M., and Collins, B. 1979. reversal by testosterone of atrophy of accessory genital glands of castrated male sheep. a histologic and morphometric study. *Veterinary Pathology* 16(6): 710-721.
- CP** Tsai, C. M. E. and Evans, J. L. influence of dietary ascorbic-acid and copper on tissue trace elements cholesterol and hemo globin. *Proceedings of University of Missouri's Annual Conference on Trace Substances in Environmental Health.* 9. 1975 (Recd 1976) 441-449
- CP** Tsai, C. Y. and Lei, K. Y. 1978. dietary fiber, zinc and copper: effects on tissue mineral levels in rats. *Federation Proceedings* 37(3): 542.
- Nut** Tsai, Jin-Lian, Lee, Jian-Fu, Lee, Hsin-Chen, Lee, Chia-Hsiang, Huang, Jiun-Yu, and Wei, Yau-Huei. effect of zinc supplement in ethanol diet on rat liver mitochondrial respiration and oxidative phosphorylation. *J. Chin. Biochem. Soc.* (1994) 23(1): 43-52.
- Nut def** Tsai, R. C. Y. and Lei, K. Y. 1979. dietary cellulose, zinc and copper: effects on tissue levels of trace minerals in the rat. *J. Nutr.* 109(6): 1117-22.

- No COC** Tsai, S., Martin, D. I. K., Zon, L. I., D'Andrea, A. D., Wong, G. G., and Orkin, S. H. 1989. cloning of cDNA for the major DNA-binding protein of the erythroid lineage through expression in mammalian cells. *Nature, UK* 339(6224): 446-451.
- Phys** Tsang, A. P., Visvader, J. E., Turner, C. A., Fujiwara, Y., Yu, C., Weiss, M. J., Crossley, M., and Orkin, S. H. 1997. fog, a multitype zinc finger protein, acts as a cofactor for transcription factor gata-1 in erythroid and megakaryocytic differentiation. *Vol. 90, No. 1, Pp. 109-119* *Cell*
- CP** Tsang, A. P(A), Fujiwara, Y., Hom, D. B., and Orkin, S. H. 1997. the gata-1 cofactor fog (friend of gata-1) is essential for normal erythroid differentiation and megakaryocyte development. *Blood* 90(10 SUPPL. 1 PART 1): 575A.
- No Oral** TSENG, C. C., CHANG, E. E., CHENG, H. S., and LIU, H. J. effect of escherichia coli free-endotoxin on zinc uptake in rats. *J CHIN BIOCHEM SOC; 19 (2). 1990. 100-108.*
- No COC** Tseng, H. C., Chen, L. M., and Yang, C. P. 1980. residues of antibiotic feed additives in the tissues of broilers fed on the levels of growth promotion and disease prevention. *No. 112, Pp. 44-53* *J. Agric. Assoc. China.*
- No Dose** Tseng, Hay-Tay. zinc phosphide, a new rat control agent recommended by tsc [taiwan sugar corporation]. *Taiwan Sugar (1972)* 19(5): 172.
- Phys** Tseng Hung, Matsuzaki Kyoichi, and Lavker Robert M(A). 1999. basonuclin in murine corneal and lens epithelia correlates with cellular maturation and proliferative ability. *Differentiation* 65(4): 221-227.
- No COC** Tsinas, A. C., Kyriakis, S. C., Lekkas, S., Sarris, K., Bourtzi-Hatzopoulou, E., and Saoulidis, K. 1998. control of proliferative enteropathy in growing/fattening pigs using growth promoters. *Journal of Veterinary Medicine. Series B* 45(2): 115-127.
- No Oral** Tsuchiya, Hironobu, Shima, Shogo, Kurita, Hideki, Ito, Tetsuya, Kato, Yukihisa, Kato, Yasuo, and Tachikawa, Sohichi. effects of maternal exposure to six heavy metals on fetal development. *Bull. Environ. Contam. Toxicol. (1987)* 38(4): 580-7.
- FL** Tsujimura, I. a histo pathological study of pulp response to 3 kinds of tannin fluoride cement in dogs cavities. *Shikwa Gakuho.* 83 (7). 1983. 891-935.
- FL** Tsukui, T. experimental studies on zinc and copper intake and contents in various tissues and wound healing. *Shinshu Medical Journal.* 36 (3). 1988. 351-367.
- FL** Tsukui, Toshiro. effects of zinc and copper intake on various tissues and wound healing in rats. *Shinshu Igaku Zasshi (1988)* 36(3): 351-67.
- In Vit** Tsuzuike, N., Segawa, Y., Tagashira, E., and Yamaguchi, M. 1993. beta-alanyl-L-histidinato zinc enhances various bone-regulating factors' effects on bone alkaline phosphatase activity in tissue culture. *Pharmacology* 47(1): 66-72.
- Nut** Tsyupko, V. V., Antipin, S. L., and Bogdanova, I. N. 1990. effect of mineral supplementation of diets on digestibility of nutrients in the digestive tract of bull calves. *Sel'Skokhozyaistvennaya Biologiya* (6): 84-89.
- Unrel** TU, A. T. hemorrhagic and necrotic toxins in snake venoms. *Crisp Data Base National Institutes Of Health*
- Drug** Tuer, Xunjiang, Zheng, Yupei, Zhu, Ming, Yang, Xiaoyi, and Wu, Jianmin. delayed type

hypersensitivity of mice under different nutritional status. *Yingyang Xuebao* (1997) 19(4): 393-395.

- CP** TUFFT, L. and NOCKELS, C. F. 1988-1989. the effect of dietary edta on trace element kinetics in chicks. *72ND ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY*
- Alt** Tuitoek, Prisca, Lakey, Jonathan, Rajotte, Ray, Ziari, Shahed, Tsin, Andrew, and Basu, Tapan. effect of insulin treatment or zinc supplementation on vitamin a status in streptozotocin-induced diabetic rats. *J. Clin. Biochem. Nutr.* (1995) 19(3): 165-173.
- Gene** Tull-Singleton, S., Kimball, S., and Mcbee K(A). 1994. correlative analysis of heavy metal bioconcentration and genetic damage in white-footed mice (*peromyscus leucopus*) from a hazardous waste site. *Bulletin of Environmental Contamination and Toxicology* 52(5): 667-672.
- In Vit** Tulsi, R. S., Harding, A. J., Joschko, M. A., and Dreosti, I. E. 1992. a quantitative and morphological study of ectodermal microvilli in ten areas in the control and experimental prenatal rat. *Teratology* 45(1): 83-90.
- Mix** Tunn, U., Senge, T., Schenck, B., and Neumann, F. 1980. effects of cyproterone acetate on experimentally induced canine prostatic hyperplasia. a morphological and histochemical study. *Urologia Internationalis* 35(2): 125-40.
- No Oral** Turan, B., Delibasi, E., Sinav, B., and Akkas, N. zinc-calcium interaction in heparin-induced osteoporotic rabbit plasma. *Trace Elem. Electrolytes* (1996) 13(3): 138-142.
- Nut** Turan, Belma, Dalay, Nejat, Afrasyap, Lale, Delilbasi, Ertan, Sengun, Zeynep, Sayal, Ahmet, and Isimer, Askin. the effects of selenium supplementation on antioxidative enzyme activities and plasma and erythrocyte selenium levels. *Acta Physiol. Hung.* (1993) 81(1): 87-93.
- Drug** Turan, Belma, Zaloglu, Nezahat, Koc, Emine, Saran, Yuksel, and Akkas, Nuri. dietary selenium- and vitamin e-induced alterations in some rabbit tissues. *Biol. Trace Elem. Res.* (1997) 58(3): 237-253.
- Alt** Turgeon, S. M. and Albin, R. L. postnatal ontogeny of gabab binding in rat brain. *Neuroscience (Oxford)* (1994) 62(2): 601-13.
- Phys** Turgeon Sarah M and Albin Roger L(A). 1994. gaba-b binding sites in early adult and aging rat brain. *Neurobiology of Aging* 15(6): 705-711.
- Drug** Turk, D. E. dietary antibiotics metab and the absorption of zinc-65 and iodine-131 labeled oleic-acid chlortetracycline metab oxytetracycline metab erythromycin metab bacitracin metab soy bean-d corn-m. *POULTRY SCI.* 47 (6). 1768-1771. 1968.
- Unrel** Turk, D. E. 1974. intestinal parasitism and nutrient absorption. *Federation Proceedings* 33(1): 106-11.
- Drug** Turk, Donald E. and Stephens, James Fred. 1970. eimeria necatrix and zinc absorption in the chick: effect of sulfaquinoxaline treatment of the infection. *Poultry Sci.* 49(1): 285-9.
- Alt** Turk, Donald E. and Stephens, James Fred. 1967. upper intestinal tract infection produced by e[imeria] acervulina and absorption of zinc-65 and iodine-131 labeled oleic acid. *J. Nutr.* 93(2): 161-5.

- Unrel** Turnbull, A. J., Blakeborough, P., and Thompson, R. P. H. Gastrointestinal Laboratory Rayne Institute St Thomas' Hospital London SE1 7EH United Kingdom. 1990 . the effects of dietary ligands on zinc uptake at the porcine intestinal brush-border membrane. *British Journal of Nutrition*. V. 64(3) P. 733-741
- No Oral** Turnbull, Alastair J., Wood, Richard J., and Russell, Robert M. hypochlorhydria does not inhibit zinc absorption in the rat. *Nutr. Res. (N. Y.)* (1992) 12(8): 999-1008.
- No COC** Turner, A. J. and Tanzawa, K. 1997. mammalian membrane metallopeptidases: nep, ece, kell, and pex. *FASEB Journal* 11(5): 355-64.
- No COC** Turner, C. W. 1971. hormones influencing intensity of milk secretion in the rat. <Document Title>Research Bulletin, Agricultural Experiment Station, University of Missouri (982): 30pp.
- Surv** Turner, J. C., Solly, S. R. B., Mol-Krijnen, J. C. M., and Shanks, V. 1978. organochlorine, fluorine, and heavy-metal levels in some birds from newzealand estuaries. *New Zealand Journal of Science* 21(1): 99-102.
- CP** Turner, T. Y., Goodman, C. B., and Soliman, M. R. I. 1998. effects of zinc on spatial reference memory and brain dopamine (d1) receptor binding kinetics in rats. *Society for Neuroscience Abstracts* 24(1-2): 2127.
- Nut def** Turnlund, J., Franz, K., and Margen, S. effect of prednisolone on bone in zinc deficient rats. *Federation Proceedings*. 37 (3). 1978 584
- Nut def** Turnlund, Judith and Margen, Sheldon. effect of glucocorticoids and zinc deficiency on femur and liver zinc in rats. *J. Nutr.* (1979) 109(3): 467-72.
- Abstract** TWABUCHI, Y. and MASUHARA, T. 1980. protective effect of zinc against testicular injury by cadmium effect of zinc on the behavior of cadmium in blood. 53RD GENERAL MEETING OF THE JAPANESE PHARMACOLOGICAL SOCIETY
- Drug** Twedt, D. C., Hunsaker, H. A., and Allen, K. G. 1988. use of 2,3,2-tetramine as a hepatic copper chelating agent for treatment of copper hepatotoxicosis in bedlington terriers. *Journal of the American Veterinary Medical Association* 192(1): 52-6.
- Not Prim** U-Freising-Weihenstephan, German Federal Republic. 1978. homeostatic adaptation of zn absorption and endogenous zn excretion over a wide range of dietary zn supply. <Document Title>Trace Element Metabolism in Man and Animals - 3. | : 106-109.
- FL** Ubaldi, A., Fusari, A. Parma Univ. Italy Istituto di Biochimica, Tassinari, M., and Berlese, M. Bologna Univ. Italy Istituto di Zootecnia e Nutrizione Animale. 1993. dl-carnitine and zinc proteinate in veal diet. 2: metabolic investigations. <original> impiego di dl-carnitina e di zinco proteinato nell'alimentazione del vitello "a carne bianca". 2: indagini ematochimiche. *Atti Della Societa Italiana Delle Scienze Veterinarie*. V. 47(Pt.3) P. 1773-1777
- CP** Ucar, D. A., Tocco, R. J., and Kluger, M. J. 1983. circadian variation in circulating pyrogen: possible role in resistance to infection. *Proceedings of the Society for Experimental Biology and Medicine*; 173
- CP** Uchida, K., Hanai, S., Ishikawa, K., Ozawa, Y., Uchida, M., Sugimura, T., and Miwa, M. 1993. cloning of cDNA encoding drosophila poly(adp-ribose) polymerase: leucine zipper in the auto-modification domain. *Proceedings Of The National Academy Of Sciences Of The United States Of America*. 90(8): 3481-3485.

- Alt** Uchida, Yoshiko, Moon-Fanelli, Alice A., Dodman, Nicholas H., Clegg, Michael S., and Keen, Carl L. serum concentrations of zinc and copper in bull terriers with lethal acrodermatitis and tail-chasing behavior. *Am. J. Vet. Res.* (1997) 58(8): 808-810.
- BioAcc** Uchino, Eiji, Tsuzuki, Toshihumi, Inoue, Katsuhiro, and Kishi, Reiko. concentration of iron, copper, zinc and lead in three tissues of young (22 days old) and adult (290 days old) rats. *Hokkaidoritsu Eisei Kenkyushoho* (1981) (31): 117-18 .
- Drug** Udoh, A. E., Opara, C. A., Ekanemessang, U. M., Eka, O. U., and Ebong, P. E. effects of pyrimethamine on serum alkaline phosphatase and some bone mineral composition of young rats. *Discovery Innovation* (1994) 6(4): 421-6 .
- CP** Udomkesmallee, E., Ferre, H., Lovich, Susan, McAdam, K. P. W. J., and Solomons, N. W. 1985. zinc deficiency in the c3h mouse : serum alkaline phosphatase and other indexes of zinc nutriture. *Trace Elem. Man Anim. -- TEMA 5 Proc. Int. Symp., 5th* : Meeting Date 1984, 590-3. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK..
- HHE** Ueda, F., Seki, H., Fujiwara, H., Ebara, K., Minomiya, S., and Shimaki, Y. 1987 . interacting effects of zinc and cadmium on the cadmium distribution in the mouse. *Veterinary and Human Toxicology* 29(5): 367-72.
- No Oral** Ueda, Fukiko, Seki, Hiroo, Fujiwara, Harumi, Ebara, Kayoko, Minomiya, Shigeru, and Shimaki, Yasuie. interacting effects of zinc and cadmium on the cadmium distribution in the mouse. *Vet. Hum. Toxicol.* (1987) 29(5): 367-72.
- Nut def** Ueda, Hiroshi, Kayama, Fujio, Mori, Naoki, Doi, Yoshiaki, and Fujimoto, Sunao. effects of dietary zinc deficiency on protein secretory functions of the mouse testis. *Arch. Histol. Cytol.* (1991) 54(4): 401-10.
- Nut def** Uehara, M., Yamagishi, H., and Goto, S. the effects of dietary iron and copper levels on the subcellular distribution of the trace elements in rat liver. *Biomed. Res. Trace Elem.* (1991) 2(2): 187-8.
- Nut def** Uehara, Mariko, Endo, Yukie, Mowlah, Golam, Suzuki, Kazuharu, and Goto, Shiro. effects of egg on iron-deficient rats. *Nutr. Rep. Int.* (1987) 35(5): 1023-34.
- Nut** Uehara, Mariko, Suzuki, Kazuharu, and Goto, Shiro. the effects of dietary phosphorus and magnesium levels on iron, copper and zinc utilization in rats. *Maguneshumu (Kyoto)* (1992) 11(2): 145-53.
- Unrel** Uenishi, K., Horio, H., Manabe, S., and Sakamoto, S. 1993. effect of dietary proteins on zinc bioavailability in pregnant rats. *Tokushima Journal of Experimental Medicine* 40(3-4): 147-58.
- Carcin** Ujiie, S., Mimata, Y., Okuno, M., and Wakui, A. 1989. [experimental studies on the antitumor effect of progesterone and enhancement of the therapeutic effect of anticancer drugs by progesterone--from the aspect of zinc metabolism]. *Gan to Kagaku Ryoho* 16(7): 2423-8.
- Nut** Ullrey, D. E., Allen, M. E., and Baer, D. J. 1991. formulated diets versus seed mixtures for psittacines. *Journal of Nutrition* 121(11S): S193-S205.
- FL** Ulrich, K. acute poisonings in small domestic animals. *Prakt. Tierarzt* 51(13): 620-623; 1970
- Food** Umoren, J. and Kies, C. 1992. commercial soybean starch blocker consumption: impact on weight gain and on copper, lead and zinc status of rats. *Plant Foods Hum. Nutr. (Dordrecht Neth.)* 42(2): 135-42.

- FL** Unanian, M. M. and Silva, A. E. D. F. 1986. [relationship between physiological state and breed and biochemical values of goat blood in the semi-arid northeast, 3: zinc and copper]. <original> valores bioquimicos no soro de cabras relacionadas ao estado fisiologico e raca, no nordeste semi-arido, 3: zinco e cobre. *Pesquisa Agropecuaria Brasileira*. 21(5): 541-546.
- Surv** Unanian, M. M. and Silva, A. E. D. F. 1989. studies relating subnutrition to goat abortion in the northeastern region of brazil. *Pesquisa Agropecuaria Brasileira*. 24(10): 1221-1228.
- FL** Unanian, M. M., Silva, A. E. D. F., and Dode, M. A. N. 1991. zinc levels in seminal plasma and blood serum of pubescent nelore cattle, in relation with sperm characteristics and reproductive development. <original> valores de zinco no plasma seminal e soro sanguineo de bovinos puberes da raca nelore relacionados as caracteristicas espermaticas e desenvolvimento reprodutivo. *Pesquisa Agropecuaria Brasileira*. V. 26(4) P. 597-604
- Surv** Unanian, M. M., Silva, A. E. D. F., and Manzano, A. 1999. study of biochemical parameters in pregnant pure-bred arabian mares. *Brazilian Archives of Biology and Technology* 42(1): 107-114.
- Nut** Unanian Maria Marina(A), Lepera Jose Salvador, and Pereira Amilton Castro. 1994. chemical composition of mare's colostrum. *Arquivos De Biologia e Tecnologia (Curitiba)* 37(4): 981-987.
- Plant** UNDERSANDER, D. J. 1985. effect of nitrification inhibitor on nutrient composition of winter wheat triticum-aestivum forage. *J PLANT NUTR*; 8(11): 977-988.
- Unrel** Underwood, E. J. 1976. mineral imbalances in farm animals and their study and diagnosis with isotopic tracers. *Atomic Energy Review* 14(4): 591-619.
- Rev** Underwood, E. J. 1981.: ix + 180pp.
- Nut def** Underwood, E. J. and Somers, M. 1969. studies of zinc nutrition in sheep 1 the relation of zinc to growth testicular development and spermatogenesis in young rams. *AUST J AGR RES*. 20(5): 889-897.
- Abstract** Untawale, G. G. and McGinnis, J. 1976. effects of dietary antibiotic supplements on mortality of chicks fed diets containing raw beans. *Poultry Science*. 55 (5): 2101
- Alt** Urban, E. and Campbell, M. E. 1984. in vivo zinc transport by rat small intestine after extensive small bowel resection. *American Journal of Physiology* 247(1 Pt 1): G88-94.
- Alt** Urban, Ernest and Campbell, Mary Ellen. in vivo zinc transport by rat small intestine after extensive small bowel resection. *Am. J. Physiol.* (1984) 247(1, Pt. 1): G88-G94 .
- No COC** Urbanczyk, J., Rys, R., Hanczakowska, E., and Harenza, T. growth promoters in fattening of pigs. *ACTA AGRAR SILVESTRIA SER ZOOTECH. Acta Agraria Et Silvestria Series Zootechnia*. 18 (1-2). 1979 (Recd. 1980). 147-160.
- FL** Urbanczyk, J., Rys, R., Harenza, R., and Hanczakowska, E. 1975. experimental assessment of the effects of cu and zn on the efficacy of nitrovin in feeding pigs. *Medycyna Weterynaryjna* 31(9): 547-549.
- Org Met** Uresk, D. USFA Forest Service Rapid City SD. relation of black-tailed prairie dogs and control programs to. *FWS Biol Report* 13. P8(1)
- Alt** Urga, Kelbessa, Narasimha, H. V., Sasikala, B. V., and Vishwanatha, S. bioavailability of iron

and zinc from tef in rats. *Bull. Chem. Soc. Ethiop.* (1998) 12(2): 95-103 .

- Prim** Uriu-Hare, J., Keen, C. L., Lonnerdal, B., Oteiza, P., Golub, M. S., and Gershwin, M. E. influence of marginal maternal zinc deprivation on infant development in rhesus monkeys. 73RD ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, NEW ORLEANS, LOUISIANA, USA, MARCH 19-23, 1989. FASEB (FED AM SOC EXP BIOL) J. 3 (4). 1989. A1078.
- Abstract** Uriu-Hare, J. Y., Oster, M. H., Stern, J. S., and Keen, C. L. tissue trace element accumulation with diabetes is independent of dietary mineral intake. 72ND ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, LAS VEGAS, NEVADA, USA, MAY 1-5, 1988. FASEB (FED AM SOC EXP BIOL) J. 2 (4). 1988. Abstract 1964.
- Alt** Uriu-Hare, J. Y., Stern, J. S., and Keen, C. L. 1989. influence of maternal dietary zn intake on expression of diabetes- induced teratogenicity in rats. *Diabetes*. 38(10): 1282-90.
- Phys** Uriu-Hare, J. Y., Walter, R. M. Jr., and Keen, C. L. 1992. 65zinc metabolism is altered during diabetic pregnancy in rats. *The Journal Of Nutrition*. 122(10): 1988-1998.
- Unrel** Uriu-Hare Janet Y(A), Walter Robert M Jr, and Keen Carl L. 1992. zinc-65 metabolism is altered during diabetic pregnancy in rats. *Journal of Nutrition* 122(10): 1988-1998.
- CP** Uriuhare, J. Y., Stern, J. S., and Keen, C. L. 1987. dietary zinc reduces the expression of diabetes-induced teratogenicity in the rat. *Federation Proceedings* 46: 595.
- Abstract** Uriuhare, J. Y., Stern, J. S., and Keen, C. L. 1987. effects of maternal dietary zinc on the expression of diabetes-induced teratogenicity in the rat. *Teratology* 35: A62-A63.
- No Dose** Usuki, F., Ishiura, S., and Sugita, H. 1986. developmental study of alpha-glucosidases in japanese quails with acid maltase deficiency. *Muscle & Nerve* 9(6): 537-43.
- CP** Uthus, E. O. and Neilsen, F. H. 1983. zinc status affects the induction of arsenic deficiency in chicks. 67TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, CHICAGO, ILL., USA, APRIL 10-15, 1983. FED PROC. 42 (4). 1983. Abstract 3108.
- CP** Uthus, E. O. and Nielsen, F. H. 1980. arsenic deprivation and arsenic-zinc interactions in the chick. *Spurenelem.-Symp.: Arsen 3rd* : 33-9. Editor(s): Anke, Manfred; Schneider, Hans-Joachim; Brueckner, Chr. Publisher: Friedrich-Schiller- Univ. Jena Abt. Wiss. Publ., Jena, Ger. Dem. Rep.
- CP** Uthus, E. O. and Nielsen, F. H. arsenic-zinc interactions in chicks. *Proc. N. D. Acad. Sci.* (1980) : 34, 54
- CP** Uthus, E. O. and Nielsen, F. H. 1983. influence of arsenic on arginine metabolism in chicks . *Spurenelem.-Symp. 4th* : 105-10. Editor(s): Anke, Manfred. Publisher: Friedrich-Schiller-Univ., Jena, Ger. Dem. Rep.
- Nut** Uthus, Eric O. and Nielsen, Forrest H. 1985. effects in chicks of arsenic, arginine, and zinc and their interaction on body weight, plasma uric acid, plasma urea, and kidney arginase activity. *Biol. Trace Elem. Res.* 7(1): 11-20 .
- FL** Uyanik, F., Liman, B. C., and Liman, N. 1999. the effects of danofloxacin on some biochemical parameters and liver inbroilers. *Turk Veterinerlik Ve Hayvancilik Dergisi* 23(Supplement 4):

757-764.

- Bio Acc** Uzieblo, L., Ligocki, M., Hapanowicz, B., and Romaniszyn, K. 1993. heavy metals and fluorine content of hen's eggs derived from different place of origin. *Vol. 26, No. 2, Pp. 91-96* Bromatol. Chem. Toksykol.
- No COC** Vahouny, George V., Khalafi, Reza, Satchithanandam, Subramanian, Watkins, Don W., Story, Jon A., Cassidy, Marie M., and Kritchevsky, David. dietary fiber supplementation and fecal bile acids, neutral steroids and divalent cations in rats. *J. Nutr. (1987) 117(12): 2009-15 .*
- Unrel** Vaisberg, C., Cheshmedjieva, S., Miteva, K., Pironcheva G(A), and Russev, G. 1999. distribution of zinc and magnesium in buffalo, bull and ram semen and effect of cold shock. *Biomedical Letters 60(234): 47-53.*
- FL** Vajda, V. Univerzita Veterinarskeho Lekarstva Kosice Slovak Republic. 1998. phase nutrition of calves with acidified milk drink. 1. feed consumption, growth intensity and metabolic parameters of the blood serum according to growth phases. <original> fazova vyživa teliat acidifikovaným mliečnym napojom. 1. spotreba krmiva, intenzita rastu a metabolicke ukazovatele krvneho sera podľa rastových faz. *Slovensky Veterinarsky Casopis. <Subtitle>Slovak Veterinary Journal. V. 23(1) P. 36-41*
- FL** Val'dman, A. R., Basova, N. A., Tarvid, I. L., and Strozha, I. K. 1987. peptide hydrolysis and absorption of amino acids in relation to vitmaina availability in the diets for birds. *Doklady Vsesoyuznoi Akademii Sel'Skokhozyaistvennykh Nauk (11): 38-41.*
- FL** Val'dman, A. R. and Dvinskaya, L. M. 1985. biological aspects of vitamin nutrition in farm animals. *Izvestiya Akademii Nauk Latvviiskoi SSR (3): 76-81.*
- FL** Val'dman, A. R., Strozha, I. K., Apsite, M. R., Atlavin, A. B., Basova, N. A., Berzin', N. I., Kalntsiema, V. Kh., Ozol, A. Ya., and Vevere, L. K. 1982. antioxidants in nutrition of vitamin a-surfeited chickens. <Document Title>Biokhimiya Vsasyvaniya Pitatel'Nyk Veshchestv Uzhivotnykh. 7-17.
- In Vit** Valberg, Leslie S., Card, Robert T., Paulson, Eleanor J., and Szivek, J. alterations in cellular sodium, potassium, calcium, magnesium, copper, and zinc levels during the development and maturation of erythrocytes in the rabbit. *Br. J. Haematol. (1967) 13(1): 115-25 .*
- Bio Acc** Valdes, J. J., Hartwell, S. W., Sato, S. M., and Frazier, J. M. 1982. lateralization of zinc in rat brain and its relationship to a spatial behavior. *Pharmacology, Biochemistry, and Behavior 16(6): 915-7.*
- No Dose** Valdes, James J., Hartwell, Sara W., Sato, Sheryl M., and Frazier, John M. 1982. lateralization of zinc in rat brain and its relationship to a spatial behavior. *Pharmacol. Biochem. Behav. 16(6): 915-17 .*
- Drug** Valdes, M., Shaye, R., Joseph, F. Jr., and Nakamoto, Tetsuo. the effects of caffeine on the maxillary composition in the newborn rat. *Calcif. Tissue Int. (1992) 50(2): 165-8*
- Unrel** Vallier, H. A., Rodgers, P. A., Castillo, R. O., and Stevenson, D. K. absorption of zinc deuteroporphyrin ix 2 4-bisglycol by the neonatal rat small intestine in-vivo. *DEV PHARMACOL THER. Developmental Pharmacology and Therapeutics. 17 (1-2). 1991 (1992). 109-115.*
- Fate** Van, Barneveld A A and Van Den Hamer C J A. influence of isotope administration mode and of food consumption on absorption and retention of zinc-65 in mice. *Nutrition Reports*

International. 31 (4). 1985. 887-894.

- Bio Acc** Van Campen, D. R. 1966. effects of zinc, cadmium, silver and mercury on the absorption and distribution of copper-64 in rats. *J.Nutr.* 88(1): 125-130.
- Nut def** Van Campen, Darrell and House, W. A. 1974. effect of a low-protein diet on retention of an oral dose of zinc-65 and on tissue concentrations of zinc, iron, and copper in rats. *J. Nutr.* 104(1): 84-90 .
- CP** VAN, D. E. N. ABBEEL E, VITRIER, S., LEBRUN, F., and VAN STEIRTEGHEM A. 1999. optimized mouse bioassays for the detection of embryology contaminants. *15TH ANNUAL MEETING OF THE EUROPEAN SOCIETY OF HUMAN REPRODUCTION AND EMBRYOLOGY AND THE ANNUAL MEETING OF THE FEDERATION FRANCAISE POUR L'ETUDE DE LA REPRODUCTION*
- In Vit** Van den Berg, G. B., Vaandrager-Verduin, H., Van Berkel, T. J., and Koster, J. F. 1982. hysteretic behavior of rat liver fructose 1,6-bisphosphatase induced by zinc ions. *Archives of Biochemistry and Biophysics* 219(2): 277-85.
- In Vit** Van den Berg, Gerard B., Vaandrager-Verduin, Hedwig, Van Berkel, Theo J. C., and Koster, Johan F. hysteretic behavior of rat liver fructose 1,6-bisphosphatase induced by zinc ions. *Arch. Biochem. Biophys.* (1982) 219(2): 277-85.
- Drug** van den Broek, A. H. and Simpson, J. W. 1992. fat absorption in dogs with demodicosis or zinc-responsive dermatosis. *Research in Veterinary Science* 52(1): 117-9.
- Nut def** Van Den Broek A H M and Stafford, W. L. diagnostic value of zinc concentrations in serum leukocytes and hair of dogs with zinc-responsive dermatosis. *RES VET SCI. Research in Veterinary Science. 44 (1). 1988. 41-44.*
- Nut** van der Aar, P. J., Fahey, G. C. Jr, Ricke, S. C., Allen, S. E., and Berger, L. L. 1983. effects of dietary fibers on mineral status of chicks. *Journal of Nutrition* 113(3): 653-61.
- CP** Van Der Wal W A A, Van Wouwe J P, Marx, J. J. M., and Van Asbeck B S. effect of zinc on survival of neonatal rats in hyperoxia limiting factor for superoxide dismutase activity. *JOINT MEETING OF THE ASSOCIATION OF AMERICAN PHYSICIANS, THE AMERICAN SOCIETY FOR CLINICAL INVESTIGATION, AND THE AMERICAN FEDERATION FOR CLINICAL RESEARCH, SEATTLE, WASHINGTON, USA, MAY 3-6, 1991. CLIN RES. 39 (2). 1991. 387a.*
- Dead** van der Zee J, Zwart P, and Schotman A J H. 1985. zinc poisoning in a nicobar pigeon. *JOURNAL OF ZOO ANIMAL MEDICINE* 16. 122(2): 68-69, illustr.
- Abstract** Van, Eeckhout M, Varani, J., Pekarek, R., and Kelleher, J. J. 1976. effects of nutritional deficiency on herpes simplex virus infection in mice. *Proceedings of the North Dakota Academy of Science.* 30(1): 47.
- Nut def** Van Herck, H., Van Wouwe, J. P., Veldhuizen, M., Baumans, V., Stafleu, F. R., and Beynen, A. C. 1989. clinical examination of weanling rats with early zinc deficiency. *Laboratory Animals* 23(4): 328-32.
- Abstract** Van Heugten E, Spears, J. W., Qureshi, M. A., Kegley, E. B., and Ward, J. D. 1995. immunity and growth of weanling pigs fed different sources of zinc. *Journal of Animal Science* 73(SUPPL. 1): 186.
- Nut def** Van Houwelingen, F., Van den Berg, G. J., Lemmens, A. G., Sijsma, K. W., and Beynen, A. C.

iron and zinc status in rats with diet -induced marginal deficiency of vitamin a and/or copper. *Biol. Trace Elem. Res.* (1993) 38(1): 83-95.

- Unrel** van Leengoed, H. L., van der Veen, N., Versteeg, A. A., Ouellet, R., van Lier, J. E., and Star, W. M. 1993. in vivo photodynamic effects of phthalocyanines in a skin-fold observation chamber model: role of central metal ion and degree of sulfonation. *Photochemistry and Photobiology* 58(4): 575-80.
- Bact** VanLeengoed L A M G and Kamp, E. M. 1989. endobronchial inoculation of various doses of haemophilus-pleuropneumoniae in pigs. *American Journal of Veterinary Research.* 50(12): 2054-2059.
- Aquatic** Van Leeuwen, C. J., Grootelaar, E. M. M., and Niebeek, G. fish embryos as teratogenicity screens: a comparison of embryotoxicity between fish and birds. *Ecotoxicol. Environ. Saf.* (1990) 20(1): 42-52.
- Nut def** Van Niekerk F E and Van Niekerk C H. effect of high levels of dietary molybdenum and sulfate on south africa mutton merino sheep i. mineral status and hematological parameters. *Suid-Afrikaanse Tydskrif Vir Veekunde.* 19 (3). 1989. 107-113.
- No Oral** Van Rensburg, Schalk J., Hall, Jane M., and Du Bruyn, Du B. 1985. effects of various dietary staples on esophageal carcinogenesis induced in rats by subcutaneously administered n-nitrosomethylbenzylamine. *J. Natl. Cancer Inst.* 75(3): 561-6.
- No Control** Van Ryssen J B J. 1994. the effectiveness of using supplementary zinc and molybdenum to reduce the copper content in the liver of hypercuprotic sheep. *Journal of the South African Veterinary Association* 65(2): 59-63.
- FL** van Veen, L. 1999. [aortic rupture in poultry: a review]. <original> aortaruptuur bij pluimvee: een overzicht. *Tijdschrift Voor Diergeneeskunde* 124(8): 244-7.
- Mix** Van Vleet, J. F. 1982. amounts of 8 combined elements required to induce selenium vitamin e deficiency in ducklings and protection by supplements of selenium and vitamin e. *AM J VET RES.* 43(6): 1049-1055.
- Mix** Van Vleet, J. F. 1982. amounts of twelve elements required to induce selenium vitamin e deficiency in ducklings. *Am. J. Vet. Res.* 43(5): 851-857.
- Nut def** Van Wouwe, J. P., Hoogenkamp, S., and Van den Hamer, C. J. 1989. histidine supplement and zn status in swiss random mice. *Biological Trace Element Research* 22(1): 35-43.
- No Oral** Van Wouwe, J. P., Veldhuizen, M., Uylenbroek, J. J. M., Van den Hamer, C. J. A., and Van Gelderen, H. H. changes in zinc homeostasis caused by endotoxin and nutritional zinc deficiency. *Spec. Publ. - R. Soc. Chem.* (1989) 72(Nutr. Availability: Chem. Biol. Aspects): 232-4
- CP** Van Wouwe J P, Veldhuizen, M., and Van Den Hamer C J A. oral zinc-65 loading test in rats fed iri-ob diet with various zinc concentrations. *BEYNEN, A. C. AND H. A. SOLLEVELD (ED.). NEW DEVELOPMENTS IN BIOSCIENCES: THEIR IMPLICATIONS FOR LABORATORY ANIMAL SCIENCE; THE THIRD SYMPOSIUM OF THE FEDERATION OF EUROPEAN LABORATORY ANIMAL SCIENCE ASSOCIATIONS, AMSTERDAM, NETHERLANDS, JUNE 1-5, 1987. XXI+457P. KLUWER ACADEMIC PUBLISHERS: DORDRECHT, NETHERLANDS; BOSTON, MASSACHUSETTS, USA. ILLUS. ISBN 0-89838-354-4. 0 (0). 1988. 419-424.*
- Nut def** Van Wouwe, J. P., Veldhuizen, M., and Van der Wal, W. A. A. dietary vitamin e deficiency and zinc metabolism. *Int. J. Vitam. Nutr. Res.* (1991) 61(4): 292-7

- Nut** Van Wouwe, Jacobus, Hoogenkamp, Stefanie, and Van den Hamer, Cornelis J. A. a histidine supplement and regulation of the zinc status in swiss random mice. *Biol. Trace Elem. Res.* (1990) 24(3): 207-16 .
- Nut** Van Wouwe, Jacobus P., Hoogenkamp, Stefanie, and Van den Hamer, Cornelis J. A. histidine supplement and zinc status in swiss random mice. *Biol. Trace Elem. Res.* (1989) 22(1): 35-43.
- Nut def** Van Wouwe, Jacobus P. and Uijlenbroek, Jaap J. M. the role of the pancreas in the regulation of zinc status. *Biol. Trace Elem. Res.* (1994) 42(2): 143-9.
- Nut def** Van Wouwe, Jacobus P. and Veldhuizen, Marcel. growth characteristics in laboratory animals fed zinc-deficient, copper-deficient, or histidine-supplemented diets. *Biol. Trace Elem. Res.* (1996) 55(1/2): 71-77.
- Phys** Van Wouwe, Jacobus P., Veldhuizen, Marcel, Van den Hammer, Cornelis J. A., and De Goeij, Jeroen J. M. discrimination between low dietary zinc and endotoxin exposure: a model study on weaning rats. *Pediatr. Res.* (1990) 28(4): 332-
- No COC** VanDamme, D. 1982. sulfachloropyridazine in the treatment of colibacillosis in neonatal calves. *Bovine Practice* 3(2): 26,28-30.
- Nut def** Vandenbroek, A. H. M. and Thoday, K. L. 1986. skin-disease in dogs associated with zinc-deficiency - a report of 5 cases. *Journal Of Small Animal Practice* 27(5): 313&.
- CP** Vandenhaute, J., Maenhaut, W., Van Rinsvelt, H. A., Hurd, R. W., and Andres, J. M. 1987. metal-deficient diets cause tissue-specific alterations of trace elements. *Trace Elem. Anal. Chem. Med. Biol.Proc. Int. Workshop, 4th* : Meeting Date 1986, 255-64. Editor(s): Braetter, Peter; Schramel, Peter. Publisher: de Gruyter, Berlin, Fed. Rep. Ger.
- Drug** VandenLangenberg, G. M., Mares-Perlman, J. A., Klein, R., Klein, B. E., Brady, W. E., and Palta, M. 1998. associations between antioxidant and zinc intake and the 5-year incidence of early age-related maculopathy in the beaver dam eye study. *American Journal of Epidemiology* 148(2): 204-14.
- HHE** Vanderelst, C. W., Dempster, W. S., Woods, D. L., and Devanheese, H. 1986. serum zinc and copper in thin mothers, their breast-milk and their infants. *Journal Of Tropical Pediatrics* 32(3): 111-114.
- Nut def** Vanderhoof, J. A., Park, J. H., and Grandjean, C. J. 1986. effect of zinc deficiency on mucosal hyperplasia following 70% bowel resection. *American Journal of Clinical Nutrition* 44(5): 670-7.
- HHE** Vanderhoof, J. A., Scopinaro, N., Tuma, D. J., Gianetta, E., Civalleri, D., and Antonson, D. L. 1983. hair and plasma zinc levels following exclusion of biliopancreatic secretions from functioning gastrointestinal-tract in humans. *Digestive Diseases And Sciences* 28(4): 300-305.
- Nut def** Vanderhoof, Jon A., Park, Jung H. Y., and Grandjean, Carter J. effect of zinc deficiency on mucosal hyperplasia following 70% bowel resection. *Am. J. Clin. Nutr.* (1986) 44(5): 670-7.
- HHE** Vanderkooy, P. D. S. and Gibson, R. S. 1987. food-consumption patterns of canadian preschool-children in relation to zinc and growth status. *American Journal Of Clinical Nutrition* 45(3): 609-616.
- FL** Vanderlei, L. C., Arruda Veiga, M. C., Reis, N. S., and Tambeli, C. H. 1995. [histological

alterations in the submandibular glands and testicles in rats induced by soy and zinc deficient diet]. <original> alteracoes histologicas de glandulas submandibulares e testiculos induzidas por dietas a base de soja e dieta zinco deficiente em ratos. *Archivos Latinoamericanos De Nutricion* 45(3): 193-7.

- FL** Vanderlei, L. C. M., Arruda Veiga, M. C. F., Reis, N. S., and Tambeli, C. H. histologic alterations of the submandibular glands and testicles induced by soy and zinc deficient diets. *Arch. Latinoam. Nutr.* (1995) 45(3): 193-197.
- Mineral** Vanhoff, K. and De Schrijver, R. availability of minerals in rats and pigs fed non-purified diets containing inulin. *Nutr. Res. (N. Y.)* (1996) 16(6): 1017-1022
- No COC** Vannucchi, H., Kutnink, M. D., Sauberlich, M., and Howerde, E. 1986. interaction among niacin, vitamin b6 and zinc in rats receiving ethanol. *International Journal For Vitamin And Nutrition Research.* 56(4): 355-362.
- Nut def** Vannucchi, Helio, Kutnink, M. D., Sauberlich, Mark, and Howerde, E. interaction among niacin, vitamin b6 and zinc in rats receiving ethanol. *Int. J. Vitam. Nutr. Res.* (1986) 56(4): 355-62
- HHE** Vanwouwe, J. P., Vandenhamer, C. J. A., and Degoeij, J. J. M. 1986. normal hair zinc levels of children - are they affected by drinking-water hardness. *Biological Trace Element Research* 1986, V11, Dec, P43-50
- HHE** Vanwouwe, J. P., Vangelder, H. H., Enschede, F. A. J., and Vandeveld, E. A. 1988. acute diarrhea, non-responsive to dietary restriction, zinc-deficiency and subclinical growth-retardation in pre-school children. *Trace Elements In Medicine* 5(2): 90-92.
- No COC** Vaquero, M. P., Navarro, M. P., and Conde, R. 1984. effects of ethanol intake on mineral composition of the body of rats. *Revista Espanola De Fisiologia* 40(1): 95-102.
- FL** Vaquero, M. P. Facultad de Farmacia Madrid Espagne Instituto de Nutricion y Bromatologia and Navarro, M. P. 1996. relationship between moderate food restriction during pregnancy and fe, zn and cu contents in maternal tissues and foetuses [undernutrition]. <original> relation entre une restriction alimentaire moderee pendant la gestation et les teneurs en fer, cuivre et zinc des tissus maternels et des foetus [sous-nutrition]. *Reproduction Nutrition Development.* V. 36(3) P. 333-344
- Unrel** Varada, K. R., Harper, R. G., and Wapnir, R. A. 1993. development of copper intestinal absorption in the rat. *Biochemical Medicine and Metabolic Biology* 50(3): 277-83.
- CP** Varadarajan, K., Paliwal K(A), Rajamanickam, C., <Book> Gorsuch J W, Dwyer, F. J., Ingersoll, C. G., and La Point T W: Eds. 1993. metal accumulation in blood and milk of dairy cows grazed or fed by fodder grown on a sewage water disposal site. <book> astm special technical publication; environmental toxicology and risk assessment, 2nd volume. *ASTM Special Technical Publication* (1216): 510-520.
- Mix** Vargas B., R., Laredo C., M. A., and Buitrago, C. 1980. effect of supplements of calcium, phosphorus, copper and zinc on zebu cows. *Revista, Instituto Colombiano Agropecuario* 15(3): 151-160.
- Nut def** Vargas, E., Sanchez, J. M., and Campabadal, C. 1988. protein and mineral content in forages from the north huetar and theatlantica regions of costa rica. i. effect of season and growth stage. *Agronomia Costarricense* 12(1): 33-43.
- No Oral** Vasconcelos, I. M., Trentim, A., Guimaraes, J. A., and Carlini, C. R. 1994. purification and

physicochemical characterization of soyatoxin, a novel toxic protein isolated from soybeans (glycine max). *Archives of Biochemistry and Biophysics* 312(2): 357-366.

- Abstract** Vasey, E. J., Chen, R. W., O'shea, P. M., and Whanger, P. D. accumulation and depletion of zinc in liver and kidney metallo thionein of rats. *PROC OREG ACAD SCI. Proceedings of the Oregon Academy of Science*. 11. 1975 (1976) (Recd 1977) 45-46
- Mineral** Vashishth, S. N., Kapoor Vanita, Lall, D., and Kumar, R. 1998. mineral status and serum alkaline phosphatase activity in lambs fed diets supplemented with fluorine and boron. *Indian Veterinary Journal* 75(1): 17-21.
- Mineral** Vashishtha, S. N., Vanita Kapoor, Yadav, P. S., and Mandal, A. B. 1997. effect of supplemental boron on nutrient utilization, mineral status and blood biochemical constituents in lambs fed high fluorine diet. *Fluoride* 30(3): 165-172.
- Nut** Vasil'eva, E. A. and Makarov, S. N. 1978. effect of premixes on biochemical indicators of blood serum of replacement sows. *Sbornik Nauchnykh Trudov Moskovskoi Veterinarnoi Akademii* 102: 19-21.
- Drug** Vassalo, Marcio A, Fialho, Elias Tadeu, Oliveira, Antonio Ilson Gomes De, Teixeira, Antonio Soares, and Bertechini, Antonio Gilberto. 1997. probiotics for piglets from 10 to 30 kg of life weight. *Revista Brasileira De Zootecnia* 26(1): 131-138.
- Phys** Vassilev, Peter P., Venkova, Kalina, Pencheva, Nevena, Radomirov, Radomir, and Staneva-Stoytcheva, Dushka. changes in the contractile responses to carbachol and in the inhibitory effects of verapamil and nitrendipine on isolated smooth muscle preparations from rats subchronically exposed to pb2+ and zn2+. *Pharmacol. Toxicol. (Copenhagen) (1994)* 75(3-4): 129-35
- Org Met** Vaziri, A. S. 1997. study on the reproductive biology and the testing of some rodenticides against *spermophilus fulvus lichtenstein*. *Applied Entomology and Phytopathology* 66(1&2): 27-29.
- Org Met** Vaziri, A. S. and Farid, A. 1995. the comparative efficacy of two rodenticides against *rattus norvegicus barkenhout* and *nesokia indica gray*. *Applied Entomology and Phytopathology* 62(1-2): 21-23, Ar 96-105.
- FL** Vazquez M, H., Hernandez Hernandez, Horacio, Poindron M, P., Terrazas G, A., Rodriguez R, A. D., Serafin L, N., and Frias C, M. C. E-mail hdzhdz@calli. cnb. unam. mx. 1998. [anosmia in parturient ewes, has no effect on milk production and growth rates of the lambs]. <original> la supresion del olfato maternal en ovejas parturientas, no influye sobre la produccion lactea y el crecimiento de sus crias. P. 79
- Unrel** Veenendaal, M., Zhang, X., Lemmens, A. G., and Beynen, A. C. 1992. liver and plasma copper concentrations in rats fed diets containing various proteins. *Biological Trace Element Research* 34(3): 213-8.
- Unrel** Veitch, E. R. 1972. the management of diabetes mellitus in cats and dogs. *Journal of Small Animal Practice* 13(11): 629-33.
- FL** Vejgaard, L. 1987. [mineral content in mink hair in relation to mineral content of mink feed]. <original> mineralinnholdet i minkhaar relateret til mineralindholdet i mink foder. [fur growth and quality characteristics in fur bearing animals and sheep]. <original> paelstutveckling och paelskvalitetsegenskaper hos paelsdjur och faar. (Pt.14) P. 1-6. No. 33
- No Oral** Velazquez, R. A., Cai, Y., Shi, Q., and Larson, A. A. 1999. the distribution of zinc selenite and expression of metallothionein-iii mrna in the spinal cord and dorsal root ganglia of the rat suggest

a role for zinc in sensory transmission. *Journal of Neuroscience* 19(6): 2288-300.

- Unrel** Ventura, Stephen J. and Kim, Kyehyun. modeling urban nonpoint source pollution with a geographic information system. *Water Resour. Bull.* (1993) 29(2): 189-98
- Chem Meth** Verbanac, Donatella, Milin, Cedomila, Domitrovic, Robert, Giacometti, Jasminka, Pantovic, Radojka, and Ciganj, Zlatko. determination of standard zinc values in the intact tissues of mice by icp spectrometry. *Biol. Trace Elem. Res.* (1997) 57(1): 91-96
- Unrel** Verbanac, Donatella, Milin, Cedomila, Radošević-Stasić, Biserka, Trobonjaca, Zlatko, Domitrovic, Robert, Giacometti, Jasminka, Petkovic, Marija, Cuk, Mira, Ciganj, Zlatko, Rupčić, Jasminka, and Rukavina, Daniel. tissue zinc dynamics during the immune reaction in mice. *Biol. Trace Elem. Res.* (1998) 65(2): 97-108.
- Org Met** Verhagen, M. F. J. M., Meussen, E. T. M., and Hagen, W. R. 1995. on the reduction potentials of Fe and Cu-Zn containing superoxide dismutases. *Biochimica Et Biophysica Acta* 1244(1): 99-103.
- Unrel** Verheijden, J. H. M., Miert, A. S. J. P. A. M. van, Schotman, A. J. H., and Duin, C. T. M. van. 1983. pathophysiological aspects of E. coli mastitis in ruminants. *Veterinary Research Communications* 7(1/4): 229-236.
- Mix** Verheyen, G., Decuypere, E., Chiasson, R. B., Vervloesem, J., Kuhn, E. R., and Michels, H. effect of exogenous LH on plasma concentrations of progesterone and estradiol in relation to the cessation of egg laying induced by different molting methods. *J. Reprod. Fertil.* (1987) 81(1): 13-21 .
- FL** Verheyen, G., Decuypere, E., Kuhn, E. R., Fontaine, G., and De Groote, G. termination of egg laying by induction in hens. effect of different methods on certain parameters of production and on the concentrations of thyroid hormones, prolactin, calcium, phosphorus, sodium, and proteins in blood serum. *Rev. Agric. (Brussels)* (1983) 36(5): 1535-59.
- FL** Verheyen, G., Decuypere, E., Kuhn, E. R., Fontaine, G., and Groote, G. de. 1983. moult induction in the hen. effect of different methods on some performance traits and on thyroid hormone, prolactin, calcium, phosphorus, sodium and protein concentrations in blood serum. *Revue De L'Agriculture* 36(5): 1535-1559.
- No Dose** Verheyen, G., Helsen, J., and Decuypere, E. 1990. accumulation of zinc in egg yolk, ovarian follicles and organs after forced resting by high dietary zinc. *British Poultry Science* 31(1): 147-54.
- Diss** Verheyen, G., Siau, O., Herremans, M., and Decuypere, E. 1990. [economical longevity of layer chickens]. <original> economische levensduur van leghennen. 90 P.
- FL** Verheyen, G. Leuven Univ. Heverlee Belgium Faculty of Agricultural Sciences. Lab. for Physiology of Domestic Animals and Decuypere, E. 1991. egg quality parameters in a second and third laying year as function of the molting age, strain and molting method. *Archiv Fuer Gefluegelkunde*. V. 55(6) P. 275-282
- FL** Verheyen, G. Leuven Univ. Heverlee Belgium Faculty of Agricultural Sciences Lab. for Physiology of Domestic Animals and Decuypere, E. 1991. production parameters in a second and third laying year as function of the molting age, strain and molting method. *Archiv Fuer Gefluegelkunde*. V. 55(5) P. 217-223
- Nut def** Verma, P. C., Gupta, R. P., Sadana, J. R., and Gupta, R. K. Paul. 1988. effect of experimental

zinc deficiency and repletion on some immunological variables in guinea pigs. *Br. J. Nutr.* 59(1): 149-54.

- Nut** Verma, S. V. S. and Shrivastava, H. P. a note on the effect of zinc supplementation in diet on the performance of broilers. *Avian Res.* (1982) 66(3): 95-7 .
- FL** Verma, U., Kawatra, B. L., and Bajaj, S. 1981. effect of feeding zinc-deficient bengal gram (*cicer-arietenum*) diet to rats on the invitro absorption of l-histidine monohydrochloride. *Experientia* 37(12): 1295.
- CP** Vernet, P., Fulton, N., and Aitken, R. J. 1998. characterisation of rat sperm nadph oxidase and control of its activity by zinc. *Journal of Reproduction and Fertility Abstract Series* (21): 19-20.
- Nut def** Vernois, V., Goldberg, M., Carreau, J. P., and Deschamps, N. 1986. chemical-composition of the incisor from rat submitted to a zinc-deficient diet. *Journal Of Dental Research* 65: 555.
- CP** Vesikukka, A., Olkkonen, H., Raisanen, P., and Vanha-Perttula, T. 195. determination of zinc in some rat tissues using plutonium-238 excited x-ray fluorescence. *Proc. - Nord. Meet. Med. Biol. Eng. 3rd* : 41.1-41.2. Editor(s): Uusitalo, A.; Saranummi, N. Publisher: Finn. Soc. Med. Biol. Eng., Tampere, Finland.
- Phys** Vetter, D. E. and Mugnaini, E. 1990. an evaluation of retrograde tracing methods for the identification of chemically distinct cochlear efferent neurons. *Archives Italiennes De Biologie* 128(2-4): 331-53.
- Surv** Vetter, H. leader. 1980. methods of decreasing the heavy-metal content of plants in areas affected by pollution, and means of reducing its harmful effects. <document title>commission of the european communities: environment and quality of life. second environmental research programme 1976-80. 841-844.
- Anat** Vial, J. D., Garrido, J., and Gonzalez, A. 1985. the early changes of parietal cell structure in the course of secretory activity in the rat. *American Journal of Anatomy* 172(4): 291-306.
- Nut def** Victory, W., Smith, J. M., and Vander, A. J. 1981. renal tubular handling of zinc in the dog (hyperzincuria). *American Journal Of Physiology.* 241 (5): F532-F539.
- Nut def** Victory, Winona, Miller, Chris R., Zhu, Shi Ya, and Goyer, Robert A. effect of different levels and periods of lead exposure of tissue levels and excretion of lead, zinc, and calcium in the rat. *Fundam. Appl. Toxicol.* (1987) 8(4): 506-16 .
- No Oral** Victory, Winona, Thomas, Diana, Schoeps, Peter, and Vander, Arthur J. lead increases urinary zinc excretion in rats. *Biol. Trace Elem. Res.* (1982) 4(2-3): 211-19 .
- FL** Viejo, R. E. Universidad Nacional de la Plata Buenos Aires Argentina Fac. de Ciencias Veterinarias. 1991. [copper toxicosis in sheep]. <original> intoxicacion por cobre en el ovino. *Archivos De Medicina Veterinaria.* V. 23(2) P. 109-121
- Nut def** Vignolini Francesco, Nobili Fabio, and Mengheri Elena(A). 1998. involvement of interleukin-1beta in zinc deficiency-induced intestinal damage and beneficial effect of cyclosporine a. *Life Sciences* 62(2): 131-141.
- No Oral** Vigorito, M. and Sclafani, A. 1987. effects of anosmia on polycose appetite in the rat. *Neuroscience and Biobehavioral Reviews* 11(2): 211-3.
- No COC** Vihan, V. S. and Rai, P. Chandra Shekhar Azad Univ. of Agriculture and Technology Mathura

Campus India Dept. of Medicine. 1985. experimental pregnancy toxemia in sheep and goats. *Indian Veterinary Journal*. V. 62(11) P. 958-963

- Drug** Vijaya, J., Subramanyam G(A), and Peramma, D. 1996. role of zinc as an antiatherogenic in experimental rabbits. *Trace Elements and Electrolytes* 13(2): 102-106.
- No COC** Vilberg, T. R. and Beatty, W. W. 1975. behavioral changes following vmh lesions in rats with controlled insulin levels. *Pharmacology, Biochemistry, and Behavior* 3(3): 377-84.
- Nut** Vilela, H., Santos, E. J. dos, and Valente, J. de O. 1983. performance of crossbreed steers (hollandais x zebu) on grass and grassand legume pastures, supplemented with urea and minerals, during the dry season. *Arquivo Brasileiro De Medicina Veterinaria e Zootecnia* 35(2): 197-204.
- No Dose** VILKINA, G. A., POMERANTSEVA, M. D., and RAMAIYA, L. K. absence of the mutagenic effect of cadmium and zinc salts in mouse somatic and germ cells. *SOV GENET (ENGL TRANSL GENETIKA)*; 14 (12). 1978 (1979). 1543-1544.
- No Oral** Vilkina, G. A., Pomerantseva, M. D., and Ramaiya, L. K. 1978. lack of a mutagenic effect of cadmium and zinc salts in mouse somatic and germ cells. *Genetika (Moscow)* 14(12): 2212-14.
- No Oral** VILKINA, G. A., POMERANTSEVA, M. D., and RAMAIYA, L. K. 1978. lack of mutagenic effect of cadmium and zinc salts in mouse somatic germ cells. *GENETIKA* 14(12): 2212-2214.
- Nut def** Villa Elizaga I, Arias Gutierrez H, and Antillon Klusmann F. 1992. effect of maternal zinc deficiency on fetal plasma glucose and insulin and on fetal hepatic insulin binding. *Biology of the Neonate* 62(2-3): 167.
- Nut def** Villa Elizaga, I. and da Cunha Ferreira, R. M. 1985. zinc, pregnancy and parturition. *Acta Paediatrica Scandinavica. Supplement* 319: 150-7.
- HHE** Villa-Elizaga, I., Frizell, E., and Alzina, V. 1987. trace elements in the perinatal medicine of today. *Acta Paediatrica Espanola* 45(9): 497-499.
- FL** Villar, J. A. and Vulich, S. A. 1980. mortality in newborn lambs: immunoglobulin values in corriedale lambs up to one week of age. *Revista De Medicina Veterinaria, Argentina* 61(1): 21-26.
- Nut def** Villet, A., Ravel, A., Richard, M. J., Alary, J., Favier, A., and Roussel, A. M. fish oil effects on tissular fatty acids and plasma lipid peroxidation in zinc deficient rats. *J. Trace Elem. Med. Biol.* (1997) 11(4): 223-231.
- No COC** Vincent, A. M. and Maiese, K. 1999. nitric oxide induction of neuronal endonuclease activity in programmed cell death. *Experimental Cell Research* 246(2): 290-300.
- Phys** Vincent, Andrea M., TenBroeke, Michelle, and Maiese, Kenneth. metabotropic glutamate receptors prevent programmed cell death through the modulation of neuronal endonuclease activity and intracellular ph. *Exp. Neurol.* (1999) 155(1): 79-94.
- No COC** Vincent Bruno, Beaudet Alain, Dauch Pascale, Vincent Jean-Pierre, and Checler Frederic(A). 1996. distinct properties of neuronal and astrocytic endopeptidase 3.4.24.16: a study on differentiation, subcellular distribution, and secretion processes. *Journal of Neuroscience* 16(16): 5049-5059.

- Abstract** Vines, K. B(A), Williams, A. R., Green, W. H., and Spaulding, J. G. 1997. the effect of excess dietary zinc oxide on starter pig growth performance. *Journal of Animal Science* 75(SUPPL. 1): 15.
- Unrel** Viohl, J. 1970. [histological reactions of the dental pulp of the dog to fillings made of palakav]. <original> histologische reaktionen der hundepulpa auf fullungen aus palakav. *Deutsche Zahnarztliche Zeitschrift* 25(3): 379-89.
- FL** Virgens, N. C. das, Ferreira Neto, J. M., Machado, M. A., and Marques Junior, A. de P. 1981. the level of copper iron manganese and zinc in the liver and pancreas of confined and semi confined goats. *Arquivos Da Escola De Veterinaria Universidade Federal De Minas Gerais*. 33(2): 229-234.
- In Vit** Virginio, Caterina and Cherubini, Enrico. glycine-activated whole cell and single channel currents in rat cerebellar granule cells in culture. *Dev. Brain Res.* (1997) 98(1): 30-40.
- FL** Vizcaya Marti, R. and Orendain Galeazzi, G. 1990. [treatment of furcation perforations, in vivo study]. <original> tratamiento de perforaciones en furcacion, estudio in vivo. *Practica Odontologica* 11(12): 15-6, 18-20.
- No COC** Vlad, M., Bordas, E., Caseanu, E., Uza, G., Creteanu, E., and Polinicenco, C. 1995. effect of cuprofilin on experimental atherosclerosis. *Biological Trace Element Research*. 48(1): 99-117.
- CP** Vo, K. V., Peters, J., Adefope, N. A., Fenderson, C. L., and Williamson, H. Jr. effect of selected feed additives on performance of guinea keet broilers. *74TH ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC. POULT SCI.* 64 (Suppl. 1). 1985. 193.
- FL** Vogtmann, H. and Obrist, W. <translated> the influence of zinc-bacitracin on the composting process of chicken manure and on plant growth. die wirkung von zn-bacitracin im huhnemist auf rotte und pflanzenwachstum. *Schweizerische Landwirtschaftliche Monatshefte* Aug/Sept 1978 v. 56 (8/9) p. 197-207. ill.
- FL** Vogtmann, H., Obrist, W., Hauser, K., Pfirter, H.-P., and Augstburger, F. 1978. the influence of zn-bacitracin on composition of chicken manure and onplant growth. *Schweizerische Landwirtschaftliche Monatshefte* 56(8/9): 197-207.
- No COC** Vogtmann, H. Research Inst of Biological Husbandry Switzerl, Obrist, W., Hauser, K., Pfirter, H. P., and Augstburger, F. composting and plant growth: use of chicken manure containing. *Compost Sci.* V19, N5, P22,(4)
- Nut** Vohra, P. 1971. a review of the nutrition of japanese quail. *World's Poultry Science Journal* 27(1): 26-34.
- Mix** Vohra, P., Gottfredson, G. D., and Kratzer, F. H. the effects of high levels of dietary edta zinc or copper on the mineral contents of some tissue of turkey poult's bone liver kidney heart feather testis. *POULTRY SCI.* 47 (4). 1334-1343. 1968.
- Nut def** Vohra, P. and Heil, J. R. dietary interactions between zinc manganese and copper for turkey poult's. *POULTRY SCI.* 48 (5). 1969 1686-1691.
- No COC** Vohra, Pran and Bond, Douglas C. 1970. effect of various levels of dietary edta on the mineral contents of some tissues of coturnix coturnix japonica. *Poultry Sci.* 49(2): 565-8 .
- Nut def** Vojnik, Christine and Hurley, Lucille S. abnormal prenatal lung development resulting from maternal zinc deficiency in rats. *J. Nutr.* (1977) 107(5): 862-72.

- Unrel** Volk, B. 1984. cerebellar histogenesis and synaptic maturation following pre- and postnatal alcohol administration. an electron-microscopic investigation of the rat cerebellar cortex. *Acta Neuropathologica* 63(1): 57-65.
- FL** Volker, H., Rotermund, L., and Bauer, U. 1996. white veal calf fattening and animal welfare. *Berliner Und Munchener Tierarztliche Wochenschrift* 109(2): 55-63.
- Nut def** Volkova, N. A., Garibyan, G. M., and Karplyuk, I. A. 1994. effect of dietary zinc content on the progress of experimental chronic cadmium toxicity. *Voprosy Pitaniya* (5): 21-23.
- In Vit** Volpe, J. J., Sakakihara, Y., and Rust, R. S. dolichol kinase and the regulation of dolichyl phosphate levels in developing brain. *Developmental Brain Research*. 31 (2). 1987. 193-200.
- FL** Von Krziwanek S, Kirchgessner, M., and Grassmann, E. influence of a lysine supplementation to a wheat gluten diet on hematological criteria and activities of metallo enzymes. *Zeitschrift Fuer Tierphysiologie Tierernaehrung Und Futtermittelkunde*. 40 (6). 1978 310-315.
- Nut def** Vormann, J. and Gunther, T. 1986. development of fetal mineral and trace element metabolism in rats with normal as well as magnesium- and zinc-deficient diets. *Biological Trace Element Research*. 9(1): 37-53.
- Nut def** Vormann, J., Hollriegl, V., Merker, H. J., and Gunther, T. 1986. effect of salicylate on zinc metabolism in fetal and maternal rats fed normal and zinc-deficient diets. *Biological Trace Element Research*. 9(1): 55-64.
- Nut def** Vormann, J., Hollriegl, V., Merker, H. J., and Gunther, T. effect of valproate on zinc metabolism in fetal and maternal rats fed normal and zinc-deficient diets. *Biological Trace Element Research*. July 1986. v. 10 (1) p. 25-35. ill.
- Nut def** Vormann, Juergen and Guenther, Theodor. development of fetal mineral and trace element metabolism in rats with normal as well as magnesium- and zinc-deficient diets. *Biol. Trace Elem. Res.* (1986) 9(1): 37-53.
- Nut def** Vormann, Juergen, Michalski, Leonore, and Guenther, Theodor. cellular and humoral immunity in rats after gestational zinc or magnesium deficiency. *J. Nutr. Biochem.* (1996) 7(6): 327-332.
- No COC** Voros, G. Research Centre for Animal Production and Nutrition Godollo Hungary, Laczay, P., and Simon, F. University of Veterinary Science Budapest Hungary. 1986. investigation of the growth promoting effect of zinc bacitracin and virginiamycin combined with ionophorous antibiotics in broiler chicken. *Reports of the Research Centre for Animal Production and Nutrition*. P. 273-279
- No Oral** Voroshilovskaya, S. P. and Raitses, V. S. effect of adrenalectomy on the content of copper, zinc, and iron in animal brain. *Patol. Fiziol. Eksp. Ter.* (1966) 10(6): 78-80.
- Alt** Voroshilovskaya, S. P. and Raitses, V. S. 1966. *Effect of the Removal of the Adrenal Glands on the Copper, Zinc, and Iron Content in the Animal Brain (Vliyanie Udaleniya Nadpochechnykh Zhelez Na Soderzhanie Medi, Tsinka i Zheleza v Golovnom Mozgu Zhivotnykh)*. EPA-TR-73-416
- No COC** Vos, J. G. Kreeftenberg J. G. Engel H. W. B. Minderhoud A. and Van Noorle Jansen L. M. 1978. studies on 2,3,7,8-tetrachlorodibenzo-p-dioxin-induced immune suppression and decreased resistance to infection: endotoxin hypersensitivity, serum zinc concentrations and effect of thymosin treatment. *Toxicology*. 9: 75-86.

- Alt** Voss, C., Hartmann, N., and Hartmann, K. 1974. dietetic induction of obesity in rats. *Nahrung* 18(1): 73-82.
- Mix** Vrese, M. de, Hermes, G., Scholz-Ahrens, K., Barth, C. A., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. antagonistic effects of milk and milk components and phytate concerning the bioavailability of zinc, iron and copper. 656-657.
- CP** Vruwink, K., Gershwin, M. E., Hurley, L. S., and Keen, C. L. effects of low zinc diet during gestation on metallothionein induction in adult mice. *FIFTH JOINT MEETING OF THE AMERICAN INSTITUTE OF NUTRITION, THE AMERICAN SOCIETY FOR CLINICAL NUTRITION, AND THE CANADIAN SOCIETY FOR NUTRITIONAL SCIENCES, DAVIS, CALIF., USA, JULY 20-24, 1986. AM J CLIN NUTR.* 43 (6). 1986. No Pagination.
- Nut def** Vruwink, K., Gershwin, M. E., Hurley, L. S., and Keen, C. L. 1986. effects of low zinc diet during gestation on metallothionein (mt) induction in adult mice. *Journal Of Nutrition* 116: R35.
- Nut def** Vruwink, K. G., Hurley, L. S., Gershwin, M. E., and Keen, C. L. 1988. gestational zinc deficiency amplifies the regulation of metallothionein induction in adult mice. *Proceedings Of The Society For Experimental Biology And Medicine.* 188(1): 30-34.
- CP** Vruwink, K. G., Keen, C. L., Gershwin, M. E., Golub, M. S., and Fletcher, M. P. effects of marginal zinc deprivation on neutrophil function in rhesus monkeys. *74TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, PART II, WASHINGTON, D.C., USA, APRIL 1-5, 1990. FASEB (FED AM SOC EXP BIOL) J.* 4 (4). 1990. A934.
- IMM** Vruwink, K. G., Keen, C. L., Gershwin, M. E., and Hurley, L. S. 1987. studies of nutrition and autoimmunity. failure of zinc deprivation to alter autoantibody production when initiated in disease-established mice. *The Journal Of Nutrition.* 117(1): 177-182.
- Nut def** Vruwink, Kimberly G., Gershwin, M. Eric, and Keen, Carl L. effects of gestational zinc deficiency in mice on growth and immune function. *J. Nutr. Immunol. (1993)* 2(2): 25-41
- Nut def** Vruwink, Kimberly G., Hurley, Lucille S., Gershwin, M. Eric, and Keen, Carl L. gestational zinc deficiency amplifies the regulation of metallothionein induction in adult mice. *Proc. Soc. Exp. Biol. Med. (1988)* 188(1): 30-4.
- Nut def** Vruwink, Kimberly G., Keen, Carl L., Gershwin, M. Eric, and Hurley, Lucille S. studies of nutrition and autoimmunity. failure of zinc deprivation to alter autoantibody production when initiated in disease-established mice. *J. Nutr. (1987)* 117(1): 177-82.
- FL** Vrzgula, L., Bires, J., Jencik, F., Lazar, J., and Konrad, V. 1985. copper oxide in industrial emissions as a cause of poisoning in sheep. *Veterinarstvi* 35(12): 557-559.
- FL** Vukasinovic, M., Mihajlovic, R., and Pavlicevic, N. 1994. comparative studies of the concentration of trace elements in drinkingwater, feed mixtures and muscle tissues in heifers. *Veterinarski Glasnik* 48(11/12): 1029-1033.
- Alt** Vukosavic, S., Dubois Dauphin, M., Romero, N., and Przedborski, S. 1999. bax and bcl-2 interaction in a transgenic mouse model of familial amyotrophic lateral sclerosis. *Vol. 73, No. 6, Pp. 2460-2468 Journal Of Neurochemistry*
- Alt** Waalkes, M. P. 1985. elevation of hepatic metallothionein in rats chronically exposed to dietary ethionine. *Toxicology Letters* 26(2-3): 133-8.

- No Dose** Waalkes, M. P. and Klaassen, C. D. 1984. postnatal ontogeny of metallothionein in various organs of the rat. *Toxicology and Applied Pharmacology* 74(3): 314-20.
- Prim** WAALKES, M. P., PERANTONI, A., and PALMER, A. E. isolation and partial characterization of the low-molecular-mass zinc-cadmium-binding protein from the testes of the patas monkey *erythrocebus-patas* distinction from metallothionein. *BIOCHEM J*; 256 (1). 1988. 131-138.
- Nut def** Waalkes, Michael P. 1986. effect of dietary zinc deficiency on the accumulation of cadmium and metallothionein in selected tissues of the rat. *J. Toxicol. Environ. Health* 18(2): 301-13 .
- Carcin** Waalkes, Michael P. elevation of hepatic metallothionein in rats chronically exposed to dietary ethionine. *Toxicol. Lett.* (1985) 26(2-3): 133-8.
- No Oral** Waalkes, Michael P., Diwan, Bhalthandra A., Weghorst, Christopher M., Ward, Jerrold M., Rice, Jerry M., Cherian, M. George, and Goyer, Robert A. further evidence of the tumor-suppressive effects of cadmium in the b6c3f1 mouse liver and lung: late stage vulnerability of tumors to cadmium and the role of metallothionein. *J. Pharmacol. Exp. Ther.* (1993) 266(3): 1656-63 CODEN: JPETAB; ISSN: 0022-3565.
- No Dose** Waalkes, Michael P. and Klaassen, Curtis D. postnatal ontogeny of metallothionein in various organs of the rat. *Toxicol. Appl. Pharmacol.* (1984) 74(3): 314-20
- FL** Wachnik, A., Biro, G., Biro, L., Korom, M., Gergely, A., and Antal, M. 1993. effect of sex hormones on copper, zinc, iron nutritional status and hepatic lipid peroxidation in rats. *Nahrung* 37(1): 28-34.
- Mix** Wachnik, A., Biro, G., Gergely, A., Nagy, K., Gaal, O., and Antal, M. sex dependent differences in trace element levels in rat tissues. *Nahrung* (1988) 32(10): 999-1001 .
- Diss** Wackernagel, F. W. H. 1985. rice for the terraces: cold-tolerant varieties and other strategies for increasing rice production in the mountains of southeast asia. *Dissertation Abstracts International, A (Humanities and Social Sciences)* 46(1): 222.
- HHE** Wada, L. and King, J. C. 1986. effect of low zinc intakes on basal metabolic-rate, thyroid-hormones and protein-utilization in adult men. *Journal Of Nutrition* 116(6): 1045-1053.
- Phys** Wada, R., Sugo, M., Nakano, M., and Yagihashi, S. 1999. only limited effects of aminoguanidine treatment on peripheral nerve function, (na⁺,k⁺)-atpase activity and thrombomodulin expression in streptozotocin-induced diabetic rats. *Diabetologia* 42(6): 743-7.
- Phys** Wade, G. N., Schneider, J. E., and Friedman, M. I. 1991. insulin-induced anestrus in syrian hamsters. *American Journal of Physiology* 260(1 Pt 2): R148-52.
- Mineral** Wade, Wilda Dixon. 1989. effects of biotin, vitamin-b6, and zinc on growth and trace mineral status of young male rats fed adequate and excess protein. *Avail.: Univ. Microfilms Int. Order No. DA9005827 From: Diss. Abstr. Int. B 1990, 50. 9. 3931. 81 pp.*
- No Oral** Wadkins, Theresa, Benz, Joseph, and Briner, Wayne. 1998. excessive zinc administration during neural tube formation effects neuromuscular development of the rat. *Met. Ions Biol. Med. Proc. Int. Symp., 5th* : 722-725. Editor(s): Collery, Phillipe. Publisher: Libbey Eurotext, Montrouge, Fr..
- Unrel** Waerhaug, J. 1980. temporary restorations: advantages and disadvantages. *Dental Clinics of North America* 24(2): 305-16.

- No COC** Waghorn, G. C., Shelton, I. D., and McNabb, W. C. 1994. effects of condensed tannins in lotus pedunculatus on its nutritive value for sheep. 1. non-nitrogenous aspects. *Journal of Agricultural Science* 123(1): 99-107.
- CP** Wagner, H., Hengst, K., Zierden, E., and Hauss, W. H. inhibitory influence of somatostatin (growth hormone-release-inhibiting factor; srif) on mesenchymal cells of rats. *Abh. Rheinisch-Westfael. Akad. Wiss. (1978)* 63(Int. Symp.: State Prev. Ther. Hum. Arterioscler. Anim. Models, 1977): 355-65.
- IMM** Wagner, P. A., Jernigan, J. A., Bailey, L. B., Nickens, C., and Brazzi, G. A. 1983. zinc nutriture and cell-mediated-immunity in the aged. *International Journal For Vitamin And Nutrition Research* 53(1): 94-101.
- No COC** Wahba, Z. Z., Albayati, Z. A. F., and Stohs, S. J. 1988. effect of 2,3,7,8-tetrachlorodibenzo-paradoxin on the hepatic distribution of iron, copper, zinc, and magnesium in rats. *Journal Of Biochemical Toxicology* 1988, V3, Sum, P121-129
- No Oral** Wahba, Z. Z., Miller, M. S., and Waalkes, M. P. 1994. absence of changes in metallothionein rna in the rat testes made refractory to cadmium toxicity by zinc pretreatment. *Hum. Exp. Toxicol.* 13(1): 65-67.
- HHE** Wahid, M. A., Fathi, S. A. H., and Aboulkhair, M. R. 1988. zinc in human health and disease. *Ricerca In Clinica E In Laboratorio* 18(1): 9-16.
- Nut** Wahlstrom, R. C., Borg, B. S., and Libal, G. W. 1986. protein level and amino acid supplementation of sunflower meal diets fed to young pigs. *Nutrition Reports International* 34(3): 351-355.
- Abstract** Waibel, P. E., Vaughan, G. D., and Behrends, B. R. 1974. effect of zinc methionine complex on growth and reproduction in turkeys. *Poultry Science.* 53(5): 1988.
- Nut def** Wakiyama, K. the pathophysiological significance of trace metals in rats with experimental liver cirrhosis. *Japanese Journal of Gastroenterology.* 84 (1). 1987. 27-35.
- Nut def** WAKU, K., KUDO, N., and NAKAGAWA, Y. 1987. the effect of zinc deficiency and cadmium administration on fatty acid metabolism in rat liver. *JOINT JAPAN-USA CONGRESS OF PHARMACEUTICAL SCIENCES*
- Nut def** Wakui, Akira, Ujiie, Shigeki, Himori, Tatsumi, Asamura, Mitsuo, Suzuki, Maro, and Saito, Tatsuo. tumor cell kinetics and histological findings in yoshida sarcoma-bearing rats fed a zinc-deficient diet. *Gan to Kagaku Ryoho (1979)* 6(Rinji Zokan 2): 331-6.
- OAC** Walden, T. L., Draganac, P. S., and Farkas, W. R. 1984. the elevation of blood levels of zinc protoporphyrin in mice following whole body irradiation. *Blood* 63(5): 1159-67.
- Diss** Walden T.L., Jr. 1983. elevation of blood levels of zinc protoporphyrin in mice following whole body irradiation. *DISS. ABST. INT. PT. B - SCI. & ENG* VOL. 44, NO. 4: 110 pp[^].
- FL** Waldhauser, K., Eder, K., and Kirchgessner, M. the activity of hepatic lysophospholipid acyltransferase in zinc-deficient rats. *J. Anim. Physiol. Anim. Nutr. (1999)* 81(2): 103-112.
- Drug** Waldroup, P. W., Hellwig, H. M., Johnson, Z. B., Fell, R. V., Grant, R. J., Damron, B. L., Hebert, J. A., Siccardi, F. J., and Primo, R. A. 1987. response of broiler chickens to addition of bacitracin methylenedisalicylate and roxarsone to diets containing halofuginone. *Poultry Science* 66(10): 1640-1643.

- Drug** Waldroup, P. W., Hellwig, H. M., Johnson, Z. B., Fell, R. V., Page, R. K., Krueger, W. F., Benibo, B. S., Primo, R. A., Cheng, S. E., Sims, M. D., and et, a. l. 1986. the response of broiler chickens to the addition of bacitracin methylene disalicylate to diets containing salinomycin and roxarsone. *Poultry Science* 65(4): 757-63.
- Drug** Waldroup, P. W., Hellwig, H. M., Johnson, Z. B., Fell, R. V., Primo, R. A., Cheng, S. E., Simms, M. D., and Gerber, P. C. 1986. response of broiler chickens to addition of zinc bacitracin to diets containing salinomycin and raxarsone. *Poultry Science*. 65(7): 1278-1280.
- Drug** Waldroup, P. W., Hillard, C. M., Grigg, J. E., and Harris, G. C. Jr. 1974. the effectiveness of nutrient solutions given to young turkey poult in drinking water or by oral and parenteral dosage. *Poultry Science*. 53 (3): 1056-1060.
- Drug** Waldroup, P. W., Izat, A. L., Primo, R. A., Twining, P. F., Hebert, J. A., Trammell, J. H., Fell, R. V., and Crawford, J. S. 1990. the effect of zinc bacitracin and roxarsone on performance of broiler chickens when fed in combination with narasin. *Poultry Science*. 69(6): 898-901.
- Nut def** Walker, Barry E. and Kelleher, Jerry. plasma whole blood and urine zinc in the assessment of zinc deficiency in the rat. *J. Nutr.* (1978) 108(10): 1702-7
- Abstract** Walker, R. I., Snyder, S. L., Moniot, J. V., and Sobocinski, P. Z. evidence for participation of platelets and granulocytes in the endotoxin syndrome. *ABSTR ANNU MEET AM SOC MICROBIOL. Abstracts of the Annual Meeting of the American Society for Microbiology*. 76. 1976 B61
- No Oral** Walker, R. I., Snyder, S. L., Sobocinski, P. Z., McCarthy, K. F., and Egan, J. E. 1978. possible association of granulocyte mobilization to the peritoneal cavity with zinc chloride induced protection against endotoxin. *Canadian Journal of Microbiology*. 24(7): 834-838.
- No Oral** Walker, R. I., Snyder, S. L., Sobocinski, P. Z., McCarthy, K. F., and Egan, J. E. 1978. Possible Association of Granulocyte Mobilization to the Peritoneal Cavity With ZnCl₂-Induced Protection Against Endotoxin : 7p.
- No Oral** Walker, Richard I., Snyder, Stephen L. , Sobocinski, Philip Z., McCarthy, Kenneth F., and Egan, June E. 1978. possible association of granulocyte mobilization to the peritoneal cavity with zinc chloride-induced protection against endotoxin. *Can. J. Microbiol.* 24(7): 834-8 .
- No Oral** Walker, W. R., Reeves, R., and Kay, D. J. role of copper(2+) and zinc(2+) in the physiological activity of histamine in mice. *Search* (1975) 6(4): 134-5.
- Abstract** Wallace, E. and Calvin, H. I. effects of zinc deficiency on the development of rat spermatozoa. *14TH ANNUAL MEETING OF THE SOCIETY FOR THE STUDY OF REPRODUCTION, CORVALLIS, OREG., USA, AUG. 10-13, 1981. BIOL REPROD.* 24 (Suppl. 1). 1981. 81a.
- Nut def** Wallace, E., Calvin, H. I., Salgo, M. P., Dennis, J. E., and Ploetz, K. normal levels of zinc and sulfhydryls in morphologically abnormal populations of spermatozoa from moderately zinc deficient rats. *GAMETE RES. Gamete Research*. 9 (4). 1984. 375-386.
- Nut** Wallach, J. D. 1979. the mechanics of nutrition for exotic pets. *Veterinary Clinics of North America. Small Animal Practice* 9(3)
- Rev** Wallach, J. D. 1970. nutritional diseases of exotic animals. *Journal of the American Veterinary Medical Association* 157(5): 583-99.
- Nut def** Wallwork, J. C. 1987. appraisal of the methodology and applications for measurement of the zinc

- content of blood components as indicators of zinc status. *Biological Trace Element Research* 12: 335-350.
- Rev** Wallwork, J. C. 1987. zinc and the central nervous-system. *Progress In Food And Nutrition Science* 11(2): 203-247.
- Nut def** Wallwork, J. C., Botnen, J. H., and Sandstead, H. H. 1982. influence of dietary zinc on rat brain catecholamines. *The Journal Of Nutrition.* 112 (3): 514-519.
- Abstract** Wallwork, J. C. and Crawford, I. L. effect of zinc nutriture on amygdala kindling in the adult rat. *71ST ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, WASHINGTON, D.C., USA, MARCH 29-APRIL 2, 1987. FED PROC.* 46 (3). 1987. 885.
- Nut def** Wallwork, J. C. and Duerre, J. A. 1985. effect of zinc deficiency on methionine metabolism, methylation reactions and protein synthesis in isolated perfused rat liver. *The Journal Of Nutrition.* 115(2): 252-262.
- Nut def** Wallwork, J. C., Fosmire, G. J., and Sandstead, H. H. 1979. cyclic feeding patterns and plasma amino acid concentrations in zinc-deficient rats. *Federation Proceedings* 38(3, 1): 606.
- Nut def** Wallwork, J. C., Fosmire, G. J., and Sandstead, H. H. effect of zinc deficiency on appetite and plasma amino acid concentrations in the rat. *Br. J. Nutr. (1981)* 45(1): 127-36.
- Abstract** Wallwork, J. C., Halas, E. S., and Milne, D. B. elemental composition of brain and other organs from rats fed a marginal zinc-deficient diet in utero and during lactation. *ABSTRACTS FROM THE 14TH ANNUAL MEETING OF THE SOCIETY FOR NEUROSCIENCE, PART 2, ANAHEIM, CALIF., USA, OCT. 10-15, 1984. SOC NEUROSCI ABSTR.* 10 (2). 1984. 985.
- Nut def** Wallwork, J. C., Johnson, L. K., Milne, D. B., and Sandstead, H. H. 1983. effect of interactions between dietary egg white protein and zinc on body weight bone growth and tissue trace metals in the 30 day old rat. *Journal of Nutrition.* 113 (7). 1983. 1307-1320. 113(7): 1307-1320.
- Abstract** Wallwork, J. C., Klevay, L. M., and Sandstead, H. H. comparison of the effects of zinc or copper deficiency on catecholamine concentrations in regions of the rat brain. *68TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ST. LOUIS, MO., USA, APR. 1-6, 1984 FED PROC.* 43 (3). 1984. Abstract 2350.
- Unrel** Wallwork, J. C. and Sandstead, H. H. effect of zinc deficiency on appetite and free amino-acid concentrations in rat brain. *J NUTR. Journal of Nutrition.* 113 (1). 1983. 47-54.
- Nut def** Wallwork, J. C. and Sandstead, H. H. effect of zinc deficiency on brain catecholamines and amino acid concentrations in the rat (appetite control). *Proceedings Of The North Dakota Academy Of Science.* Apr 1981. v. 35 p. 39.
- CP** Wallwork, J. C. and Sandstead, H. H. protein and zinc interrelationships in the diet of growing rats. *PAPERS AND COMMUNICATIONS PRESENTED AT THE 74TH ANNUAL MEETING OF THE NORTH DAKOTA ACADEMY OF SCIENCE, BISMARCK, N.D., USA, APRIL 22-24, 1982. PROC N D ACAD SCI.* 35 (0). 1982. 61.
- Nut def** Wallwork, J. C. and Sandstead, H. H. zinc-deficiency, appetite control and plasma amino acids. *Proc. N. D. Acad. Sci. (1980)* : 34, 28.
- Nut def** Wallwork, J. C. JONUA, Milne, D. B., Sims, R. L., and Sandstead, H. H. 1983. severe zinc deficiency: effects on the distribution of nine elements (potassium, phosphorus, sodium,

- magnesium, calcium, iron, zinc, copper and manganese) in regions of the rat brain. *The Journal Of Nutrition*. 113 (10): 1895-1905.
- Nut def** Wallwork, J. C. JONUA and Sandstead, H. H. 1983. effect of zinc deficiency on appetite and free amino acid concentrations in rat brain. *The Journal Of Nutrition*. 113 (1): 47-54.
- Nut def** Wallwork, James C., Botnen, James H., and Sandstead, Harold H. influence of dietary zinc on rat brain catecholamines. *J. Nutr.* (1982) 112(3): 514-19.
- Nut def** Wallwork, James C., Milne, David B., and Sandstead, Harold H. distribution of minerals and catecholamines in rat brain: effects of zinc deficiency. *Neurol. Neurobiol.* (1984) 11B(Neurobiol. Zinc, Part B): 49-64.
- Nut def** Wallwork, James C. and Sandstead, Harold H. effect of zinc deficiency on appetite and free amino acid concentrations in rat brain. *J. Nutr.* (1983) 113(1): 47-54.
- HHE** Walravens, P. A., Krebs, N. F., and Hambidge, K. M. 1983. linear growth of low income preschool-children receiving a zinc supplement. *American Journal Of Clinical Nutrition* 38(2): 195-201.
- In Vit** Walsh, K. B., Cannon, S. D., and Wuthier, R. E. 1992. characterization of a delayed rectifier potassium current in chicken growth plate chondrocytes. *American Journal of Physiology* 262(5 Pt 1): C1335-40.
- Abstract** Walter, R. M., Uriu-Hare, J. Y., and Keen, C. L. influence of diabetes and pregnancy of maternal and fetal zinc-65 kinetics in the rat. *73RD ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, NEW ORLEANS, LOUISIANA, USA, MARCH 19-23, 1989. FASEB (FED AM SOC EXP BIOL) J.* 3 (3). 1989. A457.
- FL** Walton, J. R. 1984. the effect of dietary zinc bacitracin on the resistance status of intestinal escherichia coli and enterococci from broiler chickens. *Zentralblatt Fur Veterinarmedizin. ; Reihe B.* 31 (1): 1-8.
- No COC** Walton, J. R. modes of action of growth promoting agents. *WHITE, E. G. (ED.). FORTSCHRITTE DER VETERINAERMEDIZIN, VOL. 33. ADVANCES IN VETERINARY MEDICINE; NORMAL AND INDUCED CHANGES IN THE GASTRO-INTESTINAL MICROFLORA IN MAN AND ANIMALS WITH SPECIAL REGARD TO ANIMAL PERFORMANCE; INTERNATIONAL SYMPOSIUM, OSLO, NORWAY, SEPT. 25-26, 1980. 95P. VERLAG PAUL PAREY: BERLIN, WEST. GERMANY. PAPER. ISBN 3-489-63616-3. 0 (0). 1982. P77-82.*
- No Oral** Wamboldt, M. Z. and Insel, T. R. the ability of oxytocin to induce short latency maternal behavior is dependent on peripheral anosmia. *Behavioral Neuroscience.* 101 (3). 1987. 439-441.
- Nut def** Wan, D. Y. Y., Cerklewski, F. L., and Leklem, J. E. 1993. increased plasma pyridoxal-5'-phosphate when alkaline phosphatase activity is reduced in moderately zinc-deficient rats. *Biological Trace Element Research.* 39(2/3): 203-210.
- In Vit** Wan, Min, Hunziker, Peter E., and Kaegi, Jeremias H. R. induction of metallothionein synthesis by cadmium and zinc in cultured rabbit kidney cells (rk-13). *Biochem. J.* (1993) 292(2): 609-15.
- FL** Wang, A. and Shan, A. S. 1992. effects of ca and zn on mineral content of serum, reproductive organs and tibia in white leghorn hens. *Chinese Journal of Animal Science* 28(6): 23-25.

- FL** wang An, Shan Anshan, and Xu Zhenying (Northeast Agricultural Univ., Harbin China Research Section of Animal Nutrition. 1989. effects of calcium and zinc level of ration on growth, biochemical indexes of blood and zinc content of body in leghorn-type chickens. *Journal of Northeast Agricultural College*. V. 20(2) P. 146-153
- FL** Wang An (Northeast Agricultural Coll., Harbin China. 1994. studies on the bioavailability of various zinc sources in broilers. *Acta Zoonutrimenta Sinica*. V. 6(1) P. 44-51
- Gene** Wang, B., Fallon, J. F., and Beachy, P. A. 2000. hedgehog-regulated processing of gli3 produces an anterior/posterior repressor gradient in the developing vertebrate limb. *Cell* 100(4): 423-34.
- FL** Wang, B., Gu, C., Liu, J., Yan, Z., Wang, X., and Yang, S. influence of zinc deficiency on metabolism of vitamin a in rats. *ACTA NUTR SIN*. 12 (2). 1990. 139-145.
- Phys** Wang Baolin, Fallon John F, and Beachy Philip A(A). 2000. hedgehog-regulated processing of gli3 produces an anterior/posterior repressor gradient in the developing vertebrate limb. *Cell*. 100(4): 423-434.
- Nut def** Wang, De-Cai, Xu, Hong-Yan, Zhou, Xu-Bin, and Zhou, Li-Jun. effect of zinc deficiency on nitric oxide synthase i in corpus cavernosum penis of rats. *Zhongguo Bingli Shengli Zazhi* (1999) 15(8): 726-728.
- Nut def** Wang, Decai, Xu, Hongyan, Shang, Li, and Zhou, Xubin. bioavailability of compound protein zinc and zinc sulfate in rats. *Zhongguo Shenghua Yaowu Zazhi* (1998) 19(6): 372-374.
- Nut def** Wang, Fudi, Zhao, Faji, Guo, Junsheng, Jing, Naihe, Ma, Xiaofeng, and Mei, Zhentong. effects of zinc deficiency during pregnancy and lactation of maternal mice on learning ability and hippocampal long-term potentiation of offspring. *Zhongguo Shenjing Kexue Zazhi* (1998) 14(1): 20-23.
- Nut** Wang, Guijie, Yu, Shouyang, and Bao, Chunyi. effect of different levels of protein intake on metabolism of protein, zinc, iron, and copper in rats. *Zhongguo Gonggong Weisheng Xuebao* (1995) 14(2): 90-3.
- FL** Wang, Guijuan, Li, Shunyi, and Yuan, Ye. effect of zinc-fortified milk powder on hematopoiesis in mice. *Zhonghua Xueyexue Zazhi* (1999) 20(12): 643-645.
- Nut** Wang, H. R., Feng, H. Z., Reng, J. K., Li, H. R., Purser, D. B., and Peter, D. W. 1995. seasonal dynamics of the nutritive value of pasture and their influence on feed intake and production of grazing sheep at aohan farm, innermongolia. *ACIAR Technical Reports Series* (32): 17-24.
- FL** Wang Handong, Wang Zongyuan, and Lu Xiaolong (Jiangsu Agricultural Coll., Yangzhou China Dept. of Animal Science and Veterinary Medicine. 1991. influences of supplemented dietary zinc and copper on the metabolism of copper in chickens in vivo. *Journal of Jiangsu Agricultural College*. V. 12(3) P. 7-12
- FL** Wang HongRong, Shao Kai, Rong WeiHeng, Xu GuiMei, Zhang HaiYing, Shan Dan, and Bao SaiNa. 1998. a study of digestion and metabolism of zinc methionine chelate in sheep. *Acta Veterinaria Et Zootechnica Sinica* 29(4): 322-331.
- Unrel** Wang, J. and Jin, J. P. 1998. conformational modulation of troponin t by configuration of the nh2-terminal variable region and functional effects. *Biochemistry* 37(41): 14519-28.
- No COC** Wang, Jack and Pierson, Richard N. Jr. distribution of zinc in skeletal muscle and liver tissue in normal and dietary controlled alcoholic rats. *J. Lab. Clin. Med.* (1975) 85(1): 50-8.

- An Prod** Wang Jianwen (Laiyang Agricultural Coll., Liaoning China Dept. of Animal Husbandry and Veterinary Medicine, Wang Zhe, and Li Yuyi. 1990. effects of rations with higher level of calcium on growth, hematological parameters and immunity of layer chickens. *Bulletin of Veterinary College of PLA*. V. 10(3) P. 280-284
- Org Met** Wang, P. Y. 1973. control of sugar cane field rats with zinc phosphide. *Taiwan Sugar* 20: 110-113.
- Nut def** Wang, Ping, Jin, Daxun, and Fan, Wenxun. influence of essential fatty acid on experimental zinc deficiency in rats. *Yingyang Xuebao* (1991) 13(2): 133-6.
- Nut def** Wang, Ping, Jin, Daxun, Fan, Wenxun, and Qian, Xueshe. the beneficial effect of evening primrose oil on zinc deficient rats. *Yingyang Xuebao* (1993) 15(2): 175-9.
- HHE** Wang, T. T. Y., Reisenauer, A. M., and Halsted, C. H. comparison of folate conjugase ec-3.4.22.12 activities in human pig rat and monkey intestine. *Journal of Nutrition*. 115 (6). 1985. 814-819.
- FL** Wang Taizhong and Zhang Huazheng. 1994. an experimental study on the induction of atherosclerosis by hyperinsulinemia in rabbits. *Acta Academiae Medicinae Hubei* 15(1): 1-3.
- Phys** Wang, Wei, Post, Joan I., Dow, Kimberly E., Shin, Seon H., Riopelle, Richard J., and Ross, Gregory M. zinc and copper inhibit nerve growth factor-mediated protection from oxidative stress-induced apoptosis. *Neurosci. Lett.* (1999) 259(2): 115-118.
- In Vit** Wang, X. and Rostas, J. A. 1996. effect of hypothyroidism on the subcellular distribution of Ca^{2+} /calmodulin-stimulated protein kinase ii in chicken brain during posthatch development. *Journal of Neurochemistry* 66(4): 1625-32.
- Mineral** Wang, Y., Funk, M. A., Garleb, K. A., and Chevreau, N. 1994. the effect of fiber source in enteral products on fecal weight, mineral balance, and growth rate in rats. *JPEN. Journal of Parenteral and Enteral Nutrition* 18(4): 340-5.
- FL** Wang, Y. M., Zhao, X., Tang, C. H., Linghu, J. F., Zhao, B. L., Zhang, X. L., Cheng, F. J., Fan, W. B., and Zhang, Y. P. 1985. the distribution of zinc in body tissues and its effect on the growth and reproduction of pigs. *Acta Veterinaria Et Zootechnica Sinica* 16(2): 83-88.
- Mix** Wang, Y. Z., Yan, D. Z., Zhang, Y. Q., and Hua, S. R. 1989. the effect of nutrient additive on the growth of angora rabbits. *Fur Animal Farming* 43(3): 3-6.
- Unrel** Wang, Yang, Michel, F. J., Wing, A., Simmen, F. A., and Simmen, R. C. M. 1997. cell-type expression, immunolocalization, and deoxyribonucleic acid-binding activity of basic transcription element binding transcription factor, an sp-related family member, in porcine endometrium of pregnancy. *Vol. 57, No. 4, Pp. 707-714 Biol. Reprod.*
- FL** Wang Yin, Sha Anshan, and Xu Zhenying (Northeast Agricultural Coll., Harbin China Lab. of Animal Nutrition. 1989. effects of high dietary calcium on zinc utilization in chicks. *Journal of Northeast Agricultural College*. V. 20(1) P. 55-61
- Nut def** Wang, Yingming and Ma, Fenglou. interaction of organic zinc and heme iron in living organisms. *Yingyang Xuebao* (1992) 14(2): 120-5.
- FL** Wang Yingming and Ma Fenglou. 1992. studies on the interaction of organic zinc and heme iron in rats. *Acta Nutrimenta Sinica* 14(2): 120-125.

No COC	Wang, Yuejian, Liang, Bailin, and Watson, Ronald R. the effect of alcohol consumption on nutritional status during murine aids. <i>Alcohol (N. Y.)</i> (1994) 11(3): 273-8.
Nut	Wang, Yuejian, Liang, Bailin, and Watson, Ronald R. normalization of nutritional status by various levels of vitamin e supplementation during murine aids. <i>Nutr. Res. (N. Y.)</i> (1994) 14(9): 1375-86.
Drug	Wang, Yuejian, Liang, Bailin, and Watson, Ronald R. suppression of tissue levels of vitamin a, e, zinc and copper in murine aids. <i>Nutr. Res. (N. Y.)</i> (1994) 14(7): 1031-41.
Phys	Wang, Z., Atkinson, S. A., Bertolo, R. F. P., Polberger, S., and Lonnerdal, B. 1993. alterations in intestinal uptake and compartmentalization of zinc in response to short-term dexamethasone therapy or excess dietary zinc in piglets. <i>Pediatric Research</i> 33(2): 118-124.
CP	Wang, Z., Bertolo, F., and Atkinson, S. A. intestinal uptake and distribution of zinc in response to dexamethasone or excess dietary zinc in the piglet model. 1992 MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY (FASEB), PART I, ANAHEIM, CALIFORNIA, USA, APRIL 5-9, 1992. <i>FASEB (FED AM SOC EXP BIOL) J.</i> 6 (4): 1992. A1087.
Unrel	Wang, Z. and Quirocho, F. A. 1998. complexes of adenosine deaminase with two potent inhibitors: x-ray structures in four independent molecules at ph of maximum activity. <i>Biochemistry</i> 37(23): 8314-24.
CP	Wang Z(A), Ward, W. E., Lonnerdal, B., and Atkinson, S. A. 1993. copper uptake and its interaction with zinc and iron in intestinal brush border membrane vesicles (bbmv) in the developing piglet. <i>FASEB Journal</i> 7(3-4): A299.
No Oral	Wang, Z. H., Iguchi, H., Ohshio, G., Imamura, T., Okada, N., Tanaka, T., and Imamura, M. 1996. increased pancreatic metallothionein and glutathione levels: protecting against cerulein- and taurocholate-induced acute pancreatitis in rats. <i>Pancreas</i> 13(2): 173-83.
Unrel	Wang, Z. Z., Mathias, A., Gautam, M., and Hall, Z. W. 1999. metabolic stabilization of muscle nicotinic acetylcholine receptor by rapsyn. <i>Journal of Neuroscience</i> 19(6): 1998-2007.
FL	Wang, Zefu, Ding, Shouxian, Kang, Zhongwang, Xiang, Weijun, Zhang, Wanyou, Chen, Shunying, Lin, Baohua, Tang, Zongqiong, Yuan, Tao, and et al. the study of chronic toxicity of methyl chloride. <i>Weisheng Dulixue Zazhi</i> (1988) 2(3): 143-5.
No Tox	Wang, Zhenlin, Zhou, Mingqi, and Feng, Sumei. 1995. the effect of two kinds of dietary fibers on the level of serum lipid and three elements calcium, iron, zinc in rats. <i>Xi'an Yike Daxue Xuebao</i> 16(2): 125-127.
FL	Wangenheim, M., Pasi, and Jenny, E. rodenticide poisonings of animals in switzerland. <i>Schweiz. Arch. Tierheilk.</i> ; 113: 350-360; 1971 ; (REF:46)
HHE	Wani, M. A., Conkright, M. D., Jeffries, S., Hughes, M. J., and Lingrel, J. B. 1999. cdna isolation, genomic structure, regulation, and chromosomal localization of human lung kruppel-like factor. Vol. 60, No. 1, Pp. 78-86 <i>Genomics</i>
HHE	Wapnir, R. A. 1988. diarrheal disease and zinc supplementation. <i>Journal Of Pediatric Gastroenterology And Nutrition</i> 7(6): 793-795.
Mix	Wapnir, R. A. and Balkman, C. 1991. inhibition of copper absorption by zinc: effect of histidine. <i>Biological Trace Element Research.</i> 29(3): 193-202.

- Nut def** Wapnir, R. A. and Devas, G. 1995. copper deficiency: interaction with high-fructose and high-fat diets in rats. *American Journal of Clinical Nutrition* 61(1): 105-10.
- Alt** Wapnir, R. A., Khani, D. E., Bayne, M. A., and Lifshitz, F. 1983. absorption of zinc by the rat ileum - effects of histidine and other low-molecular-weight ligands. *Journal Of Nutrition* 113(7): 1346-1354.
- CP** Wapnir, R. A. and Lee, S. Y. dietary regulation of copper absorption and storage by zinc and histidine. *SYMPOSIUM ON ADVANCES IN CLINICAL NUTRITION HELD AT THE AMERICAN COLLEGE OF NUTRITION'S 32ND ANNUAL MEETING, CLEARWATER BEACH, FLORIDA, USA, OCTOBER 11-14, 1991. J AM COLL NUTR.* 10 (5). 1991. 549.
- Alt** Wapnir, R. A., Stiel, L., and Lee, S. Y. 1989. zinc intestinal absorption: effect of carbohydrates. *Nutrition Research.* 9(11): 1277-1284.
- Mix** Wapnir, Raul A., Devas, Gerard, and Solans, Cecilia Vaquero. inhibition of intestinal copper absorption by divalent cations and low-molecular-weight ligands in the rat. *Biol. Trace Elem. Res.* (1993) 36(3): 291-305 .
- Nut def** Wapnir, Raul A., Garcia-Aranda, Jose A., Mevorach, Debra E. K., and Lifshitz, Fima. differential absorption of zinc and low-molecular-weight ligands in the rat gut in protein-energy malnutrition. *J. Nutr.* (1985) 115(7): 900-8.
- No COC** Wapnir, Raul A. and Lee, Shih Yu. zinc intestinal absorption: effect of free fatty acids and triglycerides. *J. Trace Elem. Exp. Med.* (1990) 3(3): 255-65 .
- In Vit** Wapnir, Raul A. and Stiel, Lily. zinc intestinal absorption in rats : specificity of amino acids as ligands. *J. Nutr.* (1986) 116(11): 2171-9 .
- Abstract** Ward, T. L., Asche, G. L., Louis, G. F., and Pollmann, D. S. 1996. zinc-methionine improves growth performance of starter pigs. *Journal of Animal Science* 74(SUPPL. 1): 182.
- Nut** Ward, T. L., Watkins, K. L., and Southern, L. L. 1993. interactive effect of sodium zeolite a and eimeria acervulina infection on growth and tissue minerals in chicks. *Poultry Science* 72(11): 2172-2175.
- Mix** Ward, T. L., Watkins, K. L., and Southern, L. L. 1990. interactive effects of sodium zeolite a (ethacal) and monensin in uninfected and eimeria acervulina-infected chicks. *Poultry Science* 69(2): 276-80.
- HHE** Warfvinge, J. and Bergenholtz, G. healing capacity of human and monkey dental pulps following experimentally-induced pulpitis. *ENDOD DENT TRAUMATOL. Endodontics & Dental Traumatology.* 2 (6). 1986. 256-262.
- Nut def** Warkany, Josef and Petering, Harold G. congenital malformations of the brain produced by short zinc deficiencies in rats. *Amer. J. Ment. Defic.* (1973) 77(5): 645-53.
- Nut def** Warkany, Josef and Petering, Harold G. congenital malformations of the central nervous system in rats produced by maternal zinc deficiency. *Teratology* (1972) 5(3): 319-34.
- Surv** Warren, Robert J., Wallace, Billy M., and Bush, Parshall B. 1990. trace elements in migrating blue-winged teal: seasonal-, sex- and age-class variations. *Environ. Toxicol. Chem.* 9(4): p521-8.
- In Vit** Wasserman, R. H. 1979. *Molecular Mechanisms of the Epithelial Transport of Toxic Metal Ions*,

Particularly Mercury, Cadmium, Lead, Arsenic, Zinc, and Copper. Progress Report, January 1, 1979-December 31, 1979

- In Vit** Wasserman, R. H. and Fullmer, C. S. 1986. *Molecular Mechanisms of the Epithelial Transport of Toxic Metal Ions. Final Report, September 1, 1975-December 31, 1985. DOE/EV/02792-12*
- HHE** Wastney, M. E., Aamodt, R. L., Rumble, W. F., and Henkin, R. I. 1986. kinetic-analysis of zinc-metabolism and its regulation in normal humans. *American Journal Of Physiology* 251(2): R398-R408.
- HHE** Wastney, M. E. and Henkin, R. I. 1988. development and application of a model for zinc-metabolism in humans. *Progress In Food And Nutrition Science* 12(3): 243-254.
- Meth** Wastney, M. E., Subramanian, K. N., Broering, N., and Boston, R. 1997. using models to explore whole-body metabolism and accessing models through a model library. *Metabolism: Clinical and Experimental* 46(3): 330-2.
- In Vit** Watanabe Kazuto(A), Hasegawa Kaoru(A), Ohtake Hideki(A), Tohyama Chiharu, and Koga Mutuyosi(A). 1993. inhibition of dna synthesis by edta and its cancellation by zinc in primary culture of adult rat hepatocytes. *Biomedical Research (Tokyo)* 14(2): 99-110.
- Nut def** Watanabe, Kazuyuki. effect of zinc on iron metabolism in rats . *Nippon Ika Daigaku Zasshi* (1975) 42(3): 218-27.
- No COC** Watanabe, Misuzu, Yoshida, Yasuhisa, Kono, Koichi, and Umebayashi, Kazuyo. element levels in various tissues of rats after long-term fluoride ingestion. *Biomed. Res. Trace Elem. (1990)* 1(1): 41-5.
- Abstract** WATANABE, T., SHIMADA, T., and ENDO, A. susceptibility of zinc deficient mice to mitomycin c and x-ray. *TERATOLOGY* 20:169,1979
- Nut def** Watanabe, Toshiaki. 1997. effects of zinc deficiency on sperm viability and morphology in mice. *Nippon Eiyo Shokuryo Gakkaishi* 50(4): 311-315.
- Nut def** Watanabe, Toshiaki and Endo, Akira. cytogenetic effects of cadmium on unfertilized oocytes in short-term zinc deficiency in hamsters. *Mutat. Res. (1997)* 395(2,3): 113-118.
- Nut def** Watanabe, Toshio, Arakawa, Tetsuo, Fukuda, Takashi, Higuchi, Kazuhide, and Kobayashi, Kenzo. zinc deficiency delays gastric ulcer healing in rats. *Dig. Dis. Sci. (1995)* 40(6): 1340-4.
- Meth** Watanabe, Y., Ito, T., Harada, T., Kobayashi, S., Ozaki, T., and Nimura, Y. 1995. spatial distribution and pattern of extrinsic nerve strands in the aganglionic segment of congenital aganglionosis: stereoscopic analysis in spotting lethal rats. *Journal of Pediatric Surgery* 30(10): 1471-6.
- No Oral** WATANABE, Y., NONOMURA, F., TANAHASHI, N., SUGITANI, A., and YAMADA, F. preventive effect of pretreatment with zinc on cadmium nephrotoxicity in rats evaluation by changes of urinary enzyme activities. *IND HEALTH; 23 (1). 1985. 25-36.*
- Mix** Watkins, Don W., Khalafi, Reza, Cassidy, Marie M., and Vahouny, George V. alterations in calcium, magnesium, iron, and zinc metabolism by dietary cholestyramine. *Dig. Dis. Sci. (1985)* 30(5): 477-82 .
- CP** Watkins, K., Southern, L., Craig, W., and Engstrom, M. efficacy of chelated copper and zinc

compounds in uninfected and eimeria-acervulina infected chicks. *72ND ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, LAS VEGAS, NEVADA, USA, MAY 1-5, 1988. FASEB (FED AM SOC EXP BIOL) J.* 2 (5). 1988. Abstract 4696.

- CP** Watkins, K. L. and Southern, L. L. effect of dietary sodium zeolite a ethacol and-or calcium on growth plasma and bone characteristics of chicks. *73RD ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, NEW ORLEANS, LOUISIANA, USA, MARCH 19-23, 1989. FASEB (FED AM SOC EXP BIOL) J.* 3 (3). 1989. A772.
- CP** Watkins, K. L. and Southern, L. L. effect of dietary sodium zeolite a on zn utilization of uninfected and eimeria-acervulina infected chicks. *78TH ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC. POULT SCI.* 68 (Suppl. 1). 1989. 156.
- Mineral** Watkins, Kevin L. and Southern, L. Lee. 1991. effect of dietary sodium zeolite a and graded levels of calcium on growth , plasma, and tibia characteristics of chicks. *Poult. Sci.* 70(11): 2295-303 .
- Nut** Watkins, Kevin L. and Southern, L. Lee. 1993. effect of dietary sodium zeolite a on zinc utilization by chicks. *Poult. Sci.* 72(2): 296-305.
- Phys** Watson, M. A. and Milbrandt, J. expression of the nerve growth factor-regulated ngfi-a and ngfi-b genes in the developing rat. *DEVELOPMENT (Cambridge).* 110 (1). 1990. 173-184.
- Unrel** Watson, T. D. 1998. diet and skin disease in dogs and cats. *Journal of Nutrition* 128(12 Suppl): 2783S-2789S.
- Nut** Watson, T. D. G. 1997. nutritional management of chronic liver disease in dogs and cats. *Revista De Medicina Veterinaria (Buenos Aires)* 78(5): 322-324.
- Unrel** Watts, A. and Paterson, R. C. 1981. a comparison of pulp responses to two different materials in the dog and the rat. *Oral Surgery, Oral Medicine, and Oral Pathology* 52(6): 648-52.
- Nut def** Wauben, Ine P. M., Xing, Hua-Cheng, and Wainwright, Patricia E. neonatal dietary zinc deficiency in artificially reared rat pups retards behavioral development and interacts with essential fatty acid deficiency to alter liver and brain fatty acid composition. *J. Nutr.* (1999) 129(10): 1773-1781.
- CP** Weaver, D. L., Nockels, C. F., Kimberling, C. V., Engle, T. E., and Johnson, A. B. 1996. changes in immune response during zinc repletion and depletion due to zinc source and amount. *FASEB Journal* 10(3): A514.
- Anat** Weakley, B. S. and James, J. L. 1982. differentiation of endoplasmic reticulum in the developing oocyte of the golden hamster (mesocricetus auratus). *Cell and Tissue Research* 223(1): 127-39.
- Meth** Weakley, B. S., Webb, P., and James, J. L. 1981. cytochemistry of the golgi apparatus in developing ovarian germ cells of the syrian hamster. *Cell and Tissue Research* 220(2): 349-72.
- Abstract** Wedekind K(A), Walker, L., Hancock, J., Titgemeyer, E., and Reeves, R. 1995. bioavailability of zinc and calcium is affected by certain fiber sources. *FASEB Journal* 9(3): A450.
- Nut def** Wedekind, K. J. and Baker, D. H. zinc bioavailability in feed-grade sources of zinc. *J. Anim. Sci.* (1990) 68(3): 684-9 .

- CP** Wedekind, K. J., Hortin, A. E., and Baker, D. H. bioavailability of zinc in a zinc-methionine chelate. *79TH ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION, INC., BLACKSBURG, VIRGINIA, USA, MAY 1990. POULT SCI.* 69 (Suppl. 1). 1990. 142.
- Nut def** Wedekind, K. J., Hortin, A. E., and Baker, D. H. methodology for assessing zinc bioavailability: efficacy estimates for zinc-methionine, zinc sulfate, and zinc oxide. *J. Anim. Sci.* (1992) 70(1): 178-87 .
- CP** Wedekind, K. J., Lewis, A. J., Giesemann, M. A., and Miller, P. S. zinc bioavailability for pigs responses to zinc supplementation of a corn-soybean meal diet. *MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE AND AMERICAN DAIRY SCIENCE ASSOCIATION, MIDWESTERN SECTION, DES MOINES, IOWA, USA, MARCH 23-25, 1992. J ANIM SCI.* 70 (Suppl. 1). 1992. 61.
- Unrel** Wedekind, K. J. and Lowry, S. R. 1998. are organic zinc sources efficacious in puppies? *Journal of Nutrition* 128(12 Suppl): 2593S-2595S.
- Abstract** Wedekind Karen(A), Collings G(A), Hancock, J., and Titgemeyer, E. 1994. the bioavailability of zinc-methionine relative to zinc sulfate is affected by calcium level. *Poultry Science* 73(SUPPL. 1): 114.
- Unrel** Wedenberg, C. and Bornstein, R. 1990. pulpal reactions in rat incisors to caridex. *Australian Dental Journal* 35(6): 505-8.
- No Oral** Wedig, J. H., Kennedy, G. L., Jenkins, D. H., Henderson, R., and Keplinger, M. L. teratologic evaluation of zinc omadine when applied dermally on yorkshire pigs. *Toxicology and Applied Pharmacology.* 33 (1). 1975 123
- No COC** Wedig, J. H., Wentworth, R. A., Gallo, M. A., Babish, J. G., and Henion, J. D. disposition of zinc pyrithione in the rat. *Food and Cosmetics Toxicology.* 16 (6). 1978 (Recd. 1979). 553-562.
- In Vit** Wegger, I., Kristiansen, P. H., and Palludan, B. zinc metabolism in pigs. x. importance of calcium in the developmentzinc deficiency. <Document Title>*Arsberetning 1976. Institut for* : A74-A82.
- Nut def** Wegger, I. and Palludan, B. 1973. (zinc metabolism in swine. iv. a. placental transfer or zn65 in normaland zinc deficient gilts. b. resorption and distribution of zn65 innormal and zinc deficient newborn pigs). <. Document Title>*Aarsberetning.* 51-73.
- Nut def** Wegger, I. and Palludan, B. 1978. zinc metabolism in swine with special emphasis on reproduction. <Document Title>*Trace Element in Man and Animals* - 3. 428-435.
- Phys** Wei, D. and Andrews, G. K. 1988. molecular cloning of chicken metallothionein deduction of the complete amino acid sequence and analysis of expression using cloned complementary dna. *Nucleic Acids Research.* 16(2): 537-554.
- Gene** Wei, Deyue and Andrews, Glen K. molecular cloning of chicken metallothionein. deduction of the complete amino acid sequence and analysis of expression using cloned cdna. *Nucleic Acids Res.* (1988) 16(2): 537-53.
- Abstract** Weigand, E. true absorption and total utilization of dietary zinc at various ages. *33RD MEETING OF THE GESELLSCHAFT FUER ERNAEHRUNGSPHYSIOLOGIE DER HAUSTIERE (SOCIETY FOR NUTRITIONAL PHYSIOLOGY OF DOMESTIC ANIMALS), GOETTINGEN, WEST GERMANY, MAR. 26-28, 1979. Z TIERPHYSIOL TIERERNAHR FUTTERMITTELKD.* 42 (1). 1979. 40.

- No Oral** Weigand, E. and Kirchgessner, M. 1976. ⁶⁵zn-labeled tissue zinc for determination of endogenous fecal zinc excretion in growing rats. *Nutrition and Metabolism* 20(5): 314-20.
- FL** Weigand, E. and Kirchgessner, M. 1979. absorbability of zinc from different compounds. *Z. Tierphysiol. Tierernaehr. Futtermittelkd.* 42(3): 137-46.
- No Oral** Weigand, E. and Kirchgessner, M. absorption, endogenous excretion, and balance of zinc in growing rats on diets with various sugars replacing starch. *Biol. Trace Elem. Res.* (1992) 34(1): 67-77 .
- FL** Weigand, E. and Kirchgessner, M. 1977. absorption of zinc from different compounds. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde*
- FL** Weigand, E. and Kirchgessner, M. 1979. application of the radioisotope dilution technique for the determination of zinc absorption at different age and supply status of the experimental animals. *Z. Tierphysiol. Tierernaehr. Futtermittelkd.* 42(1): 44-56
- FL** Weigand, E. and Kirchgessner, M. 1977. dietary zinc supply and efficiency of food utilization for growth. *Z. Tierphysiol. Tierernaehr. Futtermittelkd.* 39(1): 16-26.
- FL** Weigand, E. and Kirchgessner, M. factorial estimation of the zinc requirement of lactating dairy cows. *Z TIERPHYSIOL TIERERNAEHR FUTTERMITTELKD. Zeitschrift Fuer Tierphysiologie Tierernaehrung Und Futtermittelkunde.* 47 (1). 1982. 1-9.
- CP** Weigand, E. and Kirchgessner, M. 1978. homeostatic adaptation of zinc absorption and endogenous zinc excretion over a wide range of dietary zinc supply. *Trace Elem. Metab. Man Anim. Proc. Int. Symp., 3rd* : Meeting Date 1977, 106-9. Editor(s): Kirchgessner, M. Publisher: Arbeitskreis Tierernaehrungsforschung Weihestephana Inst. Ernaehrungsphysiol., Freising-Weihestephana, Ger. CODEN: 40FLAC.
- FL** Weigand, E. and Kirchgessner, M. 1977. model study on the factorial derivation of the requirement of trace elements. zinc requirement of the growing rat. *Z. Tierphysiol. Tierernaehr. Futtermittelkd.* 39(2): 84-95.
- No Oral** Weigand, E. and Kirchgessner, M. radioisotope dilution technique for determination of zinc absorption in vivo. *Nutr. Metab.* (1976) 20(5): 307-13 .
- FL** Weigand, E. and Kirchgessner, M. 1944. use of the isotope dilution method for the estimation of zincabsorption in experimental animals at different ages and withdifferent supplies. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde*
- No Oral** Weigand, E. and Kirchgessner, M. zinc-65 labeled tissue zinc for determination of endogenous fecal zinc excretion in growing rats. *NUTR METAB. Nutrition and Metabolism.* 20 (5). 1976 (Recd 1977) 314-320.
- QAC** Weigand, E., Minne, C., and Walz, O. P. 1991. zinc availability from zinc-supplemented heat-treated egg albumin in growing rats. *Trace Elem. Man Anim. 7: Monogr. Proc., Round Tables Discuss. Int. Symp., 7th* : Meeting Date 1990, 25-14-25/15. Editor(s): Momcilovic, Berislav. Publisher: Inst. Med. Res. Occup. Health Univ. Zagreb, Zagreb, Yugoslavia. CODEN: 57RKAP.
- Phys** Weinberger, R. P. and Rostas, J. A. 1991. effect of zinc on calmodulin-stimulated protein kinase ii and protein phosphorylation in rat cerebral cortex. *Journal of Neurochemistry* 57(2): 605-14.
- Unrel** Weiner, L. and Green, H. 1998. basonuclin as a cell marker in the formation and cycling of the murine hair follicle. *Differentiation* 63(5): 263-72.

- Abstract** Weingartner, K. E. and Erdman, J. W. Jr. coprophagy control by taste aversion and its application in zinc bio availability experiments. *64TH ANNUAL MEETING OF THE FED. AM. SOC. EXP. BIOL., ANAHEIM, CALIF., USA, APR. 13-18, 1980. FED PROC.* 39 (3). 1980. Abstract 4474.
- No COC** Weingartner, K. E. and Erdman, J. W. Jr. coprophagy prevention in rats by conditioning with lithium chloride. *Nutrition Reports International.* 27 (2). 1983. 357-364.
- Bio Acc** Weingartner, K. E., Erdman, J. W. Jr., Parker, H. M., and Forbes, R. M. effect of soybean hull upon the bioavailability of zinc and calcium from soy flour-based diets. *Nutr. Rep. Int.* (1979) 19(2): 223-31 .
- Gene** Weiskirchen, R. and Bister, K. 1993. suppression in transformed avian fibroblasts of a gene (crp) encoding a cysteine-rich protein containing lim domains. *Oncogene* 8(9): 2317-24.
- In Vit** Weiskirchen, R., Pino, J. D., Macalma, T., Bister, K., and Beckerle, M. C. 1995. the cysteine-rich protein family of highly related lim domain proteins. *The Journal Of Biological Chemistry.* 270(48): 28946-28954.
- Nut def** Weismann, K., Christophersen, J., and Kobayasi, T. ultrastructural changes of zinc deficient rat epidermis: an electron microscopic study. *Acta Derm.-Venereol.* (1980) 60(3): 197-202
- Nut** Weiss, F. G. and Scott, M. L. 1979. effects of dietary fiber, fat and total energy upon plasma cholesterol and other parameters in chickens. *Journal of Nutrition* 109(4): 693-701.
- FL** Weiss, I. 1965. [investigations on the problem of the central nervous regulation of the function of alpha cells in the pancreas of the albino rat. i. behavior of zinc contained in the alpha cells of the rat following adrenalectomy and loading with insulin]. <original> untersuchungen zur frage der zentralnervosen regulation der a-zellfunktion am pankreas der albinoratte. i. das verhalten des a-zellzinks der ratte nach adrenektomie und insulinbelastung. *Endokrinologie* 47(3): 183-92.
- Unrel** Weiss, J. F., Kumar, K. S., Walden, T. L., Neta, R., Landauer, M. R., and Clark, E. P. 1990. advances in radioprotection through the use of combined agent regimens. *International Journal of Radiation Biology* 57(4): 709-22.
- CP** Weisstaub, A., Ronayne De Ferrer P, Zeni, S., and De Portela M L. 1999. influence of low dietary calcium on pup growth and zinc (zn) levels in maternal blood and milk, in rats. *FASEB Journal* 13(4 PART 1): A579.
- Nut** Welch, R. M. and House, W. A. availability to rats of zinc from soybean glycine-max cultivar amsoy seeds as affected by maturity of seed source of dietary protein and soluble phytate. *Journal of Nutrition.* 112 (5). 1982. 879-885.
- Nut** Welch, R. M. and House, W. A. 1982. availability to rats of zinc from soybean seeds as affected by maturity of seed, source of dietary protein, and soluble phytate. *The Journal Of Nutrition.* 112 (5): 879-885.
- CP** Welch, Ross M. and House, William A. effect of dietary zinc and cadmium on selenium and cadmium availability to rats fed lettuce leaves with varying selenium levels. *Trace Elem. Metab. Man Anim.* Proc. Int. Symp., 4th (1982): Meeting Date 1981, 568-71. Editor(s): Gawthorne, J. M.; Howell, J. McC.; White, C. L. Publisher: Springer, Berlin, Fed. Rep. Ger.
- Plant** Welch, Ross M., House, William A., and Allaway, William H. 1974. availability of zinc from pea seeds to rats. *J. Nutr.* 104(6): 733-40 .
- FL** Welker, D. and Neupert, G. 1974. [comparative biological test of polyacrylate and phosphate

cement in monolayer cultures]. <original> vergleichender biologischer test von polyakrylat- und phosphatzement an monolayer-kulturen. *Stomatologie Der DDR* 24(9): 602-10.

- No COC** WELLS, L. J., KIM, J. N., and LAZAROW, A. effects of insulin on the complications of diabetes and pregnancy in the rat. *DIABETES* 9:490-493,1960
- Abstract** WELSH, J. J., RADER, J. I., COLLINS, T. F. 10TH, BLACK, T. N., RORIE, J. I., and KOPRAL, C. A. developmental effects and maternal and fetal mineral interactions of rats fed diets containing textured vegetable protein. *TERATOLOGY* 37(5):500,1988
- Mineral** Welsh, John J., Rader, Jeanne I., Collins, Thomas F. X., Black, Thomas N., Rorie, James I., and Kopral, Christine A. developmental effects and mineral interactions in rats fed textured vegetable protein. *Teratology* (1990) 42(1): 67-78.
- Unrel** Wen, G. Y., Sturman, J. A., and Shek, J. W. 1985. a comparative study of the tapetum, retina and skull of the ferret, dog and cat. *Laboratory Animal Science* 35(3): 200-10.
- Mix** WEN, JIANGUO, LI, YULU, and LU, DISHENG. 300. changes of ldh-x activity of seminiferous tubules of mouse testis in acute cadmium poisoning and the protective effect of zinc. *HUNAN YIKE DAXUE XUEBAO*; 21 (4). 1996. 295-297
- Mineral** Wendler, C. 1995. possibility of mineral supply for canaries (*serinus canaria*) with commercially available feeds. 115 pp.
- Mix** Wendt, B. 1977. iron, zinc and copper in a milk formula fed to rats. *Naringsforskning* 21(4): 304-305.
- CP** Wenk, C. 1987. dose-effect relationship of growth promoters on nutrient digestibilities in pigs. 245-249.
- No Oral** Wenk, G. L., Harrington, C. A., Tucker, D. A., Rance, N. E., and Walker, L. C. 1992. basal forebrain neurons and memory: a biochemical, histological, and behavioral study of differential vulnerability to ibotenate and quisqualate. *Behavioral Neuroscience* 106(6): 909-23.
- Mix** Wenk, G. L. and Stemmer, K. L. 1981. the influence of ingested aluminum upon norepinephrine and dopamine levels in the rat brain. *Neurotoxicology* 2(2): 347-53.
- Nut def** Wenk, G. L. and Stemmer, K. L. 1983. suboptimal dietary zinc intake increases aluminum accumulation into the rat brain. *Brain Research* 288(1-2): 393-5.
- Nut def** Wenk, Gary L. and Stemmer, Klaus L. activity of the enzymes dopamine-beta-hydroxylase and phenylethanolamine-n- methyltransferase in discrete brain regions of the copper-zinc deficient rat following aluminum ingestion. *Neurotoxicology* (1982) 3(1): 93-9.
- Mix** Wenk, Gary L. and Stemmer, Klaus L. suboptimal dietary zinc intake increases aluminum accumulation into the rat brain. *Brain Res.* (1983) 288(1-2): 393-5 .
- Nut def** Wensink, J., Hoeve, H., Mertens zur Borg, I., and Hamer, C. J. A. van den. 1989. dietary zinc deficiency has no effect on auditory brainstem responses in the rat. *Biological Trace Element Research*. 22(1): 55-62.
- Nut def** Wensink, J., Lenglet, W. J. M., Vis, R. D., and Van den Hamer, C. J. A. the effect of dietary zinc deficiency on the mossy fiber zinc content of the rat hippocampus. a microbeam pxe study. *Histochemistry* (1987) 87(1): 65-9.

- Fate** Wensink, J., Molenaar, A. J., Woroniecka, U. D., and Vandenhamer, C. J. A. 1988. zinc uptake into synaptosomes. *Journal Of Neurochemistry* 50(3): 782-789.
- Nut def** Wensink, J., Paays, C. H., and Hamer, C. J. A. van den. 1987. uptake and turnover of ⁶⁵zn in subcellular fractions of brain of rate under normal and zinc-deficient conditions. *Biological Trace Element Research*. 14(1/2): 127-141.
- Nut def** Wensink, J., Paays, C. H., and Vandenhamer, C. J. A. 1987. uptake and turnover of zn-65 in subcellular-fractions of brain of rat under normal and zinc-deficient conditions. *Biological Trace Element Research* 14(1-2): 127-141.
- No Oral** Wensink, Jan, Paays, Clement H., and Van den Hamer, Cornelis J. A. uptake and turnover of zinc-65 in subcellular fractions of brain of rat under normal and zinc-deficient conditions. *Biol. Trace Elem. Res. (1987)* 14(1-2): 127-41.
- Nut def** Wensink, Jan and Van den Hamer, Cornelis J. A. effect of excess dietary histidine on rate of turnover of zinc-65 in brain of rat. *Biol. Trace Elem. Res. (1988)* 16(2): 137-50.
- Surv** Wenzel, C. and Adelung, D. 1996. the suitability of oiled guillemots (uria aalge) as monitoring organisms for geographical comparisons of trace element contaminants. *Archives of Environmental Contamination and Toxicology* 31(3): 368-77.
- Bio Acc** Wenzel, C. and Gabrielsen, G. W. 1995. trace element accumulation in three seabird species from hornoya, norway. *Vol. 29, No. 2, Pp. 198-206* Arch. Environ. Contam. Toxicol.
- Bio Acc** Wenzel, Christine Institut fur Meereskunde Kiel Germany, Adelung, Dieter, and Theede, Hans. distribution and age-related changes of trace elements in kittiwake. *Sci Total Environ. V193, N1, P13(14)*
- Nut def** Werman, M. J. and Bhathena, S. J. low dietary zinc copper ratio and the copper deficiency. 1992 MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY (FASEB), PART I, ANAHEIM, CALIFORNIA, USA, APRIL 5-9, 1992. FASEB (FED AM SOC EXP BIOL) J. 6 (4). 1992. A1097.
- Nut def** Werman, Moshe J. and Bhathena, Sam J. the effects of low dietary zinc in copper-deficient rats fed high fructose diet. *J. Nutr. Biochem. (1992)* 3(11): 605-8.
- Nut def** Werman, Moshe J., Law, Joseph S., Castro, Joseph S., and Bhathena, Sam J. effects of zinc and copper interactions in rats. *Met. Ions Biol. Med. Proc. Int. Symp., 2nd (1992): 377-8.* Editor(s): Anastassopoulou, Jane. Publisher: Libbey, Montrouge, Fr..
- FL** Wermuth, J. F., Weiser, H., and Rambeck, W. A. 1993. influence of vitamin c on cadmium retention in japanese quails. <original title> influence de la vitamine c sur la retention du cadmium chez la caille japonaise. *Vol. 144, No. 1, Pp. 39-42* Rev. Med. Vet.
- Anat** Wernig, A., Carmody, J. J., Anzil, A. P., Hansert, E., Marciniak, M., and Zucker, H. 1984. persistence of nerve sprouting with features of synapse remodelling in soleus muscles of adult mice. *Neuroscience* 11(1): 241-53.
- Drug** Werther, C. A., Cloud, H., Ohtake, M., and Tamura, T. 1986. effect of long-term administration of anticonvulsants on copper, zinc, and ceruloplasmin levels. *Drug-Nutrient Interactions* 4(3): 269-274.
- Mix** Wesenberg, G. B. R., Fosse, G., Rasmussen, P., and Justesen, N. P. B. 1980. the effect of pb and cd uptake on zn and cu levels in hard and soft tissues of rats. *International Journal of*

Environmental Studies 15(1): 41-48.

- Nut def** West, G. B. diet and adjuvant-induced arthritis in the rat. *Int. Arch. Allergy Appl. Immunol.* (1980) 63(3): 347-50.
- CP** West, J. R. ethanol exposure during development alters the terminal field of zinc-containing mossy fibers. *FREDERICKSON, C. J., G. A. HOWELL AND E. J. KASARSKIS (ED.). NEUROLOGY AND NEUROBIOLOGY, VOL. 11B. THE NEUROBIOLOGY OF ZINC: PART B. DEFICIENCY, TOXICITY, AND PATHOLOGY; PROCEEDINGS OF A SATELLITE SYMPOSIUM TO THE ANNUAL MEETING OF THE SOCIETY FOR NEUROSCIENCE, BOSTON, MASS., USA, NOV. 4-6, 1983. XIII+345P. ALAN R. LISS, INC.: NEW YORK, N.Y., USA. ILLUS. ISBN 0-8451-2713-6. 0 (0). 1984. 235-250.*
- Nut def** West, K. R., Dreosti, I. E., Gargett, C. E., and Record, I. 1980. aggregation by platelets from pregnant zinc deficient rats. *Nutrition Reports International* 22(1): 1-8.
- In Vit** Westbrook, G. L. and Mayer, M. L. 1987. micromolar concentrations of zn^{2+} antagonize nmda and gaba responses of hippocampal neurons. *Nature* 328(6131): 640-3.
- Gene** Westin, G. and Schaffner, W. 1988. a zinc-responsive factor interacts with a metal-regulated enhancer element (mre) of the mouse metallothionein-i gene. *Embo Journal.* 7(12): 3763-3770.
- In Vit** Westman, G. and Midander, J. post irradiation di ethyl di thio carbamate inhibition of copper zinc super oxide dis mutase reduces clonogenic survival of chinese hamster v-79 cells. *INT J RADIAT BIOL RELAT STUD PHYS CHEM MED. International Journal of Radiation Biology & Related Studies in Physics Chemistry & Medicine.* 45 (1). 1984. 11-20.
- No Oral** Westman, N. G. and Marklund, S. L. 1987. inability of polyethylene-glycol substituted copper- and zinc-containing superoxide dismutase to protect mice against radiation lethality. *Acta Oncologica* 26(6): 483-7.
- Drug** Westman, N. G. and Marklund, S. L. 1987. inability of polyethylene-glycol substituted copper-containing and zinc-containing superoxide-dismutase to protect mice against radiation lethality. *Acta Oncologica* 26(6): 483-487.
- Nut def** Westmoreland, N. 1971. connective tissue alterations in zinc deficiency. *Federation Proceedings* 30(3): 1001-10.
- No Oral** Wetter, L., Aagren, M. S., Hallmans, G., Tengrup, I., and Rank, F. effects of zinc oxide in an occlusive, adhesive dressing on granulation tissue formation. *Acta Pharmacol. Toxicol. Suppl.* (1986): 59(7), 184-7 .
- Drug** Wetter, L., Agren, M. S., Hallmans, G., Tengrup, I., and Rank, F. 1986. effects of zinc oxide in an occlusive, adhesive dressing on granulation tissue formation. *Scandinavian Journal of Plastic and Reconstructive Surgery* 20(2)
- Bio Acc** Weyers, B., Gluck, E., and Stoeppler, M. 1988. investigation of the significance of heavy metal contents of blackbird feathers. *Sci Total Environ.* 77(1): 61-7.
- CP** Whanger, P. D. and Church, D. C. relationship of metallo thionein to zinc metabolism in cattle. *75TH ANNUAL MEETING OF THE AMERICAN DAIRY SCIENCE ASSOCIATION, BLACKSBURG, VA., USA, JUNE 15-18, 1980. J DAIRY SCI.* 63 (Suppl. 1). 1980. 146.
- Unrel** Whanger, P. D. and Deagen, J. T. 1991. influence of zinc on copper binding in tissue proteins of

steers. *Biological Trace Element Research* 28(2): 69-82.

- CP** Whanger, P. D. And Deagen, J. T. Influence Of Zinc Upon The Deposition Of Copper In Bovine Hepatic Fractions. Kagi, J. H. R. And Y. Kojima (Ed.). *Experientia Supplementum*, Vol. 52. *Metallothionein II; Second International Meeting On Metallothionein And Other Low Molecular Weight Metal-Binding Proteins*, Zurich, Switzerland, August 21-24, 1985. Xii+755p. Birkhaeuser Verlag Ag: Basel, Switzerland; Boston, Massachusetts, Usa. Illus. Isbn 3-7643-1804-X; Isbn 0-8176-1804-X. 0 (0). 1987. 728.
- No Control** Whanger, P. D. and Deagen, J. T. 1962. rat liver metallothionein. interactions of silver, zinc, and cadmium. *Biol. Trace Elem. Res.* 4(2-3): 199-210 .
- CP** Whanger, P. D., Oh, S. H., and Deagen, J. T. effects of dietary sulfur on tissue metallothionein in rats. *Trace Elem. Metab. Man Anim.* Proc. Int. Symp., 4th (1982): Meeting Date 1981, 660-3. Editor(s): Gawthorne, J. M.; Howell, J. McC.; White, C. L. Publisher: Springer, Berlin, Fed. Rep. Ger. CODEN: 47QGAV.
- Nut def** Whanger, P. D., Oh, S. H., and Deagen, J. T. 1981. ovine and bovine metallothioneins: accumulation and depletion of zinc in various tissues. *Journal of Nutrition* 111(7): 1196-1206.
- In Vit** Whanger, P. D., Oh, S. H., and Deagen, J. T. 1981. ovine and bovine metallothioneins: purification, number of species, zinc content and amino acid composition. *Journal of Nutrition* 111(7): 1207-1215.
- Nut def** Whanger, P. D., Oh, S.-W., and Deagen, J. T. 1981. ovine and bovine metallothioneins. (i) accumulation and depletion of zinc in various tissues. (ii) purification, number of species, zinc content and amino acid composition. *Journal of Nutrition* 111(7): 1196-1206, 1207-1215.
- CP** Whanger, P. D., Ridlington, J. W., and Holcomb, C. L. interactions of zinc and selenium on the binding of cadmium to rat tissue proteins (diet, toxicity, rats). *Annals Of The New York Academy Of Sciences.* 1980. v. 355 p. 333-346.
- Mix** Whanger, P. D. and Weswig, P. H. effect of supplementary zinc on the intracellular distribution of hepatic copper in rats. *J. Nutr.* (1971) 101(8): 1093-7 .
- CP** Wheeler John C, Bieschke Erik T, and Tower John(A). 1995. muscle-specific expression of drosophila hsp70 in response to aging and oxidative stress. *Proceedings of the National Academy of Sciences of the United States of America* 92(22): 10408-10412.
- Abstract** Wheeler, T. L., Cross, H. R., Schelling, G. T., Greene, L. W., and Byers, F. M. the effects of dietary management and sex class on gain carcass grades fabrication yield and primal and retail cut composition. *ANNUAL MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE, LOGAN, UTAH, USA, JULY 28-31, 1987. J ANIM SCI.* 65 (Suppl. 1). 1987. 289-290.
- Phys** White Anthony R, Reyes Rosario, Mercer Julian F B, Camakaris James, Zheng Hui, Bush Ashley I, Multhaup Gerd, Beyreuther Konrad, Masters Colin L, and Cappai Roberto(A). 1999. copper levels are increased in the cerebral cortex and liver of app and aplp2 knockout mice. *Brain Research* 842(2): 439-444.
- CP** White, C. L. reduced protein intake and altered body composition in zinc-deficient rats. *Trace Elem. Man Anim.* -- *TEMA 5* Proc. Int. Symp., 5th (1985): Meeting Date 1984, 213-17. Editor(s): Mills, C. F.; Bremner, I.; Chesters, J. K. Publisher: CAB, Farnham Royal, Slough, UK..
- Nut def** White, C. L. 1988. relationship between plasma zinc, angiotensin-converting enzyme, alkaline phosphatase and onset of symptoms of zinc deficiency in the rat. *Australian Journal of*

- Nut def** White, C. L., Barnes, M. J. Commonwealth Scientific and Industrial Research Organisation Wembley Australia Div. of Animal Production, Kyme, H. J. Murdoch Univ. Murdoch Australia, and Costa, N. D. Nutrition Society of Australia ed. 1994. marginal deficiency in pregnant merino ewes [sheep]. [meeting paper]. proceedings of the nutrition society of australia. eighteenth annual scientific meeting. P. 85. No. 18
- Nut** White, C. L., Chandler, B. S., and Peter, D. W. Commonwealth Scientific and Industrial Research Organisation Wembley Australia Div. of Animal Production. 1991. zinc supplementation of lactating ewes and weaned lambs grazing improved mediterranean pastures. *Australian Journal of Experimental Agriculture*. V. 31(2) P. 183-189
- Nut def** White, C. L. and Martin, G. B. 1988. some pathological and productivity effects of zinc deficiency in theram. *Proceedings of the Nutrition Society of Australia* 13: 86.
- Nut** White, C. L., Martin, G. B., Hynd, P. I., and Chapman, R. E. CSIRO Division of Animal Production Private Bag Po Wembley Western Australia 6014 Australia. 1994. the effect of zinc deficiency on wool growth and skin and wool follicle histology of male merino lambs. *British Journal of Nutrition*. V. 71(3) P. 425-435
- Nut def** White, C. L., Pschorr, J., Jacob, I. C. M., Lutterotti, N., and Dahlheim, H. 1985. a comparison of the effects of enalapril and zinc deficiency on the activity of angiotensin converting enzyme in rat plasma. *Proceedings of the Nutrition Society of Australia* 10: 162.
- CP** White, C. L., Pschorr, J., Jacob, I. C. M., Lutterotti, N. von, and Dahlheim, H. reduced angiotensin i-converting enzyme- and kininase i-activities in the plasma of zinc-deficient rats. *Trace Elements In Man And Animals : Tema 5 : Proceedings Of The Fifth International Symposium On Trace Elements In Man And Animals / Editors C.f. Mills, I. Bremner, & J.k. Chesters*. p. 65-70.
- CP** White, C. Roger, Brock Tommy A, Chang Ling-Yi, Crapo James, Briscoe Page, Ku David, Bradley William A, Gianturco Sandra H, Gore Jeri, Freeman Bruce A, and Tarpey Margaret M(A). 1994. superoxide and peroxynitrite in atherosclerosis. *Proceedings of the National Academy of Sciences of the United States of America* 91(3): 1044-1048.
- CP** White, C. W., Avraham, K. B., and Shanley, P. superoxide dismutase overexpression in transgenic mice decreases lethal pulmonary oxygen toxicity. *ANNUAL MEETING OF THE WESTERN SOCIETY FOR PEDIATRIC RESEARCH, CARMEL, CALIFORNIA, USA, FEBRUARY 6-9, 1990. CLIN RES.* 38 (1). 1990. 207a.
- Alt** White, C. W., Avraham, K. B., Shanley, P. F., and Groner, Y. 1991. transgenic mice with expression of elevated levels of copper-zinc superoxide dismutase in the lungs are resistant to pulmonary oxygen toxicity. *Journal of Clinical Investigation* 87(6): 2162-8.
- Nut def** White, Colin L. 1988. the effect of zinc deficiency on the body composition of rats. *Biol. Trace Elem. Res.* 17: 175-87 .
- Surv** White, D. H. and Cromartie, E. 1985. bird use and heavy metal accumulation in waterbirds at dredge disposal impoundments, corpus christi, texas. *Bull Environ Contam Toxicol.* 34(2): 295-300.
- Mix** WHITE, F. D., NEATHERY, M. W., GENTRY, R. P., MILLER, W. J., LOGNER, K. R., and BLACKMON, D. M. the effects of different levels of dietary lead on zinc metabolism in dairy calves. *J DAIRY SCI*; 68 (5). 1985. 1215-1225.

Mineral	Whitehead, C. C., Dewar, W. A., and Downie, J. N. factors affecting the retention of calcium by the chick. <i>Brit. Poult. Sci.</i> (1972) 13(2): 197-200.
No Oral	Whitehouse, M. W., Rainsford, K. D., Taylor, R. M., and Vernon-Roberts, B. 1990. zinc monoglycerolate: a slow-release source of zinc with antiarthritic activity in rats. <i>Agents Actions</i> 31(1-2): 47-58 .
Nut def	Whitelock, K. A., Leach, R. M., and Fosmire, G. J. effect of zinc deficiency on longitudinal bone growth. <i>FASEB J</i> 1998 Mar;12(5 Pt 2):A635
Nut def	Whitenack, D. L., Whitehair, C. K., and Miller, E. R. influence of enteric infection on zinc utilization and clinical signs and lesions of zinc deficiency in young swine. <i>American Journal of Veterinary Research</i> SN- 0002-9645 PY- 1978
HHE	Whitham, S. E., Murphy, G., Angel, P., Rahmsdorf, H. J., Smith, B. J., Lyons, A., Harris, T. J., Reynolds, J. J., Herrlich, P., and Docherty, A. J. 1986. comparison of human stromelysin and collagenase by cloning and sequence analysis. <i>Biochemical Journal</i> 240(3): 913-6.
Dead	Whiting, R. C. and Richards, J. F. influence of zinc ions on postmortem and physical properties of chicken muscle. <i>Can. Inst. Food Sci. Technol. J.</i> (1978) 11(2): 62-5 .
Alt	Whiting, R. C. and Richards, J. F. water extractable calcium and zinc in red and white chicken muscle during aging and thaw rigor. <i>Canadian Institute of Food Science and Technology Journal.</i> 11 (2). 1978 59-61.
CP	Whitley, R. D., Samuelson, D. A., Hendricks, D. G., Hendricks, H. B., Olson, A. E., Shupe, J. L., and Leone, N. C. ocular effects of chronic low zinc diet in the pig. <i>ANNUAL SPRING MEETING OF THE ASSOCIATION FOR RESEARCH IN VISION AND OPHTHALMOLOGY, SARASOTA, FLORIDA, USA, MAY 1-6, 1988. INVEST OPHTHALMOL VISUAL SCI.</i> 29 (Abstr. Issue). 1988. 289.
Unrel	Whitton, B. A., Potts, M., Simon, J. W., and Grainger, S. L. J. phosphatase activity of the blue-green alga cyanobacterium nostoc-commune utex 584. <i>PHYCOLOGIA. Phycologia.</i> 29 (2). 1990. 139-145.
Drug	Wicker, D. L., Iscrigg, W. N., and Trammell, J. H. 1977. the control and prevention of necrotic enteritis in broilers with zinc bacitracin. <i>Poultry Science</i> 56(4): 1229-31.
Abstract	Wiebold, J. L. embryo mortality and the uterine environment in lactating dairy cows. <i>ANNUAL MEETING OF THE AMERICAN SOCIETY OF ANIMAL SCIENCE, LOGAN, UTAH, USA, JULY 28-31, 1987. J ANIM SCI.</i> 65 (Suppl. 1). 1987. 401-402.
No Dose	Wiebold, J. L. 1988. embryonic mortality and the uterine environment in first-service lactating dairy cows. <i>Journal of Reproduction and Fertility</i> 84(2): 393-399.
CP	Wied, D. de. 1966. inhibitory effect of acth and related peptides on extinction of conditioned avoidance behavior in rats. <i>Proceedings of the Society for Experimental Biology and Medicine;</i> 122
Phys	Wielgus-Serafinska, Ewa and Strzelec, Malgorzata. zinc and lead interactions on alkaline phosphatase (ec 3.1.3.1) activity in rats. <i>Acta Physiol. Pol.</i> (1982) 33(5-6): 425-39 .
Surv	Wiemeyer, Stanley N., Schmeling, Sheila K., and Anderson, Allen. 1987. environmental pollutant and necropsy data for ospreys from the eastern united states, 1975-1982. <i>J. Wildl. Dis.</i> 23(2): 279-91 .

- FL** Wienker, H. G. 1967. [electron microscopic studies on the specificity of the osmium-zinc-iodide method]. <original> elektronenmikroskopische untersuchungen zur spezifitat der osmium-zink-jodid-methode. *Zeitschrift Fur Mikroskopisch-Anatomische Forschung* 76(1): 70-102.
- Unrel** Wiesemueller, W., Poppe, S., and Hackl, W. studies of the energy metabolism of pigs at a feeding level at live weight equilibrium. *Archives of Animal Nutrition.* 38 (7-8). 1988. 603-618.
- Nut def** Wight, P. A. L. 1977. the ultrastructure of the interdigital web in experimental zincdeficiency of ducks. *Avian Pathology* 6(2): 111-125.
- CP** Wight, P. A. L. and Dewar, W. A. 1978. aspects of the histology of zinc deficiency in domestic birds. *Trace Elem. Metab. Man Anim. Proc. Int. Symp., 3rd* : Meeting Date 1977, 215-17. Editor(s): Kirchgessner, M. Publisher: Arbeitskreis Tierernaehrungsforschung Weihenstephan Inst. Ernaehrungsphysiol., Freising-Weihenstephan, Ger. CODEN: 40FLAC.
- Nut def** Wight, P. A. L. and Dewar, W. A. the histopathology of zinc deficiency in ducks. *J. Pathol.* (1976) 120(3): 183-91.
- FL** Wight, P. A. L. and Dewar, W. A. 1978. the ultrastructure of the crop in the zinc-deficient chicken. *Zentralblatt Fur Veterinarmedizin* 25A(8): 652-663.
- Nut def** Wight, P. A. L., Dewar, W. A., and MacKenzie, G. M. 1980. monocytosis in experimental zinc deficiency of domestic birds. *Avian Pathology* 9(1): 61-66.
- No Dose** Wight, P. A. L., Shannon, D. W. F., and <Editors> Sorensen, H. 1985. rapeseed-induced liver haemorrhage syndrome in in-lay hens. 148-158.
- Drug** Wijnbergen-Buijen van Weelderden, M. and van Mullem, P. J. 1983. histological investigation of the effect of a controlled-released anti-inflammatory drug on exposed inflamed dog pulps. *Biomaterials* 4(3): 165-9.
- Gene** Wilde Craig G(A), Hawkins Phil R, Coleman Roger T, Levine Wendy B, Delegeane Angelo M, Okamoto Penny M, Ito Laura Y, Scott Randy W, and Seilhamer Jeffrey J. 1994. cloning and characterization of human tissue inhibitor of metalloproteinases-3. *DNA and Cell Biology* 13(7): 711-718.
- FL** Wilde, R. de. 1980. influence of supplementing citruspectins to a diet with and without antibiotics on the digestibility of the pectins and the other nutrients in pigs. *Zeitschrift Fur Tierphysiologie, Tierernahrung Und Futtermittelkunde* 43(2): 109-116.
- CP** Wildman, R. E., Hopkins, R., Failla, M. L., and Medeiros, D. M. 1995. marginal copper-restricted diets produce altered cardiac ultrastructure in the rat. *Proceedings of the Society for Experimental Biology and Medicine*; 210
- Phys** Wildman, S. S., King, B. F(A), and Burnstock, G. 1999. modulatory activity of extracellular h+ and zn2+ on atp-responses at rp2x1 and rp2x3 receptors. *British Journal of Pharmacology* 128(2): 486-492.
- Unrel** Wilgram, G. F., Krawczyk, W. S., and Connolly, J. E. 1973. extraction of osmium zinc iodide staining material in keratinosomes. *Journal of Investigative Dermatology* 61(1): 12-21.
- FL** Wilhelmi, G. and Tanner, K. effect of riboflavin (vitamin b2) on spontaneous gonarthrosis in the mouse. *Z. Rheumatol. (1988)* 47(3): 166-72.
- FL** Wilhelmi, G. and Tanner, K. 1988. [effect of riboflavin (vitamin b2) on spontaneous gonarthrosis

in the mouse]. <original> einfluss von riboflavin (vitamin b2) auf die spontane gonarthrose der maus. *Zeitschrift Fur Rheumatologie* 47(3): 166-72.

- FL** Wilhelmi, G. and Tanner, K. 1988. influence of riboflavin on spontaneous gonarthrosis in the mouse. *Zeitschrift Fur Rheumatologie* 47(3): 166-172.
- Nut def** Wilkins, P. J., Grey, P. C., and Dreosti, I. E. plasma zinc as an indicator of zinc status in rats. *Brit. J. Nutr.* (1972) 27(1): 113-20.
- Gene** Wilkinson, D. G., Bhatt, S., Chavrier, P., Bravo, R., and Charnay, P. 1989. segment-specific expression of a zinc-finger gene in the developing nervous-system of the mouse. *Nature* 337(6206): 461-464.
- Unrel** Wilkinson, D. G. and Nieto, M. A. 1993. detection of messenger rna by in situ hybridization to tissue sections and whole mounts. *Methods in Enzymology* 225: 361-73.
- Unrel** Will, M., Barnard, J. A., Said, H. M., and Ghishan, F. K. 1985. fetal hydantoin syndrome: inhibition of placental folic acid transport as a potential mechanism for fetal growth retardation in the rat. *Research Communications in Chemical Pathology and Pharmacology* 48(1)
- Nut** Williams, J. E., Wagner, D. G., Walters, L. E., Horn, G. W., Waller, G. R., Sims, P. L., and Guenther, J. J. 1983. effect of production systems on performance, body composition and lipid and mineral profiles of soft tissue in cattle. *Journal of Animal Science* 57(4): 1020-1028.
- Nut def** Williams, R. B. intestinal alkaline phosphatase and inorganic pyrophosphatase activities in the zinc-deficient rat. *Brit. J. Nutr.* (1972) 27(1): 121-30.
- No Dose** Williams, R. B., Davies, N. T., and McDonald, I. the effects of pregnancy and lactation on copper and zinc retention in the rat. *Br. J. Nutr.* (1977) 38(3): 407-16 .
- CP** Williams, R. B., Demertzis, P., and Mills, C. F. 1973. the effects of dietary zinc concentration on reproduction in the rat. *Proceedings of the Nutrition Society* 32(1): 3A-4A.
- Nut def** Williams, R. B., Mills, C. F., and Davidson, R. J. 1973. relationships between zinc deficiency and folic acid status of the rat. *Proceedings of the Nutrition Society* 32(1): 2A-3A.
- Nut def** Williams, Richard Bell and Chesters, J. K. effects of early zinc deficiency on dna and protein synthesis in the rat. *Brit. J. Nutr.* (1970) 24(4): 1053-9.
- CP** Williams, Richard Bell and Chesters, J. K. effects of zinc deficiency on nucleic acid synthesis in the rat. *Trace Elem. Metab. Anim. Proc. WAAP (World Ass. Anim. Prod.)/IBP (Int. Biol. Progr.) Int. Symp.* (1970): Meeting Date 1969, 164-7. Editor(s): Mills, Colin F. Publisher: Livingstone, London, Engl..
- Nut def** Williams, Richard Bell and Mills, Colin F. experimental production of zinc deficiency in the rat. *Brit. J. Nutr.* (1970) 24(4): 989-1003.
- No Control** Williams, S. N., Miles, R. D., Ouart, M. D., and Campbell, D. R. 1989. short-term high level zinc feeding and tissue zinc concentration in mature laying hens. *Poult. Sci.* 68(4): 539-45 .
- No COC** Williams, Tony D. parental and first generation effects of exogenous 17.beta.-estradiol on reproductive performance of female zebra finches (*taeniopygia guttata*). *Horm. Behav.* (1999) 35(2): 135-143 CODEN: HOBEO; ISSN: 0018-506X.
- Unrel** Williams Tracy A, Barnes Kay, Kenny, A. John, Turner Anthony J, and Hooper Nigel M(A).

1992. a comparison of the zinc contents and substrate specificities of the endothelial and testicular forms of porcine angiotensin converting enzyme and the preparation of isoenzyme-specific antisera. *Biochemical Journal* 288(3): 875-881.
- CP** Williamson, P. S., Brown, E. C., Browning, J. D., Wollard, L. C., Thornton, W. H. Jr, O'dell, B. L., and Macdonald, R. S. 1997. decreased insulin-like growth factor-i (igf-i) receptor concentration and igf-i binding in small intestine of zinc-deficient rats. *FASEB Journal* 11(3): A194.
- BioX** Willis, T. W. and Tu, A. T. 1988. purification and biochemical characterization of atroxase, a nonhemorrhagic fibrinolytic protease from western diamondback rattlesnake venom. *Biochemistry* 27(13): 4769-77.
- BioX** Willis, Todd W. and Tu, Anthony T. purification and biochemical characterization of atroxase, a nonhemorrhagic fibrinolytic protease from western diamondback rattlesnake venom. *Biochemistry (1988)* 27(13): 4769-77.
- CP** Willson, R. L. 1987. vitamin, selenium, zinc and copper interactions in free-radical protection against ill-placed iron. *Proceedings Of The Nutrition Society* 46(1): 27-34.
- Unrel** Wilson, C. B. and Essig, T. H. 1970. *Environmental Status of the Hanford Reservation for January--June 1969*
- Nut def** Wilson, I. D., McClain, C. J., and Erlandsen, S. L. 1980. ileal paneth cells and iga system in rats with severe zinc deficiency: an immunohistochemical and morphological study. *Histochemical Journal* 12(4): 457-71.
- Nut def** Wilson, I. Dodd, McClain, Craig J., and Erlandsen, Stanley L. ileal paneth cells and iga system in rats with severe zinc deficiency: an immunohistochemical and morphological study. *Histochem. J. (1980)* 12(4): 457-71
- No Oral** Wilson, J. X., Lui, E. M. K., and Maestro, R. F. del. 1992 . development profiles of antioxidant enzymes and trace metals in chick embryo. *Mechanisms of Aging and Development*. 65(1): 51-64.
- No Dose** Wilson, John X., Lui, Edmund M. K., and Del Maestro, Rolando F. developmental profiles of antioxidant enzymes and trace metals in chick embryo. *Mech. Ageing Dev. (1992)* 65(1): 51-64
- Mix** Wilson, Mark E., Hagler, Winston M. Jr., Ort, Jon F., Cullen, John M., and Cole, Richard J. 1990. subacute toxicity of cyclopiazonic acid in broiler chicks fed normal and high zinc diets. *Biodeterior. Res. 3 [Proc. Meet. Pan Am. Biodeterior. Soc.3rd* : Meeting Date 1989, 151-60. Editor(s): Llewellyn, Gerald C.; O'Rear, Charles E. Publisher: Plenum, New York, N. Y. CODEN: 57HIA3.
- Unrel** Winberg J-O, Thatcher, D. R., and Mckinley-Mckee, J. S. alcohol dehydrogenase ec-1.1.1.1 from the fruit fly drosophila-melanogaster inhibition studies of the allelo enzymes slow alcohol dehydrogenase and ultra fast alcohol dehydrogenase. *Biochimica Et Biophysica Acta*. 704 (1). 1982. 17-25.
- In Vit** Winchurch, R. A., Togo, J., and Adler, W. H. supplemental zinc restores antibody formation in cultures of aged spleen cells. iii. impairment of il-2-mediated responses. *Clin. Immunol. Immunopathol. (1988)* 49(2): 215-22.
- In Vit** Winchurch, R. A., Togo, J., and Adler, W. H. 1988. supplemental zinc restores antibody formation in cultures of aged spleen cells. iii. impairment of ii-2-mediated responses. *Clinical*

- FL** Windisch, W. and Kirchgessner, M. adjustments of zn metabolism and of zn exchange kinetics in the whole body of 65zn labeled rats to varying levels of zn intake. part 1. study of the quantitative zn exchange in the metabolism of adult rats at physiologically adequate zn supplies. *J. Anim. Physiol. Anim. Nutr.* (1995) 74(1/2): 101-12.
- FL** Windisch, W. and Kirchgessner, M. calcium and zinc balance of zinc-65-labeled rats at deficient and moderately high calcium supplies. part 1. effect of a varying calcium supply on quantitative calcium and zinc exchange in the metabolism of adult rats. *J. Anim. Physiol. Anim. Nutr.* (1994) 72(4/5): 184-94.
- FL** Windisch, W. and Kirchgessner, M. distribution and exchange of zinc in different tissue fractions at deficient and excessive zinc supply. part 3. effect of different zinc supply on quantitative zinc exchange in the metabolism of adult rats. *J. Anim. Physiol. Anim. Nutr.* (1994) 71(3): 131-9.
- FL** Windisch, W. and Kirchgessner, M. distribution and exchange of zinc in tissues of zinc-65 labeled rats . part 2. studies of the quantitative zinc exchange in the metabolism of adult rats at physiologically adequate zinc supplies. *J. Anim. Physiol. Anim. Nutr.* (1995) 74(3): 113-22
- FL** Windisch, W. and Kirchgessner, M. distribution of calcium and zinc, and zinc exchange in tissues at deficient and moderately high calcium supplies. part 2. effect of differing calcium supplies on quantitative calcium and zinc exchange in the metabolism of adult rats. *J. Anim. Physiol. Anim. Nutr.* (1994) 72(4/5): 195-.
- FL** Windisch, W. and Kirchgessner, M. measurement of homeostatic adaptation of zinc metabolism to deficient and high zinc supply after an alimentary 65zinc labeling procedure. part 1. effect of different zinc supply on the quantitative zinc exchange in the metabolism of adult rats. *J. Anim. Physiol. Anim. Nutr.* (1994) 71(2): 98-107
- FL** Windisch, W. and Kirchgessner, M. 1999. quantitative zn exchange of (65)zn labeled adult rats at zn deficiency induced dietary phytate additions. <original> quantitativer zinkumsatz (65)zn markierter adulter ratten wahrend eines durch phytatzulagen induzierten zinkmangels. <original> proceedings of the society of nutrition physiology berichte der gesellschaft fur ernahrungsphysiologie. *Proceedings Of The Society Of Nutrition Physiology (Germany)* p 114. No. 8
- CP** Windisch, W. and Kirchgessner, M. 1995. recent results on zinc metabolic turnover in the adult rat model. *Mengen- Spurenelem. Arbeitstag., 15th* : 1-13. Editor(s): Anke, Manfred. Publisher: Verlag Harald Schubert, Leipzig, Germany. CODEN: 64QSAY.
- Nut def** Windisch, W. and Kirchgessner, M. tissue zinc distribution and exchange in adult rats at zinc deficiency induced by dietary phytate additions. part 2. quantitative zinc metabolism of 65-labelled adult rats at zinc deficiency. *J. Anim. Physiol. Anim. Nutr.* (1999) 82(2-3): 116-124
- Nut def** Windisch, W. and Kirchgessner, M. zinc absorption and excretion in adult rats at zinc deficiency induced by dietary phytate additions. part 1. quantitative zinc metabolism of 65zn-labelled adult rats at zinc deficiency. *J. Anim. Physiol. Anim. Nutr.* (1999) 82(2-3): 106-115
- FL** Windisch, W. and Kirchgessner, M. zinc excretion and the kinetics of zinc exchange in the whole body zinc at deficient and excessive zinc supply. part 2. effect of different zinc supply on quantitative zinc exchange in the metabolism of adult rats. *J. Anim. Physiol. Anim. Nutr.* (1994) 71(3): 123-30
- Nut def** Windisch, W., Kirchgessner, M., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. zinc

exchange in adult rats at different zinc supply. 351-355.

- FL** Windisch, W., Schwarz, F. J., Gruber, K., and Kirchgessner, M. 1998. effect of pharmacological dietary doses of zinc oxide on performance and fecal characteristics of weanling piglets. *Agribiological Research* 51(3): 277-285.
- Fate** Windisch, W., Zhao, L., and Kirchgessner, M. the effect of masson pine pollen on the quantitative zinc metabolism in 65zn-labeled growing rats. *Trace Elem. Electrolytes* (1996) 13(4): 186-189 CODEN: TEELEO; ISSN: 0946-2104.
- Fate** Windisch, Wilhelm and Kirchgessner, Manfred. 1997. calcium and zinc exchange in 65zn labeled rats at different levels of calcium supply. *Trace Elem. Man Anim.--9 Proc. Int. Symp., 9th* : Meeting Date 1996, 17-18. Editor(s): Fischer, Peter W. F. Publisher: National Research Council of Canada, Ottawa, Ont..
- Fate** Windisch, Wilhelm and Kirchgessner, Manfred. 1997. zinc exchange in 65zn labeled rats at physiologically adequate zinc supply. *Trace Elem. Man Anim.--9 Proc. Int. Symp., 9th* : Meeting Date 1996, 139-140. Editor(s): Fischer, Peter W. F. Publisher: National Research Council of Canada, Ottawa, Ont..
- Phys** Wine Robert N(A), Ku Warren W, Li Ling-Hong, and Chapin Robert E. 1997. cyclophilin a is present in rat germ cells and is associated with spermatocyte apoptosis. *Biology of Reproduction* 56(2): 439-446.
- Phys** Wing, A. C. M. 1993. the effects of whole wheat, wheat bran and zinc in the diet on the absorption and accumulation of cadmium in rats. *The British Journal Of Nutrition.* 69(1): 199-209.
- Mix** Wing, Ann Catherine Moberg. the effects of whole wheat, wheat bran and zinc in the diet on the absorption and accumulation of cadmium in rats. *Br. J. Nutr.* (1993) 69(1): 199-209 .
- CP** Wing, K., Hallmans, G., Nilsson, U., Sjostrom, R., and Wetter, L. a comparative study in rats of methods used for assessing the bioavailability of zinc and iron . *Trace Elements In Man And Animals : Tema 5 : Proceedings Of The Fifth International Symposium On Trace Elements In Man And Animals / Editors C.f. Mills, I. Bremner, & J.k. Chesters.* p. 686-688.
- Mix** Wing, Kenneth, Wetter, Lars, Hallmans, Goran, Nilsson, Ulf, and Sjostrom, Rolf. a comparative study in rats of measures of the availability of dietary zinc and iron. *Biol. Trace Elem. Res.* (1992) 34(2): 141-59 .
- Mix** Wing, Kenneth, Wing, Ann Catherine, Tidehag, Per, Hallmans, Goeran, Sunzel, Bo, and Sjoestroem, Rolf. the availability of iron, zinc and cadmium to rats from composite diets with different cereal grains. *Nutr. Res. (N. Y.)* (1995) 15(10): 1525-34 .
- Unrel** Winge, Dennis R. and Miklossy, Kathy Anne. differences in the polymorphic forms of metallothionein . *Arch. Biochem. Biophys.* (1982) 214(1): 80-8 .
- No Oral** Winge, Dennis R., Premakumar, R., and Rajagopalan, K. V. studies on the zinc content of cadmium-induced thionein. *Arch. Biochem. Biophys.* (1978) 188(2): 466-75
- Sed** Winger, P. V., Lasier, P. J., White, D. H., and Seginak, J. T. 2000. effects of contaminants in dredge material from the lower savannah river . *Arch. Environ. Contam. Toxicol.* 38(1): 128-136 .
- Unrel** Winick Jeffrey, Abel Ted, Leonard Mark W, Michelson Alan M, Chardon-Loriaux Isabelle,

- Holmgren Robert A, Maniatis Tom, and Engel James= Douglas(A). 1993. a gata family transcription factor is expressed along the embryonic dorsoventral axis in drosophila melanogaster. *Development (Cambridge)* 119(4): 1055-1065.
- Drug** Wink, C. S., Rossowska, M. J., Joseph, F. Jr, Yazdani, M., and Nakamoto, T. 1999. effects of caffeine on heart mitochondria in newborn rats. *Biology of the Neonate* 76(2): 114-9.
- Anat** Wink, C. S(A), Rossowska, M. J., and Nakamoto, T. 1996. effects of caffeine on bone cells and bone development in fast-growing rats. *Anatomical Record* 246(1): 30-38.
- In Vit** Winkler, A., Mahal, B., Zieglansberger, W., and Spanagel, R. 1999. accurate quantification of the mrna of nmdar1 splice variants measured by competitive rt-pcr. *Brain Research* 4(1): 69-81.
- Phys** Winkler, C. A., Kittelberger, A. M., and Schwartz, G. J. 1997. expression of carbonic anhydrase iv mrna in rabbit kidney: stimulation by metabolic acidosis. *American Journal Of Physiology*. 272(4,pt.2): F551-F560.
- In Vit** Winslow, J. W(A), Laramie, G. R., Raab, H. E., Soriano, R. E., Goodman, L., and Hammonds, R. G. 1997. secreted cu/zn superoxide dismutase: is an astrocyte-derived survival factor for hippocampal neurons in culture. *Society for Neuroscience Abstracts* 23(1-2): 891.
- FL** Wirth, Helmut, Gloor, M., and Swoboda, U. oral zinc therapy and sebaceous gland secretion. *Z. Hautkr. (1981)* 56(7): 447-51.
- Nut def** Wirth, J. J., Fraker, P. J., and Kierszenbaum, F. 1984. changes in the levels of marker expression by mononuclear phagocytes in zinc-deficient mice. *The Journal Of Nutrition*. 114(10): 1826-1833.
- IMM** Wirth, J. J., Fraker, P. J., and Kierszenbaum, F. zinc requirement for macrophage function: effect of zinc deficiency on uptake and killing of a protozoan parasite. *Immunology (1989)* 68(1): 114-19.
- CP** Wiseman, A. and Aggett, P. J. the binding of zinc to rabbit small intestinal brush border vesicles. *Trace Elements In Man And Animals : Tema 5 : Proceedings Of The Fifth International Symposium On Trace Elements In Man And Animals / Editors C.f. Mills, I. Bremner, & J.k. Chesters.* p. 397-399.
- Drug** Wisniewski, E. 1984. preventive and therapeutic applications of zinc in bovine dermatomycoses. *Bulletin of the Veterinary Institute in Pulawy* 27(1-4): 22-35.
- FL** Wisniewski, E. and Dziekonski, J. clinical form of parakeratosis of young cattle due to a relative deficiency of zinc in the food. *Medycyna Weterynaryjna.* 29 (2). 1973 101-102.
- FL** Wittwer, F., Contreras, P. A., Bohmwald, H., and Kinzel, I. 1990. [zinc administration in pregnant cows and their calves]. <original> efecto de la administracion de zinc en vacas parto y en sus terneros. *Archivos De Medicina Veterinaria.* V. 22(2) P. 191-196
- Unrel** Witzgall, R., O'Leary, E., Gessner, R., Ouellette, A. J., and Bonventre, J. V. 1993. kid-1, a putative renal transcription factor: regulation during ontogeny and in response to ischemia and toxic injury. *Molecular and Cellular Biology* 13(3): 1933-42.
- Phys** Witzgall Ralph(A), Obermueller Nicholas, Boelitz Ulrike, Calvet James P, Cowley Benjamin D Jr, Walker Cheryl, Kriz Wilhelm, Gretz Norbert, and Bonventre Joseph V. 1998. kid-1 expression is high in differentiated renal proximal tubule cells and suppressed in cyst epithelia. *American*

Journal of Physiology 275(6 PART 2): F928-F937.

- Phys** Wlostowski, T. 1992. on metallothionein, cadmium, copper and zinc relationships in the liver and kidney of adult rats. *Comparative Biochemistry and Physiology. C, Comparative Pharmacology*
- Food** Wlostowski Tadeusz and Chetnicki Wlodzimierz. 1994. the effect of supplementary food in winter on growth, maturation and tissue zn, cu, fe and ca concentrations in the bank vole, clethrionomys glareolus (schreber, 1870). *Polish Ecological Studies* 20(1-2): 17-32.
- Nut def** Wlostowski Tadeusz and Krasowska Alicja. 1994. the relationship between testicular zinc and some parameters of spermatogenesis in the free-living bank vole, clethrionomys glareolus (schreber, 1870). *Polish Ecological Studies* 20(1-2): 9-15 .
- Unrel** Woessner, J. Frederick Jr. 1996. regulation of matrilysin in the rat uterus. *Biochemistry and Cell Biology* 74(6): 777-784.
- FL** Wojcik, A., Burek, G., and Kowalczyk, A. 1989. [toxic-dynamics of lead compound and zinc compound in the evaluation of experimental animal behavior]. <original> toksykodynamika związku ołowiu i związku cynku w ocenie zachowania sie zwierzat doswiadczalnych. *Annales Universitatis Mariae Curie-Skłodowska. Sectio D: Medicina*; 44
- Mineral** Wojcik, S., Niedzwiadek, T., and Adamczyk, M. 1999. usefulness of mineral feeds for dairy cows. *Biuletyn Naukowy Przemyslu Paszowego* 38(1/4): 67-75.
- FL** Wojcik, S. and Plaur, K. 1983. effect of zn bacitracin and flavomycin on fattening performance ofchickens given diets with different protein and energy contents. *Roczniki Naukowe Zootechniki* 10(2): 253-265.
- Unrel** Wojcinski, Z. W., Houston, B., Gragtmans, B., Rogers, J., Piscopo, I., and Baker, K. 1999. a spontaneous corneal change in juvenile wistar rats. *Journal of Comparative Pathology* 120(3): 281-94.
- Drug** Wolf, A. M. 1987. zinc-responsive dermatosis in a rhodesian ridgeback. *Veterinary Medicine* 82(9): 908-912.
- Fate** Wolf, G., Schutte, M., and Romhild, W. 1984. uptake and subcellular distribution of 65zinc in brain structures during the postnatal development of the rat. *Neuroscience Letters* 51(2): 277-80.
- Abstract** Wolf, J. L. and Hitchcock, J. P. 1996. effect of copper on the performance and plasma, copper, iron and zinc concentrations of 5 week weaned pigs. *Journal of Animal Science* 74(SUPPL. 1): 7.
- FL** Wolf, P., Bayer, G., Kamphues, J., and Pallauf, J. ed. 1997. investigations on the nutritive value of typical seeds and ingredients for small pet birds. <original> futtermittelkundliche untersuchungen zu den wichtigsten saemereien und saaten fuer ziervoegel. proceedings of the society of nutrition physiology. <original> berichte der gesellschaft fuer ernahrungsphysiologie. P. 114. No. 6
- Nut** Wolter, R. the feeding of sporting dogs. *Recueil De Medecine Veterinaire De L'Ecole D'Alfort*. 165 (6-7). 1989. 585-604.
- Rev** Wolter, R. nutrition of sport animals. *Science & Sports*. 2 (2). 1987. 63-94.

- Nut def** Wolter, R. 1996. osteochondrosis and feeding in the horse. *Pratique Veterinaire Equine* 28(2): 85-96.
- Nut def** Wolter, R. 1996. osteochondrosis and nutrition in dogs. *Pratique Medicale & Chirurgicale De L'Animal De Compagnie* 31(1): 59-67.
- Sludge** Wong, M. H., Chu, L. M., and Chan, W. C. the effects of heavy metals and ammonia in sewage sludge and animal manure on the growth of chlorella-pyrenoidosa. *Environmental Pollution Series A Ecological and Biological*. 34 (1). 1984. 55-72.
- Drug** Wong, S. H., Cho, C. H., and Ogle, C. W. 1986. protection by zinc sulphate against ethanol-induced ulceration: preservation of the gastric mucosal barrier. *Pharmacology* 33(2): 94-102.
- Unrel** Wong, W. W., Hachey, D. L., Feste, A., Leggitt, J., Clarke, L. L., Pond, W. G., and Klein, P. D. 1991. measurement of in vivo cholesterol synthesis from 2h2o: a rapid procedure for the isolation, combustion, and isotopic assay of erythrocyte cholesterol. *Journal of Lipid Research* 32(6): 1049-1056.
- No Oral** Woo Patrick C Y, Kaan Sheung K, and Cho Chi H(A). 1995. evidence for potential application of zinc as antidote to acetaminophen-induced hepatotoxicity. *European Journal of Pharmacology Environmental Toxicology and Pharmacology Section* 5(3): 217-224.
- Mix** Woo, William, Gibbs, Dwayne L., Hooper, Philip L., and Garry, Philip J. zinc and lipid metabolism. *Am. J. Clin. Nutr.* (1981) 34(1): 120-1 .
- Mix** Wood, B. H., Wood, C. W., Yoo, K. H., Yoon, K. S., and Delaney, D. P. nutrient accumulation and nitrate leaching under broiler litter amended corn fields. *Commun. Soil Sci. Plant Anal.* (1996) 27(15-17): 2875-2894.
- No COC** Wood, S. P., Blundell, T. L., Wollmer, A., Lazarus, N. R., and Neville, R. W. 1975. the relation of conformation and association of insulin to receptor binding; x-ray and circular-dichroism studies on bovine and hystricomorph insulins. *European Journal of Biochemistry* 55(3): 531-42.
- Unrel** Woodhouse, B. M., Savage, N. W., and Monsour, F. N. 1991. radiographic evaluation of intraosseous implants of endodontic materials. *Oral Surgery, Oral Medicine, and Oral Pathology* 71(2): 218-22.
- Fate** Woods, A. H., O'Bar, P. R., and Waite, S. L. 1970. trace metal behaviour in rabbits after whole-body irradiation. *International Journal of Applied Radiation and Isotopes* 21(7): 389-94.
- Unrel** Woods, R. L., Kildea, P. M., Gabriel, S. A., and Freilich, L. S. 1984. a histologic comparison of hydron and zinc oxide-eugenol as endodontic filling materials in the primary teeth of dogs. *Oral Surgery, Oral Medicine, and Oral Pathology* 58(1): 82-93.
- Abstract** Woodworth, J. C(A), Tokach, M. D(A), Goodband, R. D(A), O'quinn, P. R(A), and Fakler, T. M. 1998. influences of added zinc from zinc oxide on starter pig performance. *Journal of Dairy Science* 81(SUPPL. 1): 158.
- Abstract** Woodworth, J. C(A), Tokach, M. D(A), Nelssen, J. L(A), Goodband, R. D(A), Oquinn, P. R(A), and Fakler, T. M. 1999. the effects of added zinc from zinc sulfate or zinc sulfate/zinc oxide combinations on weanling pig growth performance. *Journal of Animal Science* 77(SUPPL. 1): 61.
- Abstract** Woodworth, J. C(A), Tokach, M. D(A), Nelssen, J. L(A), Goodband, R. D(A), and Sawyer, J.

- T(A). 1999. the effects of different zinc oxide sources on weanling pig growth performance. *Journal of Animal Science* 77(SUPPL. 1): 177.
- Abstract** Woodworth, J. C(A), Tokach, M. D(A), Nelssen, J. L(A), Goodband, R. D(A), Sawyer, J. T(A), and Fakler, T. M. 1999. the interactive effects of zinc source and feed grade antibiotic on weanling pig growth performance. *Journal of Animal Science* 77(SUPPL. 1): 177.
- Abstract** Worman, J. J. and Jensen, W. P. prairie-dog control in south-dakota usa an overview. 66TH ANNUAL MEETING OF THE SOUTH DAKOTA ACADEMY OF SCIENCE, VERMILLION, S.D., USA, APRIL, 1981. *PROC S D ACAD SCI.* 60 (0). 1981 (Recd. 1982). 184.
- Abstract** Worthington, B. S., Alvares, O. F., and Ahmed, S. effects of protein deficiency and zinc deficiency on the parotid gland of the rat. *FED PROC. Federation Proceedings.* 37 (3). 1978 585
- HHE** Worthington-Roberts, B. 1985. the role of nutrition in pregnancy course and outcome. *Journal of Environmental Pathology, Toxicology and Oncology* 5(6)
- Carcin** Woster, A. D., Failla, M. L., Taylor, M. W., and Weinberg, E. D. 1975. brief communication: zinc suppression of initiation of sarcoma 180growth. *Journal of the National Cancer Institute* 54(No.4): 1001-1003.
- No Oral** Woster, Allen D., Failla, Mark L., Taylor, Milton W., and Weinberg, Eugene D. zinc suppression of initiation of sarcoma 180 growth. *J. Natl. Cancer Inst. (1975)* 54(4): 1001-3 .
- Nut def** Wouwe, J. P. van and Veldhuizen, M. 1994. dietary subacute zinc deficiency and potassium metabolism. *Biological Trace Element Research.* 46(3): 261-268.
- Nut def** Wouwe, J. P. van and Veldhuizen, M. 1996. growth characteristics in laboratory animals fed zinc-deficient, orhistidine-supplemented diets. *Biological Trace Element Research* 55(1/2): 71-77.
- CP** Wouwe, J. P. van, Veldhuizen, M., and Hamer, C. J. A. van den. oral 65zn loading test in rats fed iri-ob diet with various zn concentrations. *New Developments In Biosciences : Their Implications For Laboratory Animal Science : Proceedings Of The Third Symposium, Amsterdam, The Nethrlands, 1-5 June 1987 / Edited By Anton C. Beyneen And Henk A. Solleveld.* p. 419-423.
- Nut** Wouwe, J. P. van, Veldhuizen, M., Hamer, J. A. van den, and Goeij, J. J. M. de. 1990. discrimination between low dietary zinc and endotoxin exposure: a modelstudy on weaning rats. *Pediatric Research* 28(4): 332-335.
- No Oral** Wright, A. and Wilson, J. F. 1983. absorption of alpha msh from sub cutaneous and intra peritoneal sites in the rat. *PEPTIDES (FAYETTEVILLE).* 4(1): 5-10.
- Unrel** Wright, A. J. and Southon, S. 1997. scientific opportunities ... 'taken at the flood'. *British Journal of Nutrition* 78(3): 353-5.
- Alt** Wright, D. E. Towers N. R. and Sinclair D. P. 1978. intake of zinc sulphate in drinking water by grazing beef cattle. *N.Z.J.Agric.Res.* 21(2): 215-221.
- No Oral** Wrzotek, Monika Anna. the effect of zinc on vitamin d3-induced cardiac necrosis. *J. Mol. Cell. Cardiol. (1985)* 17(2): 109-17 .
- FL** Wu C-L. zinc and manganese requirements of tsai-ya ducklings and factors affecting requirements. *Journal of the Agricultural Association of China New Series.* 0 (119). 1982

(*Recd.* 1983). 75-85.

- HHE** Wu, C. T., Lee, J. N., Shen, W. W., and Lee, S. L. 1984. serum zinc, copper, and ceruloplasmin levels in male-alcoholics. *Biological Psychiatry* 19(9): 1333-1338.
- Unrel** Wu, H.-B., Lee, C. Young, and Rechler, M. M. proteolysis of insulin-like growth factor binding protein-3 in serum from pregnant, non-pregnant, and fetal rats by matrix metalloproteinases and serine proteases. *Horm. Metab. Res.* (1999) 31(2/3): 186-191 CODEN: HMMRA2; ISSN: 0018-5043.
- Nut def** Wu, Jiahui, He, Zehua, and Xu, Dixuong. effect of zinc deficiency on thymus development and its mechanism in rats. *Yingyang Xuebao* (1998) 20(3): 303-307
- Nut def** Wu, Jiahui, Ren, Rongna, Wei, Wen, and Xu, Dixuing. effect of zinc deficiency on the brain development of rats. *Yingyang Xuebao* (1995) 17(2): 168-73.
- Nut def** Wu, Jiahui, Wei, Wen, Xu, Dixiong, and Shi, Yuan. effects of zinc deficiency on development and metabolism of the liver in rats. *J. Med. Coll. PLA* (1997) 12(1): 44-46
- Nut def** Wu, Jiahui, Wei, Wun, and Wu, Suibing. effect of zinc deficiency on cell cycle, dna and protein contents of thymus and spleen. *Yingyang Xuebao* (1994) 16(3): 269-73
- IMM** Wu, Jiahui, Wu, Shuibing, Bai, Jiasi, and Kong, Xiangying. studies of the effects of dietary zinc on the immune organs and cellular immunity in the rat. *J. Med. Coll. PLA* (1994) 9(4): 274-8.
- Nut def** Wu, Jiahui, Wu, Shuibing, and Kong, Xiangying. effects of zinc on immune organs in rats. *Yingyang Xuebao* (1994) 16(1): 44-50 .
- Nut** Wu, Jiahui, Wu, Shuibing, and Li, Caian. the effect of zinc on proliferation of cells during cell cycle in immune system organs - analysis using flow cytometry. *Zhongguo Mianyixue Zazhi* (1994) 10(5): 278-81.
- FL** Wu, Jiahui, Xu, Dixong, and He, Zehua. effects of high dietary zinc on the development of thymus and its mechanism in rats. *Yingyang Xuebao* (1997) 19(1): 39-42.
- FL** Wu, Jiahui, Zhang, Chunyong, and Xu, Dixong. the influence of zinc on growth, development and metabolism of nucleic acids and proteins of tissues in rats. *Yingyang Xuebao* (1995) 17(4): 363-7.
- Nut def** Wu, John Y. J., Reaves, Scott K., Wang, Yi Ran, Wu, Yan, Lei, Polin P., and Lei, Kai Y. zinc deficiency decreases plasma level and hepatic mrna abundance of apolipoprotein a-i in rats and hamsters. *Am. J. Physiol.* (1998) 275(6, Pt. 1): C1516-C1525.
- Unrel** Wu, L. N., Genge, B. R., Sauer, G. R., and Wuthier, R. E. 1996. characterization and reconstitution of the nucleational complex responsible for mineral formation by growth plate cartilage matrix vesicles. *Connective Tissue Research* 35(1-4): 309-15.
- Unrel** Wu, L. N., Yoshimori, T., Genge, B. R., Sauer, G. R., Kirsch, T., Ishikawa, Y., and Wuthier, R. E. 1993. characterization of the nucleational core complex responsible for mineral induction by growth plate cartilage matrix vesicles. *Journal of Biological Chemistry* 268(33): 25084-94.
- No COC** Wu, M. S. W., Cook, M. E., and Smalley, E. B. 1990. prevention of thiram-induced dyschondroplasia by copper. *Nutrition Research* 10(5): 555-566.

- Unrel** Wu, T. J., Pierotti, A. R., Jakubowski, M., Sheward, W. J., Glucksman, M. J., Smith, A. I., King, J. C., Fink, G., and Roberts, J. L. 1997. endopeptidase ec 3.4.24.15 presence in the rat median eminence and hypophysial portal blood and its modulation of the luteinizing hormone surge. *Journal of Neuroendocrinology* 9(11): 813-22.
- CP** Wu, T. J., Tolchin, B. D., Janssen, W. G., King, J. C., and Roberts, J. L. 1997. estradiol regulation of the metalloendopeptidase ec 3.4.24.15 in the rat hypothalamus: an immunocytochemistry study. *Society for Neuroscience Abstracts* 23(1-2): 2052.
- Surv** Wu, T. Y. and Weng, P. S. 1977. determination of radium-226 in bone of the native taiwan buffalo and in environmental samples of north taiwan power reactor site. *HEALTH PHYSICS* 32(6): 565-567.
- No COC** Wu, W., Cook, M. E., Chu, A., and Smalley, E. B. 1993. tibial dyschondroplasia of chickens induced by fusarochromanone, a mycotoxin. *Avian Diseases*. 37(2): 302-309.
- Unrel** Wu Weidong(A), Cook Mark E, Chu Qili, and Smalley Eugene B. 1993. tibial dyschondroplasia of chickens induced by fusarochromanone, a mycotoxin. *Avian Diseases* 37(2): 302-309.
- Nut** Wu, X. and Et Al. study of the relative biological availability of black rice bran iron by means of hemoglobin regeneration in rats. *Journal of Xi'An Medical University*. 9 (3). 1988. 235-238.
- FL** Wu Xiuyun (Qinghai Inst. of Animal Science, Xining China. 1995. study on the optimal zinc level in diet for broilers. *Chinese Journal of Animal Science*. V. 3(1) P. 10-11
- Unrel** Wu Yvonne Y and Bradshaw Ralph A(A). 1993. effect of nerve growth factor and fibroblast growth factor on pc12 cells: inhibition by orthovanadate. *Journal of Cell Biology* 121(2): 409-422.
- Unrel** Wuryastuti, H., Stowe, H. D., and Miller, E. R. 1991. the influence of gestational dietary calcium on serum 1,25-dihydroxy-cholecalciferol in sows and their pigs. *Journal of Animal Science* 69(2): 734-739.
- CP** Wuthier, R. E., Wu, L. N. Y., Sauer, G. R., Genge, B. R., Yoshimori, T., and Ishikawa, Y. mechanism of matrix vesicle calcification characterization of ion channels and the nucleational core of growth plate vesicles. *FIFTH INTERNATIONAL CONFERENCE ON CELL-MEDIATED CALCIFICATION AND MATRIX VESICLES, HILTON HEAD, SOUTH CAROLINA, USA, NOVEMBER 16-20, 1991. BONE MINER.* 17 (2). 1992. 290-295.
- Alt** Wyatt, R. D., Neathery, M. W., Moos, W. H., Miller, W. J., Gentry, R. P., and Ware, G. O. 1985. effects of dietary aflatoxin and zinc on enzymes and other bloodconstituents in dairy calves. *Journal of Dairy Science* 68(2): 437-442.
- Plant** Wyen, N. V., Erdei, S., and Farkas, G. L. 1971. isolation from avena leaf tissues of a nuclease with the same type of specificity towards rna and dna. accumulation of the enzyme during leaf senescence. *Biochimica Et Biophysica Acta* 232(3): 472-83.
- Nut** Wylie, L. M. and Hocking, P. M. Roslin Institute Edinburgh Roslin Midlothian EH25 9PS United Kingdom. 1997. effect of dietary zinc on breast feathering in growing turkeys. *British Poultry Science*. V. 38(Supplement) P. S42
- CP** Wysocka-Solowiej B(A), Kinalski, M., Zarzycki W(A), Gorski, J., and Kinalska, I. A. 1997. vitamin e treatment increase cuzn-dismutase activity in diabetic rat pregnancy. *Diabetologia* 40(SUPPL. 1): A234.

- Nut def** Xia, J., Browning, J. D., and O'dell, B. L. 1995. relationship of plasma membrane sulfhydryl concentration to zinc deficiency pathology. *FASEB Journal* 9(4): A867.
- Nut def** Xia, Jinming, Browning, Jimmy D., and O'Dell, Boyd L. decreased plasma membrane thiol concentration is associated with increased osmotic fragility of erythrocytes in zinc-deficient rats. *J. Nutr.* (1999) 129(4): 814-819.
- Nut def** Xia, Jinming and O'Dell, Boyd L. zinc deficiency in rats decreases thrombin-stimulated platelet aggregation by lowering protein kinase c activity secondary to impaired calcium uptake. *J. Nutr. Biochem.* (1995) 6(12): 661-6.
- No COC** Xia, Junjie, Zhang, Zhaodi, Jiang, Yun, Yang, Kedi, and Lu, Cuirong. effects of boron trifluoride-triethanolamine on reproductive system of male rabbits. *Gongye Weisheng Yu Zhiyebing* (1989) 15(3): 142-5.
- Nut** Xian, Jinming, Ye, Guangjun, and Si, Qi. effects of lysine, phenylalanine, tyrosine, and valine on the kinetics of zinc absorption in ileum of rat. *Yingyang Xuebao* (1992) 14(3): 229-34 .
- Unrel** Xiao Lihua(A) and Herd, R. P. 1993. quantitation of giardia cysts and cryptosporidium oocysts in fecal samples by direct immunofluorescence assay. *Journal of Clinical Microbiology* 31(11): 2944-2946.
- Unrel** Xiao, Q., Castillo, S. O., and Nikodem, V. M. 1996. distribution of messenger rnas for the orphan nuclear receptors nurr1 and nur77 (ngfi-b) in adult rat brain using in situ hybridization. *Vol. 75, No. 1, Pp. 221-230 Neuroscience*
- Nut def** Xie, Liangmin, Zhao, Faji, Guo, Junsheng, and Xi, Jianhua. effects of zn deficiency and supplementation on the concentrations of zn, fe, and cu in developing rat brain. *Yingyang Xuebao* (1995) 17(2): 174-9 .
- Nut def** Xie, Liangmin, Zhao, Faji, and Guo, Junsheng. effect of dietary zinc deficiency on nos activity and cgmp level of certain regions in developing rat brain. *Yingyang Xuebao* (1995) 17(3): 288-92.
- Phys** Xie Xinmin and Smart Trevor G(A). 1994. modulation of long-term potentiation in rat hippocampal pyramidal neurons by zinc. *Pfluegers Archiv European Journal of Physiology* 427(5-6): 481-486.
- Nut def** Xin, Hualing, Jiang, Zhiming, Han, Tongxi, Gong, Shuming, and Gao, Shuangbing. study on the immune function and antioxidation effect of zinc in mice. *Zhongguo Gonggong Weisheng Xuebao* (1998) 17(3): 161-162.
- Nut def** Xu, Bo, Zheng, Deyuan, Qian, Youqiong, and Wu, Kangmin. effects of zinc deficiency and vitamin d deficiency on bone calcification and development of rats. *Huaxi Yike Daxue Xuebao* (1992) 23(3): 288-92.
- Nut** Xu, C., Wensing, T., and Beynen, A. C. 1997. the effects of dietary soybean versus skim milk protein on plasma and hepatic concentrations of zinc in veal calves. *Journal of Dairy Science* 80(9): 2156-2161.
- Nut** Xu, Guangfei and Liu, Yi. effect of dam taurine-depletion and taurine-supplementation on the development of the offspring brain. *Yingyang Xuebao* (1998) 20(1): 58-62 .
- FL** Xu, He, Zhao, Faji, Guo, Junsheng, and Ling, Changquan. effect of zinc on the cellular immunity and nk cell activity in acute heat stressed rats. *Weisheng Yanjiu* (1998) 27(5): 289-291.

- FL** Xu Jianxiong, Zhang Hao (Shanghai Agricultural Coll. (China). Dept. of Animal Science), and Xu Yongfa. 1994. effect of short-period feeding of zinc oxide supplemented diet on laying performance and egg yolk zinc content of laying hens. *Journal of Shanghai Agricultural College*. V. 12(4) P. 287-291
- Gene** Xu, L. H., Yang, X., Craven, R. J., and Cance, W. G. 1998. the cooh-terminal domain of the focal adhesion kinase induces loss of adhesion and cell death in human tumor cells. *Cell Growth & Differentiation* 9(12): 999-1005.
- Gene** Xu Lin, Wallen Robert, Patel Vinyas, and Depinho Ronald A(A). 1993. role of first exon/intron sequences in the regulation of myc family oncogenic potency. *Oncogene* 8(9): 2547-2553.
- Unrel** Xu, R. X., Pawelczyk, T., Xia, T. H., and Brown, S. C. 1997. nmr structure of a protein kinase c-gamma phorbol-binding domain and study of protein-lipid micelle interactions. *Biochemistry* 36(35): 10709-17.
- CP** Xu, Z. and Bray, T. M. interaction of increased microsomal oxygen radicals and the stability of cytochrome p450 in dietary zinc deficient rats. DAVIES, K. J. A. (ED.). *OXIDATIVE DAMAGE AND REPAIR: CHEMICAL, BIOLOGICAL AND MEDICAL ASPECTS; 5TH BIENNIAL MEETING OF THE INTERNATIONAL SOCIETY FOR FREE RADICAL RESEARCH, PASADENA, CALIFORNIA, USA, NOVEMBER 14-20, 1990. XXVIII+899P. PERGAMON PRESS: OXFORD, ENGLAND, UK; ELMSFORD, NEW YORK, USA. ILLUS. ISBN 0-08-041749-3. 0 (0). 1991. 757-761.*
- Nut def** Xu, Z., Chen, G., and Bray, T. M. esr spin trapping study of the effect of oxidative stress and dietary zinc deficiency on free radical production in-vivo. *75TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ATLANTA, GEORGIA, USA, APRIL 21-25, 1991. FASEB (FED AM SOC EXP BIOL) J. 5 (5). 1991. A941.*
- Nut def** Xu, Z. M. and Bray, T. M. effect of dietary zinc deficiency induced free radical production on the stability of microsomal cytochrome p-450 enzyme system in rats. *Trace Elem. Man Anim. 7: Monogr. Proc., Round Tables Discuss. Int. Symp., 7th : Meeting Date 1990, 17-25-17/26.* Editor(s): Momcilovic, Berislav. Publisher: Inst. Med. Res. Occup. Health Univ. Zagreb, Zagreb, Yugoslavia..
- Nut def** Xu, Zhaoming. 1993. the effects of dietary zinc deficiency on the hepatic microsomal p450 enzyme system in rats. Avail.: NLC Order No. DANN84780 From: Diss. Abstr. Int. B 1994. 54. 12, Pt. 1. 6140. 223 pp.
- Nut def** Xu, Zhaoming, Squires, E. James, and Bray, Tammy M. effects of dietary zinc deficiency on the expression of hepatic microsomal cytochrome p450 2e1 in rats. *J. Nutr. Biochem. (1994) 5(6): 308-13.*
- Nut def** Xue, Jinghui and Guo, Renyu. effects of dithizone on zinc metabolism in maternal rats and the development of brain of their pups. *Xi'an Yike Daxue Xuebao (1992) 13(2): 116-18.*
- Meth** Xun, Xiaolin, Yu, Shouyang, and Bao, Chunyi. application of radioisotope 65zn tracing method in the study of the interrelationship between dietary protein and zinc utilization in rats. *Yingyang Xuebao (1996) 18(3): 243-249.*
- FL** Xun, Xiaolin, Yu, Shouyang, and Bao, Chunyi. nitrogen retention affected by different levels of dietary zinc and protein in rats. *Zhongguo Gonggong Weisheng Xuebao (1996) 15(2): 73-75* .
- FL** Xun Xiaolin Yu Shouyang and Bao Chunyi. 1996. the appliance of radioisotope 65zn tracing

method in the study of the interrelationship between dietary protein and zinc utilization in rats. *Acta Nutrimenta Sinica* 18(3): 243-249.

- Nut** Yadav, K. K. and Mandokhot, V. M. 1988. effect of sulphur supplementation on the performance of stall-fed nallilams, growth responses, nutrients and minerals utilization. *Indian Journal of Animal Sciences* 58(7): 843-848.
- HHE** Yadrick, M. K., Kenney, M. A., and Winterfeldt, E. A. 1989. iron, copper, and zinc status - response to supplementation with zinc or zinc and iron in adult females. *American Journal Of Clinical Nutrition* 49(1): 145-150.
- FL** Yakubovskii, M. V. 1982. the use of a prophylactic premix against nematode infections in piglets. *Trudy Belorusskogo Nauchno-Issledovatel'Skogo Instituta Eksperimental'noi Veterinarii. (Veterinarnaya Nauka -- Proizvodstvu)* 19: 89-92.
- No COC** Yalcin, S., Kucukersan, K., and Kucukersan, S. 1995. the effect of monensin added to the diet of fattening lambs on some blood and rumen fluid metabolites. *Turk Veterinerlik Ve Hayvancilik Dergisi* 19(4): 297-302.
- Alt** Yamada, G., Nakamura, S., Haraguchi, R., Sakai, M., Suzuki, K., Miyado, K., Hasuwa, H., Ogino, Y., Minami, T., Tohno, Y., Blum, M. , and Shultz, L. D. aberrant regulation of bone trace elements in motheaten and osteopetrosis mutant mice. *Cell. Mol. Biol. (Paris) (1998)* 44(2): 315-319
- No Dose** Yamada, G., Nakamura, S., Haraguchi, R., Terai, K., Nomura, S., Kitamura, Y., Minami, T., Yamada, M. O., Suzuki, S., Izumi, H., and Nagata, R. microphthalmia (mi) mice display an aberrant bone trace element composition. *Biol. Trace Elem. Res. (1998)* 62(1 and 2): 75-82.
- No Dose** Yamada, G., Sugimura, K., Nakamura, S., Yamada, M-O., Tohno, Y., Maruyama, I., Kitajima, I., and Minami, T. trace element composition and histological analysis of rat bones from the space shuttle . *Life Sci. (1997)* 60(9): 635-642.
- Alt** Yamada, Y., Fushimi, H., Inoue, T., Matsuyama, Y., Kameyama, M., Minami, T., Okazaki, Y., Noguchi, Y., and Kasama, T. 1995. effect of eicosapentaenoic acid and docosahexaenoic acid on diabetic osteopenia. *Diabetes Research and Clinical Practice* 30(1): 37-42.
- Nut def** Yamagishi, H., Uehara, M., and Goto, S. the alteration of hepatic copper binding protein in iron-deficient rat. *Biomed. Res. Trace Elem. (1991)* 2(2): 189-90.
- Phys** Yamaguchi, M. the role of zinc as a stimulating factor in bone formation. *EISEI KAGAKU. Eisei Kagaku.* 36 (2). 1990. 85-99.
- Org Met** Yamaguchi, M. and Gao YingHua (Laboratory of Endocrinology and Molecular Metabolism, Graduate School of Nutritional Sciences University of Shizuoka 52-1 Yada Shizuoka City 422 Japan. 1998. potent effect of zinc acexamate on bone components in the femoral-metaphyseal tissues of elderly female rats. *General Pharmacology.* V. 30(3) P. 423-427
- In Vit** Yamaguchi, M. and Oishi, H. 1989. effect of 1,25-dihydroxyvitamin d3 on bone metabolism in tissue culture. enhancement of the steroid effect by zinc. *Biochemical Pharmacology* 38(20): 3453-9.
- Rev** Yamaguchi, M. and Okada, S. 1983. action of zinc on calcium metabolism and its mechanism in rats. *EISEI KAGAKU* VOL. 29, NO. 1: p. 44.
- Mix** Yamaguchi, M. and Sakashita, T. 1986. enhancement of vitamin d3 effect on bone metabolism in

weanling rats orally administered zinc sulphate. *Acta Endocrinologica* 111(2): 285-8.

- Acu** Yamaguchi, Masayoshi. atropine inhibits bone resorption induced by high dose of zinc in rats. *Toxicol. Lett.* (1983) 17(3-4): 259-61.
- Drug** Yamaguchi, Masayoshi. 1995. .beta.-alanyl-l-histidinato zinc: a potent activator in bone formation. *Curr. Med. Chem.* (1995) 1(5): 356-65 .
- Acu** Yamaguchi, Masayoshi, Katayama, Kumiko, and Okada, Shoji. hypocalcemic effect of zinc and its mechanism in rats. *J. Pharmacobio-Dyn.* (1981) 4(9): 656-63 .
- Acu** Yamaguchi, Masayoshi, Kura, Masatsugu, and Okada, Shoji. zinc accumulation and succinate dehydrogenase activation in hepatic mitochondria of rats orally administered zinc sulfate. *Chem. Pharm. Bull.* (1981) 29(8): 2370-4 .
- Acu** Yamaguchi, Masayoshi, Kura, Masatsugu, and Okada, Shoji. zinc metabolism in the liver of rats orally administered zinc sulfate. *Chem. Pharm. Bull.* (1980) 28(12): 3595-600 .
- Mix** Yamaguchi, Masayoshi, Mochizuki, Atsuyo, and Okada, Shoji. stimulation of bone resorption by comparatively high dose of zinc in rats. *J. Pharmacobio-Dyn.* (1982) 5(7): 501-4.
- Org Met** Yamaguchi, Masayoshi and Ozaki, K. a new zinc compound, .beta.-alanyl-l-histidinatozinc, stimulates bone growth in weanling rats. *Res. Exp. Med.* (1990) 190(2): 105-10 .
- No Dose** Yamaguchi, Masayoshi, Ozaki, Kayoko, and Suketa, Yasunobu. alteration in bone metabolism with increasing age: effects of zinc and vitamin d3 in aged rats. *J. Pharmacobio-Dyn.* (1989) 12(2): 67-73 .
- Mix** Yamaguchi, Masayoshi and Sakashita, Teruyuki. enhancement of vitamin d3 effect on bone metabolism in weanling rats orally administered zinc sulfate. *Acta Endocrinol. (Copenhagen)* (1986) 111(2): 285-8 .
- Acu** Yamaguchi, Masayoshi and Takahashi, Kouzi. calcitonin inhibits the increase in bone acid phosphatase activity by high dose of zinc in rats. *Toxicol. Lett.* (1983) 19(1-2): 155-7 .
- Acu** Yamaguchi, Masayoshi and Takahashi, Kouzi. decrease in insulin secretion related to hypocalcemia induced by a high dose of zinc in rats. *Toxicol. Lett.* (1984) 22(2): 175-80.
- Acu** Yamaguchi, Masayoshi, Takahashi, Kouzi, and Okada, Shoji. zinc-induced hypocalcemia and bone resorption in rats. *Toxicol. Appl. Pharmacol.* (1983) 67(2): 224-8 .
- Acu** Yamaguchi, Masayoshi and Yamaguchi, Rie. action of zinc on bone metabolism in rats . increases in alkaline phosphatase activity and dna content. *Biochem. Pharmacol.* (1986) 35(5): 773-7.
- In Vit** Yamamoto, Koji. 1995. sexual differences in the golgi apparatus of rat hepatocytes: three-dimensional analysis. *Cell & Tissue Research* 279(3): 459-463.
- Gene** Yamamoto, M., Ko, L. J., Leonard, M. W., Beug, H., Orkin, S. H., and Engel, J. D. 1990. activity and tissue-specific expression of the transcription factor nf-e1 multigene family. *Genes & Development* 4(10): 1650-62.
- Biom** Yamamoto, T. and Nozaki Taguchi, N. 1995. zinc protoporphyrin ix, an inhibitor of the enzyme that produces carbon monoxide, blocks spinal nociceptive transmission evoked by formalinjection in the rat. *Vol. 704, No. 2, Pp. 256-262* Brain Res.

- Mix** AMANE, Y., FUKINO, H., and IMAGAWA, M. 1977. suppressive effect of zinc on the toxicity of mercury. *CHEM PHARM BULL (TOKYO)* 25(7): 1509-1518.
- No Oral** Yamane, Yasuhiro and Koizumi, Tosiaki. some role of molybdenum on response of rats to stress induced by cadmium administration. *Kankyo Kagaku Kenkyu Hokoku (Chiba Daigaku) (1990)* : Volume Date 1989, 15, 1-2.
- CP** Yamani, K. A. O. Zagazig Univ. Egypt Faculty of Agriculture, Rashwan, A. A., and Magdy, M. M. 1997. effects of copper, zinc and tafla dietary supplementation on broiler performance. the proceedings of the international conference on animal... and health. P. 457-463
- Nut def** Yamasaki, Kazuhiro, Kaneko, Masae, Matsuda, Koichi, Sakata, Shigeko Fujimoto, and Tamaki, Nanaya. the correlation between feed-intake cycle and nutritional zinc-deficient status in rats. *J. Nutr. Sci. Vitaminol. (1999)* 45(5): 621-632.
- Biom** Yamasaki, Y., Matsuura, N., Shozuhara, H., Onodera, H., Itoyama, Y., and Kogure, K. 1995. interleukin-1 as a pathogenetic mediator of ischemic brain damage in rats [see comments]. *Stroke* 26(4): 676-80; discussion 681.
- HHE** Yamashiro, Osamu, Morimoto, Akio, Sakata, Yoshiyuki, Watanabe, Tatsuo, and Murakami, Naotoshi. febrile and metabolic tolerance to endotoxin and human recombinant interleukin-1.beta. in rabbits. *Am. J. Physiol. (1993)* 264(6, Pt. 2): R1180-R1185.
- CP** Yamashiro, S., Bast, T., Bray, T. M., and Bettger, W. J. effects of zn deficiency on thymus of growing rats. *Proceedings - Meeting - Electron Microscopy Society Of America.* 1987. v. 45 p. 864-865. ill.
- No COC** Yamashita, Atsushi, Hayashi, Norio, Sugimura, Yoshiki, Cunha, Gerald R., and Kawamura, Juichi. influence of diethylstilbestrol, leuprolerin (a luteinizing hormone-releasing hormone analog), finasteride (a 5.alpha.-reductase inhibitor), and castration on the lobar subdivisions of the rat prostate. *Prostate (N. Y.) (1996)* 29(1): 1-14.
- Nut def** Yanaga, M., Iwama, M., Takiguchi, K., Noguchi, M., and Omori, T. determination of trace elements in organs and tissues of zinc-deficient mice by instrumental neutron activation analysis. *J. Radioanal. Nucl. Chem. (1998)* 231(1-2): 187-189.
- Nut def** Yanagisawa, Hiroyuki, Nodera, Makoto, and Wada, Osamu. zinc deficiency aggravates tubulointerstitial nephropathy caused by ureteral obstruction. *Biol. Trace Elem. Res. (1998)* 65(1): 1-6.
- Anat** Yanai, T., Masegi, T., Kawada, M., Ishikawa, K., Fukuda, K., Yamazoe, K., Iwasaki, T., Ueda, K., and Goto, N. Department of Veterinary Pathology Faculty of Agriculture Gifu University Fifu 501-11 Japan. 1994. spontaneous vascular mineralization in the brains of cows. *Journal of Comparative Pathology.* V. 111(2) P. 213-219
- Prim** Yanai, T., Masegi, T., Ueda, K., Manabe, J., Teranishi, M., Takaoka, M., Matsunuma, N., Fukuda, K., Goto, N., and Fujiwara, K. 1994. vascular mineralization in the monkey brain. *Veterinary Pathology* 31(5): 546-52.
- No COC** Yang, Ben Shan, Ishii, Hiroshi, Satoh, Akira, and Kato, Norihisa. supplemental dietary cystine elevates kidney metallothionein in rats by a mechanism involving altered zinc metabolism. *J. Nutr. (1995)* 125(5): 1167-74 .
- No COC** Yang Ben-Shan, Yamazaki Michikazu, Wan Qin, and Kato Norihisa(A). 1996. comparison of the response of serum ceruloplasmin and cholesterol, and of tissue ascorbic acid, metallothionein, and

nonprotein sulfhydryl in rats to the dietary levels of cystine and cysteine. *Bioscience Biotechnology and Biochemistry* 60(12): 1933-1936.

- Phys** Yang C-L, Du X-H, Zou W-Z, and Chen, W. protective effect of zinc-induced metallothionein synthesis on gentamicin nephrotoxicity in rats. *Renal Failure*. 13 (4). 1991. 227-232.
- No COC** Yang, C. P., Chen, L. M., and Tseng, H. C. 1982. efficacies and residues of nine antibiotic feed additives in broilers production in subtropical taiwan. No. 118, Pp. 72-82 J. Agric. Assoc. China.
- Drug** Yang, Feili L. and DiSilvestro, Robert A. effects of dietary zinc restriction on bismuth induction of rat kidney metallothionein. *J. Nutr. Biochem.* (1996) 7(4): 196-9.
- No Oral** Yang, J. and Cherian, M. G. 1994. protective effects of metallothionein on streptozotocin-induced diabetes in rats. *Life Sciences* 55(1): 43-51.
- FL** Yang, Jilin and Cunnane, Stephen C. quantitative measurements of dietary and [1-14c]linoleate metabolism in pregnant rats : specific influence of moderate zinc depletion independent of food intake. *Can. J. Physiol. Pharmacol.* (1994) 72(10): 1180-5
- No Oral** Yang, Jingping and Cherian, M. George. protective effects of metallothionein on streptozotocin-induced diabetes in rats. *Life Sci.* (1994) 55(1): 43-51 .
- FL** Yang, K., Chen, J., Wang, G., and Liu, S. 1998. [study on the antagonistic action of selenite on fluoride-induced lipid peroxidation and on the changes of trace elements in rats]. *Wei Sheng Yen Chiu* 27(3): 201-4.
- No COC** Yang, K., Hammond, G. L., and Challis, J. R. 1992. characterization of an ovine glucocorticoid receptor cDNA and developmental changes in its mRNA levels in the fetal sheep hypothalamus, pituitary gland and adrenal. *Journal of Molecular Endocrinology* 8(2): 173-80.
- In Vit** Yang, M. and Kurkinen, M. 1998. cloning and characterization of a novel matrix metalloproteinase (mmp), cmmp, from chicken embryo fibroblasts. cmmp, xenopus xmmp, and human mmp19 have a conserved unique cysteine in the catalytic domain. *Journal of Biological Chemistry* 273(28): 17893-900.
- In Vit** Yang, Qian and Depierre, Joseph W. rapid one-step isolation of mouse liver catalase by immobilized metal ion affinity chromatography. *Protein Expression Purif.* (1998) 12(2): 277-283.
- FL** Yang, Sen, Dai, Jianguo, and Chen, Jingheng. influence of zinc in the synthesis of hepatic metallothionein in mice. *Yingyang Xuebao* (1995) 17(3): 298-301.
- FL** Yang Shengkui, Cheng Yiyong, Wand Donglan, Li Xiaoyan, and Lin Chunzhu. 1994. a comparative study on the bioavailability of zinc lactate and zinc gluconate in rats. *Acta Nutrimenta Sinica* 16(1): 51-55.
- Gene** Yang, Y., Jeanpierre, C., Dressler, G. R., Lacoste, M., Niaudet, P., and Gubler, M. C. 1999. wt1 and pax-2 podocyte expression in denys-drash syndrome and isolated diffuse mesangial sclerosis. *American Journal of Pathology* 154(1): 181-92.
- Phys** Yang, Yili, Tandon, Pushpa, Liu, Zhao, Sarkisian, Matthew R., Stafstrom, Carl E., and Holmes, Gregory L. synaptic reorganization following kainic acid-induced seizures during development. *Dev. Brain Res.* (1998) 107(2): 169-177 CODEN: DBRRDB; ISSN: 0165-3806.

- FL** Yang, Yuexin, Liu, Jianyu, and Cui, Hongmei. effect of zinc on cadmium-induced fetal damage. *Weisheng Yanjiu* (1998) 27(2): 112-115.
- Acu** Yang, Yuexin, Liu, Jianyu, and Cui, Hongmei. evaluation study of zinc absorption speed and bioavailability by four zinc compounds. *Yingyang Xuebao* (1998) 20(2): 157-162.
- FL** Yang Yuexin Liu Jianyu, Chen Xiaoshu, Wang Jinqi, and Xue Xiaoping. 1995. an investigation on the transmission of zinc from mother to fetus during pregnancy. *Acta Nutrimenta Sinica* 17(3): 293-297.
- FL** Yang Zijun, Cheng Xiangchao (Yuxi Agricultural Training School, Henan China, Wang Zhe, and Li Yuyi. 1992. [acute toxicity effect of high zinc dietary to chickens]. *Henan Agricultural Sciences*. (No. 5) P. 31-32
- FL** Yang Zijun, Wang Zhe, and Li Yuyi (Veterinary Coll. of PLA, Changchun China Teaching and Research Section of Internal Medicine. 1992. effects of dietary calcium and zinc on metallothioneine concentration in liver and kidneys of layer chickens. *Bulletin of Veterinary College of PLA*. V. 12(3) P. 221-226
- Nut** Yano, H., Hirabayashi, M., and Matsui, T. removal of phytate from soybean improves zinc and iron availability in rats. *Biomed. Res. Trace Elem.* (1996) 7(3): 105-106.
- CP** Yano, Y. 1976. *Development of Positron Emitting Radionuclides for Imaging With Improved Positron Detectors*. CONF-761060-7; IAEA-SM-210/123
- FL** Yao Junhu, Cao Binyun, and Dou Cheng (Northwestern Agricultural Univ., Yangling Shaanxi China Dept. of Animal Science. 1996. effects of zinc on the performance of growing heifers. *Acta Universitatis Agriculturae Boreali-Occidentalis*. V. 24(4) P. 55-58
- Unrel** Yao, X., Perez-Alvarado, G. C., Louis, H. A., Pomies, P., Hatt, C., Summers, M. F., and Beckerle, M. C. 1999. solution structure of the chicken cysteine-rich protein, crp1, a double-lim protein implicated in muscle differentiation. *Biochemistry* 38(18): 5701-13.
- Nut def** Yarom, R., Maunder, C., Scripps, M., Hall, T. A., and Dubowitz, V. 1975. a simplified method of specimen preparation for x-ray microanalysis of muscle and blood cells. *Histochemistry* 45(1): 49-59.
- CP** Yarom, R., Peters, P. D., and Hall, T. A. 1975. microanalysis of zinc in injured myocardia. *Proc. Annu. Conf. - Microbeam Anal. Soc.* 10: 46A-46C .
- Effl** Yasmin, S. and Hasnain, S. 1991. cobalt-resistant pseudomonads from industrial effluent. *Punjab University Journal of Zoology* 6(0): 43-48.
- Abstract** YASUDA, M., NAKAMURA, H., SHIBASAKI, F., HIRAOKA, Y., and OKUDA, H. comparison of teratogenicity of cadmium and zinc in the mouse and the medaka fish. *TERATOLOGY* 22(1):12A,1980
- Carcin** Yasuda, Shinichi, Shimada, Koichiro, and Horie, Shohei. 1988 . antitumor effects of cis-diamminedichloroplatinum(ii) against transplantable lung cancer cells of the rat. *Dokkyo Igakkai Zasshi* 4(1): 15-21 .
- Nut def** Yasui, M., Ohta, K., and Sasajima, K. 1994. neutron activation analysis in the central nervous system tissues and bones of rats maintained on minerally unbalanced diets. *Kyoto Daigaku Genshiro Jikkensho Tech. Rep.* KURRI-TR-393, 233-9.

- Mix** Yasui, M., Ota, K., and Oshima, A. 1996. effects of bifemelane hydrochloride on atherosclerosis in aged rats fed low-calcium diets. *Journal of International Medical Research* 24(6): 454-65.
- Mineral** Yasui, M., Yase, Y., Shimizu, E., and Ota, K. resemblance of magnesium and zinc distribution in soft tissues and bone of rats fed unbalanced mineral diets in-situ. *Brain and NERVE (Tokyo)*. 42 (7). 1990. 635-642.
- Bio Acc** Yasui, Masayuki and Ota, Kiichiro. effects of ageing on serum zinc levels in rats fed low calcium-magnesium plus aluminum diets. *Biomed. Res. Trace Elem.* (1994) 5(1): 41-6 .
- FL** Yasui, Masayuki and Ota, Kiichiro. effects of high aluminum diets on calcium and magnesium concentrations in serum, spinal cord and bones of rats fed a low calcium-magnesium diet. *Maguneshumu (Kyoto)* (1998) Volume Date 1997, 16(2): 107-116 .
- Drug** Yasui, Masayuki and Ota, Kiichiro. effects of vitamin k2 on the calcium contents of bones and soft tissues of rats maintained on low calcium/magnesium diets. *Biomed. Res. Trace Elem.* (1999) 10(2): 120-124.
- Nut def** Yasui, Masayuki, Ota, Kiichiro, and Garruto, Ralph M. aluminum decreases the zinc concentration of soft tissues and bones of rats fed a low calcium-magnesium diet. *Biol. Trace Elem. Res.* (1991) 31(3): 293-304.
- No COC** Yasui, Masayuki, Ota, Kiichiro, and Yoshida, Munehito. effects of low calcium and magnesium dietary intake on the central nervous system tissues of rats and calcium-magnesium related disorders in the amyotrophic lateral sclerosis focus in the kii peninsula of japan. *Magnesium Res.* (1997) 10(1): 39-50 .
- No COC** Yasui, Masayuki, Yano, Ichiro, Ota, Kiichiro, Maeda, Jiro, and Oshima, Akira. effects of 3-isobutyl-2-isopropylpyrazolo[1,5-a]pyridine (ibudilast) on calcium deposition in soft tissues of rabbits with atherosclerosis. *Domyaku Koka* (1991) 19(2/3): 181-8.
- Mineral** Yasui, Masayuki, Yase, Yoshiro, Shimizu, Eiji, and Ota, Kiichiro. magnesium and zinc distribution in soft tissues and bone of rats fed diets imbalanced in mineral elements. *Brain Nerve* (1990) 42(7): 635-42.
- Nut** Yazdani, Malektaj, Fontenot, Francine, Gottschalk, Sheila B., Kanemaru, Yoshifumi, Joseph, Fred Jr., and Nakamoto, Tetsuo. relationship of prenatal caffeine exposure and zinc supplementation on fetal rat brain growth. *Dev. Pharmacol. Ther.* (1992) 18(1-2): 108-15.
- Drug** Yazdani, Malektaj, Joseph, Fred Jr., Grant, Sandra, Hartman, Arthur D., and Nakamoto, Tetsuo. various levels of maternal caffeine ingestion during gestation affects biochemical parameters of fetal rat brain differently. *Dev. Pharmacol. Ther.* (1990) Volume Date 1989, 14(1): 52-61.
- No Oral** Yazdanpanah, H., Roshanzamir, F., Shafaghi, B., Faizi, M., Elhami, M., and Rasekh, H. R. 1997. assessment of possible protective roles of selenium, zinc, and cis-stilbene oxide against acute t-2 toxin poisoning: a preliminary report. *Natural Toxins* 5(4): 133-5.
- No Oral** Yazdanpanah, Hassan, Roshanzamir, Farshad, Shafaghi, Bijan, Faizi, Mehrdad , Elhami, Mehrdad, and Rasekh, Hamid R. assessment of possible protective roles of selenium, zinc, and cis-stilbene oxide against acute t-2 toxin poisoning: a preliminary report. *Nat. Toxins* (1997) 5(4): 133-135.
- Unrel** Ye, B. H., Cattoretti, G., Shen, Q., Zhang, J., Hawe, N., de Waard, R., Leung, C., Nouri-Shirazi, M., Orazi, A., Chaganti, R. S., Rothman, P., Stall, A. M., Pandolfi, P. P., and Dalla-Favera, R. 1997. the bcl-6 proto-oncogene controls germinal-centre formation and th2-type inflammation.

Nature Genetics 16(2): 161-70.

- Nut def** Yeh, L. C. and Cerklewski, F. L. 1984. interaction between ethanol and low dietary zinc during gestation and lactation in the rat. *Journal of Nutrition* 114(11): 2027-33.
- Nut def** Yeh, Lee Chuan C. and Cerklewski, Florian L. interaction between ethanol and low dietary zinc during gestation and lactation in the rat. *J. Nutr.* (1984) 114(11): 2027-33.
- Unrel** Yeh, Lee Chuan C., Cerklewski, Florian L., and Soeldner, Alfred. effect of maternal ethanol ingestion at two dietary levels of zinc on molar composition and dental caries of rat offspring. *Nutr. Res. (N. Y.)* (1985) 5(9): 951-7.
- Diss** Yeh, Lee Chuan Caroline. 1984. perinatal and postweaning effects of the interaction between maternal ethanol ingestion and low dietary zinc in the rat. *Avail.: Univ. Microfilms Int. Order No. DA8411475 From: Diss. Abstr. Int. B* 1984, 45. 2. 517. 128 pp.
- Abstract** Yeoman, R. R. and Curry, J. J. mating behavior and copulation induced ovulation after ablation of specific olfactory structures in the cycling rat. *Federation Proceedings*. 35 (3). 1976 727
- Nut** Yi, Z., Kornegay, E. T., and Denbow, D. M. 1996. supplemental microbial phytase improves zinc utilization in broilers. *Poult. Sci.* 75(4): 540-6.
- Phys** Yiagou, M. and Hadjipetrou-Kourounakis, L. 1983. effect of diet on adjuvant induced disease and mitogenic responses of fischer rats. *International Archives of Allergy and Applied Immunology*. 71(4): 374-376.
- Unrel** Yin Hong Z and Weiss John H(A). 1995. zn-2+ permeates ca-2+ permeable ampa/kainate channels and triggers selective neural injury. *Neuroreport* 6(18): 2553-2556.
- FL** Yin Jiti, Shan Anshan, and Liu Dashen (Northeast Agricultural Coll., Harbin China. 1991. effects of dietary fibres on zinc assimilation in broiler chicks. *Heilongjiang Journal of Animal Science and Veterinary Medicine*. (No. 12) P. 8-10
- Nut def** Yin, Shian, Sato, Ikuo, Hosokawa, Yu, Niizeki, Shiro, Tojo, Hitomi, and Yamaguchi, Kenji. effects of dietary zinc and cadmium on tissue selenium concentration and glutathione peroxidase activity in rats fed dl-selenomethionine or sodium selenite. *J. Nutr. Sci. Vitaminol.* (1991) 37(1): 29-37.
- HHE** Yip, R., Reeves, J. D., Lonnerdal, B., Keen, C. L., and Dallman, P. R. 1985. does iron supplementation compromise zinc nutrition in healthy infants. *American Journal Of Clinical Nutrition* 42(4): 683-687.
- CP** Yokoi, K. and Kimura, M. 1995. effect of low rubidium diet on tissue mineral levels in rats. *FASEB Journal* 9(3): A448.
- No COC** Yokoi, Katsuhiko, Kimura, Mieko, and Itokawa, Yoshinori. effect of low dietary rubidium on plasma biochemical parameters and mineral levels in rats. *Biol. Trace Elem. Res.* (1996) 51(2): 199-208.
- Unrel** Yokoro Ken, Yanagidani Akifumi, Obata Takuya, Yamamoto Shoso, and Numoto Michitaka(A). 1998. genomic cloning and characterization of the mouse poz/zinc-finger protein zf5. *Biochemical and Biophysical Research Communications* 246(3): 668-674.
- FL** Yokoyama, E., Endo, T., and Nishikawa, S. 1983. [modifying effects of host factors in cadmium toxicity: species, sex, and age differences in mice]. *Sangyo Igaku* 25(4): 262-71 .

- In Vit** Yokoyama, M., Koh, J., and Choi, D. W. 1986. brief exposure to zinc is toxic to cortical-neurons. *Neuroscience Letters* 71(3): 351-355.
- No COC** Yonezawa, Satoshi, Tanaka, Tetsuya, and Miyauchi, Takako. cathepsin e from rat neutrophils: its properties and possible relations to cathepsin d-like and cathepsin e-like acid proteinases. *Arch. Biochem. Biophys.* (1987) 256(2): 499-508 .
- Drug** Yoshida, A., Araki, T., Ito, S., Furuichi, H., Yoneta, T., Ozeki, M., Kurimoto, T., and Tagashira, E. general pharmacology of catenar-s-mu-n-alpha-3-aminopropionylhistidinato-2-n-1 n-2 o n-tau-zinc z-103 3. effects of z-103 on digestive system urinary excretion renal function reproductive system blood and other function. *Pharmacometrics.* 42 (1). 1991. 83-96.
- Phys** Yoshida, A., Araki, T., Omata, T., Yamaguchi, I., Matsuda, K., Kurimoto, T., and Tagashira, E. 1991. [basal studies on the model of circular excisional wounds made on the dorsal skin of rats treated with hydrocortisone]. *Nippon Yakurigaku Zasshi* 98(5): 369-77.
- In Vit** Yoshida, A., Kaplan, B. E., and Kimura, M. metal binding and de toxification effect of synthetic oligo peptides containing 3 cysteinyl residues. *Proceedings of the National Academy of Sciences of the United States of America.* 76 (1). 1979. 486-490.
- In Vit** Yoshida, Akira, Kaplan, Bruce E., and Kimura, Masami. metal-binding and detoxification effect of synthetic oligopeptides containing three cysteinyl residues. *Proc. Natl. Acad. Sci. U. S. A.* (1979) 76(1): 486-90 .
- FL** Yoshida, M., Hoshii, H., Yonezawa, S., Nakamura, H., Yamaoka, R., and Yoshimura, H. 1976. residue of dietary bacitracin in the liver and kidney of growingchicks. *Japanese Poultry Science* 13(3): 108-109.
- No Oral** YOSHIDA, M., SATOH, H., KOJIMA, S., and YAMAMURA, Y. metallothionein concentrations and organ retention of mercury in the liver and kidney of the neonatal guinea pig after exposure to mercury vapor. *TOHOKU J EXP MED*; 164 (1). 1991. 13-22.
- In Vit** Yoshida, Minoru, Fukumoto, Masakatsu, Kishimoto, Tsuyoshi, Yamamura, Yukio, Shimizu, Hidesuke, and Sakai, Osamu . effects of zinc, selenium, and calcium on the nephrotoxicity of cadmium in primary cultures of rat renal proximal epithelial cells. *Biol. Trace Elem. Res.* (1993) 36(3): 219-27.
- Nut def** Yoshida, S. 1989. [study on the deficiency of trace element induced by aging. 2. effects of zinc deficiency on rats oral mucosa]. *Nippon Hotetsu Shika Gakkai Zasshi* 33(2): 376-90.
- Bact** Yoshida, Tsutomu, Shinoda, Shoko, Kawaai, Yoshie, Iwabuchi, Akira, and Mutai, Masahiko. the effect of gut flora on the utilization of calcium, phosphorus, and zinc in rats fed a diet containing phytate. *Agric. Biol. Chem.* (1985) 49(7): 2199-202.
- No COC** Yoshida, Yasuhisa, Kono, Koichi, Watanabe, Misuzu, Watanabe, Hirokatsu, Inoue, Sumie, Tanioka, Yutaka, Dote, Tomotarou, Orita, Yukio, Umebayashi, Kazuyo, and Nagaie, Hidehiro. metal shift in rats exposed to fluoride. *Environ. Sci. (Tokyo)* (1991) 1(1): 1-9 .
- No COC** YOSHIKAWA, T., TAKEMURA, T., SETO, O., TANIGAWA, T., TAINAKA, K., MORITA, Y., YOSHIDA, N., SUGINO, S., and KONDO, M. role of lipid peroxidation and polymorphonuclear leukocyte-derived oxygen radicals in acute gastric lesions induced by hyperthermic treatment. *JPN J GASTROENTEROL*; 86 (2). 1989. 159-164.
- Drug** Yoshikawa, Takuma. experimental study on drug-induced taste disorders in rats. *Nihon Univ. J. Med.* (1997) 39(6): 353-367.

- In Vit** Yoshinaga, T. 1974. evidence of similar behavior of zinc in intestinal crypts and pancreatic islets. *Endokrinologie* 63(1): 53-65 .
- No Oral** Yoshinaga, T. 1974. evidence of similar behaviour of zinc in intestinal crypts and pancreatic islets. *Endokrinologie* 63(1): 53-65.
- Gene** Youmans, A. S. and Youmans, G. P. 1968. ribonucleic acid, deoxyribonucleic acid, and protein content of cells of different ages of mycobacterium tuberculosis and the relationship to immunogenicity. *Journal of Bacteriology* 95(2): 272-9.
- Phys** Youn, J., Borghesi, L. A., Olson, E. A., and Lynes, M. A. 1995. immunomodulatory activities of extracellular metallothionein. ii. effects on macrophage functions. *Journal of Toxicology and Environmental Health* 45(4): 397-413.
- Unrel** Young, M., Blanchard, M. H., Sessions, F., and Boyle, M. D. 1988. subunit structure of high molecular weight mouse nerve growth factor. *Biochemistry* 27(18): 6675-81.
- Unrel** Young, M. and Koroly, M. J. 1980. nerve growth factor zymogen. stoichiometry of the active-site serine and role of zinc(ii) in controlling autocatalytic self-activation. *Biochemistry* 19(23): 5316-21.
- No Oral** Young, Michael, Blanchard, Muriel H., Sessions, Freida, and Boyle, Michael D. P. subunit structure of high molecular weight mouse nerve growth factor. *Biochemistry (1988)* 27(18): 6675-81.
- Phys** Young, Michael and Koroly, Mary Jo. the nerve growth factor zymogen. stoichiometry of the active-site serine and role of zinc(ii) in controlling autocatalytic self-activation. *Biochemistry (1980)* 19(23): 5316-21 .
- In Vit** Young, R. J., Bodt, B. A., and Heitkamp, D. H. action of metallic ions on the precocious development by rabbit sperm of motion patterns that are characteristic of hyperactivated motility. *Mol. Reprod. Dev. (1995)* 41(2): 239-48 .
- No Dose** Yousif, M. A., El-Attar, H. M., Mahmoud, A. R. M., and El-Magawry, S. 1986. clinical and subclinical rickets in goats in relation to some blood parameters. *Assiut Veterinary Medical Journal* 17(33): 87, 89-94.
- Org Met** Youssef, Hamada M. and El-Wakil, Hamdy B. rodent control: attractive poison bait based on soft body of eobania vermiculata (muller) snails and zinc phosphide. *Alexandria Sci. Exch. (1998)* 19(2): 217-225 CODEN: ALSEEF; ISSN: 1010-1098.
- In Vit** Yu Chengsi and Crutcher Keith A(A). 1995. nerve growth factor immunoreactivity and sympathetic sprouting in the rat hippocampal formation. *Brain Research* 672(1-2): 55-67.
- Unrel** Yu, R. N., Ito, M., Saunders, T. L., Camper, S. A., and Jameson, J. L. 1998. role of ahch in gonadal development and gametogenesis [see comments]. *Nature Genetics* 20(4): 353-7.
- Phys** Yu, S., Berg, G. J. van den., and Beynen, A. C. 1995. copper metabolism in analbuminaemic rats fed a high-copper diet. *Comparative Biochemistry And Physiology. Part A, Physiology.* 110A(3): 259-266.
- FL** Yu, S. and Beynen, A. C(A). 1994. high zinc intake reduces biliary copper excretion in rats. *Journal of Animal Physiology and Animal Nutrition* 72(4-5): 169-175.
- OAC** Yu, S. X., Masters, D. G., Purser, D. B., Wang, Z. S., Yang, R. Z., Liu, N., Lu, D. X., Wu, L. H.,

- Ren, J. K., and Li, G. H. 1995. a description of the trace element status of sheep in three areas of northern china. *ACIAR Technical Reports Series* (32): 35-39.
- Mix** Yu, Shiguang and Beynen, Anton C. the combined effect of high iron and zinc intake on copper status in rats. *Biol. Trace Elem. Res.* (1994) 42(1): 71-9 .
- Diss** Yu, Shiguang 1957. copper metabolism and its interactions with dietary iron, zinc, tin and selenium in rats / shiguang yu. 169 p. : ill. ; 24 cm.
- Nut** Yu, Shouyang, Zhou, Shaobe, Bao, Chunyi, and Gou, Xiaolin. effect of different intake levels of protein and zinc on zinc absorption and retention in rats. *Yingyang Xuebao* (1992) 14(2): 115-19 .
- Unrel** Yuan Hui, Yi Housheng, and Wan Gujun (Hunan Agricultural Coll., Changsha China Dept. of Animal Science and Fisheries . 1991. effect of supplemental different levels of zn, se, cu in cow diet on milk yield, milk quality and relative serum enzyme. *Journal of Hunan Agricultural College*. V. 17(4) P. 725-729
- No Dose** Yuan Limin, Cong Ning, and Lu Xiaolong (Jiangsu Agricultural Coll., Yangzhou China Dept. of Animal Husbandry and Veterinary Medicine. 1993. preliminary research of the changes of chicken egg shell in fine structure and four kinds of element content during incubation. *Journal of Jiangsu Agricultural College*. V. 14(1) P. 61-64
- No COC** Yue Sheng, Zhong Weiqing, Zhang Baolin, Zhu Lingyan, and Tang Wenxia(A). 1996. reaction of metallothionein with ethylenediamine-n, n,n',n'-tetraacetic acid. *Journal of Inorganic Biochemistry* 62(4): 243-251.
- FL** Yue Wenbin Kang Junqing, Guo Dongsheng, Yuan Xiaoying, and Wang Genxiang. 1995. effect of dietary zn level on the performance of the laying hens and zinc content in egg. *Acta Nutrimenta Sinica* 17(3): 308-312.
- FL** Yumii, T. 1981. [a histo-pathological study of the root canal filling method folded simultaneously with a paste root canal filling and the combination in dogs (author's transl)]. *Shika Gakuho* 81(2): 267-307.
- CP** Yun, J. S., Li, Y., Wight, D. C., Portanova, R., Selden, R. F., and Wagner, T. E. the human growth hormone transgene expression in hemizygous and homozygous mice. *Proceedings of the Society for Experimental Biology and Medicine*. 194 (4). 1990. 308-313.
- Nut def** Yun, Shumei, Tang, Yi, and Liu, Shangye. the effect of zinc deficiency on absorption of dietary pteroylpolyglutamate in rats. *Yingyang Xuebao* (1998) 20(4): 398-401 CODEN: YYHPA4; ISSN: 0512-7955.
- Abstract** Yunice, A. A. and Lindeman, R. D. influence of testosterone thyroxine and hydrocortisone on tissue cation concentrations in the rat. *Physiologist*. 20 (4). 1977 105
- No Oral** Yunice, Aniece A. and Lindeman, Robert D. effect of ascorbic acid and zinc sulfate on ethanol toxicity and metabolism. *Proc. Soc. Exp. Biol. Med.* (1977) 154(1): 146-50 .
- No COC** Yuningsih, T. dan. 1985. role of the pesticide carbofuran (furan) in mortality of ducks in java. *Penyakit Hewan* 17(30): 35-40.
- Unrel** Yunoki, M., Kawauchi, M., Ukita, N., Noguchi, Y., Nishio, S., Ono, Y., Asari, S., Ohmoto, T., Asanuma, M., and Ogawa, N. 1997. effects of lecithinized superoxide dismutase on traumatic brain injury in rats. *Journal of Neurotrauma* 14(10): 739-46.

- Nut def** Yuyama, L. K. and Cozzolino, S. M. 1995. [interaction of vitamin a and zinc in lactating rats. experimental deficiency model]. <original> interacao de zinco e vitamina a em ratos na lactacao. modelo de deficiencia experimental. *Archivos Latinoamericanos De Nutricion* 45(4): 305-9.
- Nut** Yuyama, L. K. O. and Cozzolino, S. M. F. 1996. effect of supplementation with peach palm as source of retinol: study with rats. *Revista De Saude Publica* 30(1): 61-66.
- Nut def** Yuyama, L. K. O. and Cozzolino, S. M. F. 1994. zinc bioavailability of a regional diet of manaus, am. study in rats. *Acta Amazonica* 24(3/4): 265-274.
- HHE** Yuyama, Lucia K. O. and Cozzolino, Silvia M. F. bioavailability of zinc in the regional diet of manaus, amazonia. study in rats. *Acta Amazonica* (1996) Volume Date 1994, 24(3/4): 265-273.
- FL** Yuyama, Lucia K. O. and Cozzolino, Silvia M. F. interaction of zinc and vitamin a in rats receiving a regional diet of manaus, Amazonas, Brazil. effect of supplementation with vitamin a, zinc and zinc and vitamin a. *Arch. Latinoam. Nutr.* (1996) 46(3): 216-220 CODEN: ALANBH; ISSN: 0004-0622.
- Nut def** Zablotskaya, K. S. and Paraeva, S. V. production and shell quality of eggs from laying-hens receiving different amounts of zinc in the diet. *Dokl. TSKhA* (1981) : 265, 144-6 CODEN: DTSKAG; ISSN: 0366-984X.
- No COC** Zahran, S. M., Zeweil, H. S., and Ahmed, M. H. Alexandria Univ. Saba Basha Egypt Faculty of Agriculture. 1996. effect of zinc bacitracin inclusion in diets with different dietary fiber levels on growth performance, digestibility, carcass and some blood constituents of growing rabbits. *Alexandria Journal of Agricultural Research*. 41(2): 93-110.
- Nut def** Zaki, I. E., Tadros, S. J., Gayed, M. I., and Marie, N. A. M. effect of a zinc-deficient diet on the esophagus of rats. *J. Egypt. Med. Assoc.* (1982) 65(1-4): 115-22 CODEN: JEMAAJ; ISSN: 0013-2411.
- Nut def** Zaki, I. E., Tadros, S. J., Gayed, M. I., and Marie, N. A. M. 1982. effect of a zinc-deficient diet on the oesophagus of rat. *Journal of the Egyptian Medical Association* 65(1/4): 115-122.
- Nut def** Zalewski, P. D., Jian, X., Soon, L. L., Breed, W. G., Seamark, R. F., Lincoln, S. F., Ward, A. D., and Sun, F. Z. 1996. changes in distribution of labile zinc in mouse spermatozoa during maturation in the epididymis assessed by the fluorophore zinquin. *Reproduction, Fertility, and Development* 8(7): 1097-105.
- Alt** Zalups, Rudolfs K. and Cherian, M. George. renal metallothionein metabolism after a reduction of renal mass. i. effect of unilateral nephrectomy and compensatory renal growth on basal and metal-induced renal metallothionein metabolism. *Toxicology* (1992) 71(1-2): 83-102.
- Unrel** Zambrowicz Brian P, Zimmermann James W, Harendza Christopher J, Simpson Elizabeth M, Page David C, Brinster Ralph L, and Palmiter Richard D(A). 1994. expression of a mouse zfy-1/lacZ transgene in the somatic cells of the embryonic gonad and germ cells of the adult testis. *Development (Cambridge)* 120(6): 1549-1559.
- Nut** Zanini, S. F. and Sazzad, M. H. 1998. effect of addition of microbial phytase and energy levels on growth and nutrient utilization in broiler chicks. *Arquivo Brasileiro De Medicina Veterinaria e Zootecnia* 50(5): 611-618.
- Nut def** Zanini, S. F. and Sazzad, M. H. effects of microbial phytase on growth and mineral utilisation in broilers fed on maize soyabean-based diets. *Br. Poult. Sci.* (1999) 40(3): 348-352.

- Drug** Zannetti, G. and Marchesi, E. 1980. zinc in the treatment of foot rot in sheep. *Clinica Veterinaria* 103(3): 115-127.
- Nut** Zaporowska, H. and Scibior, A. activity of neutrophilic granulocytes in rats following intoxication with vanadium and zinc. *Folia Histochem. Cytobiol.* (1999) 37(2): 113-114.
- Acu** Zareba, G. and Chmielnicka J. 1985. aminolevulinic acid dehydratase activity in the blood of rats exposed to tin and zinc. *Ecotoxicol. Environ. Saf.* 9: 40-46.
- FL** Zaripov, R. Z., Gil'manova, L. F., and Shafigullin, R. I. physiological and biochemical role of coprophagy in the feeding behavior of some rodent species. *PANOV, E. N. (ED.). MATERIALY TRETEI VSESOYUZNOI KONFERENTSII PO POVEDENIYU ZHIVOTNYKH, TOM 1. MEKHANIZMY POVEDENIYA; (PROCEEDINGS OF THE 3RD ALL-UNION CONFERENCE ON ANIMAL BEHAVIOR, VOL. 1. BEHAVIORAL MECHANISMS); 1984. 246P. IZDATEL'STVO NAUKA: MOSCOW, USSR. PAPER. 0 (0). 1983 (Recd. 1984). 187-188.*
- Nut def** Zarling, Edwin J., Mobarhan, Sohrab, and Donahue, Philip E. does zinc deficiency affect intestinal protein content or disaccharidase activity? *J. Lab. Clin. Med.* (1985) 106(6): 708-11.
- No COC** Zarling, Edwin J., Mobarhan, Sohrab, and Donahue, Philip E. effect of moderate prolonged ethanol ingestion on intestinal disaccharidase activity and histology. *J. Lab. Clin. Med.* (1986) 108(1): 7-10.
- No Control** Zarski, T. P., Zarska, H., and Debski, B. 1995. the effect of selenium supplementation in case of salinomycin overdosed broilers. *Annals of Warsaw Agricultural University, Animal Science* (31): 69-73.
- CP** Zaslavsky, B. and Uthus, E. O. 1999. prediction of dietary copper, zinc and iron based on response factors in blood and plasma of rats. *FASEB Journal* 13(4 PART 1): A535.
- In Vit** Zaslavsky, V. 1979. inhibition of vaccinia virus growth by zinc ions effect on early rna and thymidine kinase synthesis. *Journal of Virology.* 29(1): 405-408.
- FL** Zavodsky, G., Klecker, D., and Voda, M. 1992. effects of nutrition on egg shell quality with zinc oxide and calcium carbonate as supplements. *Zivocisna Vyroba* 37(9): 785-792.
- Nut def** Zazzo, J. F., Marx, M., and Claquin, J. 1983. severe zinc-deficiency during continuous enteral nutrition.
- FL** Zdol'nik, T. D., Strova, E. A., and Gorbich, V. F. 1997. [evaluation of digestive function in albino rats exposed to zinc compounds]. <original> otsenka funktsii pishchevareniia u belykh krys pri vozdeistvii soedinenii tsinka. *Gigiena i Sanitariia* (5): 33-6.
- Food** Zdunczyk, Z., Frejnagel, S., and Krefft, B. 1996. effect of faba beans coat with different phenolics content on the use of protein by rats. *Polish Journal of Food and Nutrition Sciences* 5(2): 91-101.
- Surv** Zdziarski, Jacqueline M. Natl Zoological Park Washington DC, Mattix, Mark, Bush, Mitchell, and Montali, Richard J. zinc toxicosis in diving ducks. *J Zoo Wildl Med.* 25(3): 438.
- Org Met** Zea-Iriarte W-L(A), Makiyama, K., Goto, S., Murase, K., Urata, Y., Sekine, I., Hara, K., and Kondo, T. 1996. impairment of antioxidants in colonic epithelial cells isolated from trinitrobenzene sulphonic acid-induced colitis rats. *Scandinavian Journal of Gastroenterology* 31(10): 985-992.

- Phys** Zea-Iriarte Walter-Leopoldo(A), Makiyama Kazuya(A), Goto Shinji, Murase Kunihiko(A), Urata Yoshishige, Sekine Ichiro, Hara Kohei(A), and Kondo Takahito. 1996. significance of impairment of antioxidants in colonic epithelial cells isolated from tnbs-induced colitis rats. *Acta Medica Nagasakiensia* 41(1-2): 35-42.
- Abstract** Zebrowski, E. J., Singh, T. S., Brunka, J. R., Gaschuetz, H. H., and Dowse, C. M. insulin bound zinc affects gingival fibroblast growth and metabolism. 62ND GENERAL SESSION OF THE INTERNATIONAL ASSOCIATION FOR DENTAL RESEARCH AND ANNUAL SESSION OF THE AMERICAN ASSOCIATION FOR DENTAL RESEARCH, DALLAS, TEX., USA, MAR. 15-18, 1984. *J DENT RES.* 63 (Spec. Issue). 1984. 189.
- FL** Zechalko, Alicja, Biernat, Jadwiga, and Szymczak, Jozef. effect of pectin on cumulation of lead and tissue distribution of iron, zinc, magnesium, and copper in rats intoxicated with lead. *Bromatol. Chem. Toksykol.* (1987) 20(3-4): 185-91 CODEN: BCTKAG; ISSN: 0365-9445.
- Bio Acc** Zedda, M. T(A), Bini, P. P., Pau, S., and Sbernardori, U. 1996. constituents of seminal plasma and blood serum of the ram. *Journal of Biological Research (Naples)* 72(7-8): 227-230.
- Diss** Zeid, A. M. M. 1993. effect of some acid mucopolysaccharides on the bio-availability of zinc in rabbits. 93 P.
- Nut** Zelenka, J. 1999. effects of sex and age upon utilization of zinc in chickens. *Czech J. Anim. Sci.* 44(6): 269-272 .
- Gene** Zemanova, K. and Smarda, J. 1998. oncoprotein v-myb and retinoic acid receptor alpha are mutual antagonists. *Blood Cells, Molecules & Diseases* 24(2): 239-50.
- No COC** Zemel, M. and Bidari, M. T. zinc iron and copper availability as affected by ortho phosphates poly phosphates and calcium. *Journal of Food Science.* 48 (2). 1983. 567-569.
- Nut** Zemel, M. B. 1985. metal utilization from casein and soy based diets as affected by tripolyphosphate and hexametaphosphate. *Nutrition Research* 5(8): 879-890.
- In Vit** Zemel, M. B. and Zemel, P. C. 1985. effects of food gums on zinc and iron solubility following invitro digestion. *Journal Of Food Science* 50(2): 547&.
- Unrel** Zeneroli, M. L. 1985. hepatic encephalopathy. experimental studies in a rat model of fulminant hepatic failure. *Journal of Hepatology* 1(3): 301-11.
- Nut def** Zeneroli, M. L. and Baraldi, M. neurotransmission in hepatic encephalopathy. *Adv. Exp. Med. Biol.* (1990) 272(Cirrhosis, Hepatic Encephalopathy, Ammonium Toxic.): 135-48
- In Vit** Zeng Yong-Chun, Bongrani Stefano, Bronzetti Elena, Cadel Sandro, Ricci Alberto, Valsecchi Bruno, and Amenta Francesco(A). 1995. effect of long-term treatment with l-deprenyl on the age-dependent microanatomical changes in the rat hippocampus. *Mechanisms of Ageing and Development* 79(2-3): 169-185.
- FL** Zernov, V. S. 1985. vitamin, enzyme and mineral premixes for finishing pigs. *Zhivotnovodstvo* (4): 55-56.
- FL** Zglobica, A., Jamroz, D., Wezyk, S., and Koloszko, Z. 1990. the use of coccidiostats in rearing pullets and of antibiotics in feeding layers. *Roczniki Naukowe Zootechniki* 17(1-2): 123-135.
- FL** Zglobica, A., Wezyk, S., Jamroz, D., and Kupiec, E. 1990. use of different feed antibiotics in

feeding of broiler chickens. *Roczniki Naukowe Zootechniki* 17(1-2): 113-122.

- Unrel** Zhang, Baolin, He, Dachao, Hou, Cuihong, and Xu, Xiucheng. study on a new type of amino-acid chelated trace fertilizer. *Huaxue Gongye Yu Gongcheng (Tianjin)* (1996) 13(4): 42-46
- Carcin** Zhang, F. L., Fu, H. W., Casey, P. J., and Bishop, W. R. 1996. substitution of cadmium for zinc in farnesyl:protein transferase alters its substrate specificity. *Biochemistry* 35(25): 8166-71.
- Drug** Zhang, G. M., Xu, D. Y., Ji, G. Z., Wu, Q. Y., and Chang, Z. C. 754. studies of the synthesis and experimental therapeutic effects of metal chlorin on 60co-irradiated mice. *Acta Pharm. Sinica (Yao Hsueh Hsueh Pao)* 33 ISS Oct 1998
- Drug** Zhang Guangming, Xu Deyu(A), Ji Guozhen(A), Wu Qiuye, and Chang Zhichu. 1998. studies on the synthesis and experimental therapeutic effects of metal chlorin on 60co-irradiated mice. *Yaoxue Xuebao* 33(10): 748-754.
- FL** Zhang, Guohe, Ye, Gongshao, and Fan, Guang. effect of vitamin d on zinc level of plasma, liver, kidney, testis, prostate, and tibia in rats. *Yingyang Xuebao* (1987) 9(4): 317-22 5.
- FL** Zhang Jianyun (Neimenggu Coll. of Agriculture and Animal Husbandry, Hohhot China Dept. of Animal Science. 1996. the effects of dietary manganese on fertility and hatchability and on the contents of manganese copper and zinc in eggs. *Acta Zoonutrimenta Sinica*. V. 8(1) P. 6-11
- Unrel** Zhang Jue-Rong and Sevanian Alex(A). 1993. the genotoxic effects of arachidonic acid in v79 cells are mediated by peroxidation products. *Toxicology and Applied Pharmacology* 121(2): 193-202.
- FL** Zhang Minhong (Chinese Academy of Agricultural Sciences, Beijing China Inst. of Animal Science. 1991. effects of short-term feeding of zinc oxide-supplemented diet on laying performance and egg zinc content in laying hens. *Acta Zoonutrimenta Sinica*. V. 3(1) P. 48-51
- Gene** Zhang, P. and Mellon, S. H. 1997. multiple orphan nuclear receptors converge to regulate rat p450c17 gene transcription: novel mechanisms for orphan nuclear receptor action. *Molecular Endocrinology* 11(7): 891-904.
- Nut** Zhang Peifang and Allen Jonathan C(A). 1995. a novel dialysis procedure measuring free zn-2+ in bovine milk and plasma. *Journal of Nutrition* 125(7): 1904-1910.
- Diss** Zhang, Peng. prophylactic effect of dietary zinc in a laboratory mouse model of swine dysentery / by peng zhang. i, 65 leaves : ill. ; 28 cm.
- FL** Zhang, S., Cui, K., Cao, S., Li, J., Lu, F., Wu, J., Wu, L., Zhang, J., Yang, X., and Zhang, J. influence of experimental atherosclerosis on serum copper zinc chromium manganese and selenium. *ACTA NUTR SIN.* 11 (4). 1989. 344-349.
- IMM** Zhang, X. H., Wang, L., and Dong, Z. Z. 1991. [effect of zinc on immune function in normal mice]. *[Sheng Li Hsueh Pao]* 43(4): 383-8.
- Mix** Zhang, Xiaoming, Yuan, Xinghua, and Zhang, Kechang. utilization of ca and zn in metal proteinate, metal amino acid complexes and inorganic salts for rats. *Food Health Pac. Rim Int. Conf. Food Sci. Technol.*, 3rd (1999): Meeting Date 1997, 446-451. Editor(s): Whitaker, John R. Publisher: Food & Nutrition Press, Trumbull, Conn..
- Drug** Zhang, Zhenwen, Sun, Zhong, Xu, Gesheng, Wang, Yongming, and Liu, Li. the influence of calcium on prevention and treatment of osteoporosis in ovariectomized rats. *Yingyang Xuebao*

(1996) 18(4): 452-456 CODEN: YYHPA4; ISSN: 0512-7955.

- Nut def** Zhao DeMing, Jiang JinTao, Zhang RiJun, Ma YiXing, He Cheng, and Fang WenJun. 1996. effects of zinc deficiency on the development of the lymphatic organs of broilers. *Chinese Journal of Veterinary Medicine* 22(8): 9-10.
- Nut def** Zhao, L., Eidelsburger, U., Eder, K., and Kirchgessner, M. the effect of masson pine pollen on zinc status and concentrations of serum lipids in growing rats fed zinc deficient diets. *Trace Elem. Electrolytes* (1994) 11(2): 77-83.
- Nut def** Zhao, L., Eiderlsburg, U., Eder, K., and Kirchgessner, M. 1995. [affection of growth of zinc deficiency growing rats]. *Chung-Hua i Hsueh Tsa Chih* 75(4): 230-2, 256.
- Nut** Zhao, L., Windisch, W., and Kirchgessner, M. a study on the nutritive value of pollen from the chinese masson pine (pinus massoniana) and its effect on fecal characteristics in rats. *Z. Ernaehrungswiss.* (1996) 35(4): 341-347.
- Nut def** Zhao, Lin, Eidelsburger, U., Eder, K., and Kirchgessner, M. effect of zinc deficiency on growth and lipid metabolism in rats. *Yingyang Xuebao* (1996) 18(3): 305-312 .
- Nut def** Zhao, Lin, Eiderlsburg, U., Eder, K., and Kirchgessner, M. zinc deficiency effects on growth of rats. *Zhonghua Yixue Zazhi* (1995) 75(4): 230-2 CODEN: CHHTAT; ISSN: 0376-2491.
- FL** Zhao XinHong, Li DeFa, Tian, F., Yang HanChun, and Yang TangBin. 1999. effect of high level of zinc and copper on piglet growth performance, immune response and blood antioxidative enzyme activities in blood. *Journal of China Agricultural University* 4(1): 91-96.
- FL** Zharova, E. P. 1970. age dynamics of the levels of copper, zinc, manganese, and cobalt in the muscles of white russian chickens. *Timiryazev. Sel'Skokhoz. Akad* : No. 157, 247-50 .
- FL** Zhigure, D. R. and Bauman, V. K. inhibiting effect of phosphorus on zinc absorption in the chick intestine. *LATV PSR ZINAT AKAD VESTIS. Latvijas Psr Zinatnu Akademijas Vestis.* (1). 1975 132-133.
- FL** Zhil'kevich, N. M., Ikoiev, F. I., and Khoziev, M. A. 1974. the effect of trace elements and vitamins on reproductive function in first-parity cows. *Zhivotnovodstvo* (3): 74-75.
- FL** Zhil'tsova, L. S., Erokhin, A. S., Seliverstova, I. A., and Larkin, S. N. 1985. freezing bull semen in diluents containing metal complexes. *Doklady Vsesoyuznoi Akademii Sel'Skokhozyaistvennykh Nauk* (1): 33-34.
- Phys** Zhong, C., Tang, N. X., Zheng, C. F., Xu, Y. W., and Wang, T. D. 1991. experimental study on microvascular anastomosis using a dissolvable stent support in the lumen. *Microsurgery* 12(2): 67-71.
- Phys** Zhong, W., Sladek, F. M., and Darnell, J. E. Jr. 1993. the expression pattern of a drosophila homolog to the mouse transcription factor hnf-4 suggests a determinative role in gut formation. *The Embo Journal - European Molecular Biology Organization.* 12(2): 537-544.
- In Vit** Zhou, An, Nielsen, Jens H., Farver, Ole, and Thorn, Niels A. transport of ascorbic acid and dehydroascorbic acid by pancreatic islet cells from neonatal rats. *Biochem. J.* (1991) 274(3): 739-44.
- Nut** Zhou, J. R., Fordyce, E. J., Raboy, V., Dickinson, D. B., Wong, M. S., Burns, R. A., and Erdman, J. W. Jr. reduction of phytic acid in soybean products improves zinc bioavailability in rats. *J.*

Nutr. (1992) 122(12): 2466-73 .

- CP** Zhou, J. R., Wong M-S, Burns, R. A., and Erdman, J. W. Jr. phytic acid reduction in soy protein improves zinc bioavailability. 75TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, ATLANTA, GEORGIA, USA, APRIL 21-25, 1991. FASEB (FED AM SOC EXP BIOL) J. 5 (5). 1991. A938.
- Nut def** Zhou, Jin R., Canar, Michele M., and Erdman, John W. Jr. bone zinc is poorly released in young, growing rats fed marginally zinc-restricted diet. *J. Nutr.* (1993) 123(8): 1383-8.
- Nut def** Zhou, Lili, Fan, Jingguang, Li, Sihan, and Huang, Zuoneng. effects of zinc deficiency and supplement on the levels of serum zinc, copper and lipids in rats. *Yingyang Xuebao* (1995) 17(3): 302-7.
- Nut def** Zhou, Lili, Fan, Jingguang, Li, Sihan, and Huang, Zuoneng. influence of zinc deficiency on serum lipid metabolism and aortic morphology in rats. *Zhongguo Gonggong Weisheng Xuebao* (1995) 14(1): 45-7.
- FL** Zhou, M. 1989. effects of dietary zinc and sulphur amino acid levels on fragility of red blood cells in chickens. *Chinese Journal of Animal Science* 25(1): 7-9.
- FL** Zhou, M. and Zhang, X. G. 1991. study on the interaction between zinc and sulfur amino acids in chicks. *Chinese Journal of Animal Science* 27(6): 3-5, 14.
- FL** Zhou Ming and Ding ChangChun. 1999. effect of zinc deficiency on sulfur amino acid metabolism in chickens. *Chinese Journal of Veterinary Science* 19(2): 181-183.
- Mix** Zhou Ming, Li XiangQiong, and Ding YaoSheng. 1998. effect of iron and zinc levels in diet containing super-dosage copper on blood parameters and productive performance of swine. *Chinese Journal of Veterinary Science* 18(4): 407-409.
- FL** Zhou Ming (Anhui Provincial Coll. of Agriculture, Hefei China Dept. of Animal Science and Veterinary Medicine. 1989. effects of levels of dietary zinc and sulphur-containing amino acid on the fragility of chicken red blood cells. *Chinese Journal of Animal Science*. V. 25(1) P. 7-9
- Nut def** Zhou, Ping and Wu, Jiahui. the effect of zinc deficiency on t cellular immunity in mice. *Yingyang Xuebao* (1995) 17(1): 78-81.
- Bio Acc** Zhou, Shaobo, Wang, Guijie, Qiu, Hongbin, Bao, Chunyi, and Yu, Shanyang. effect of different zinc intake levels on distribution of zinc, iron and copper in rats. *Zhongguo Gonggong Weisheng Xuebao* (1995) 14(5): 302-4 .
- Nut** Zhou, Shaobo, Wang, Guijie, Yu, Shouyang, and Bao, Chunyi. the effect of different protein intake levels on the utilization of protein, zinc, iron, and copper in rats. *Yingyang Xuebao* (1995) 17(2): 135-9 .
- No COC** Zhou, Y., Shao, L., and He, X. comparative study of superoxide dismutase and lactate dehydrogenase isozymes in the tissues from three kinds of murids. *Acta Theriologica Sinica*. 10 (4). 1990. 299-303.
- Phys** Zhu GuoZhang, Lin Ying, Myles, D. G., and Primakoff, P. 1999. identification of four novel adams with potential roles in spermatogenesis and fertilization. *Gene* 234(2): 227-237.
- Gene** Zhu, J., Hill, R. J., Heid, P. J., Fukuyama, M., Sugimoto, A., Priess, J. R., and Rothman, J. H. 1997. end-1 encodes an apparent gata factor that specifies the endoderm precursor in

caenorhabditis elegans embryos. *Genes & Development* 11(21): 2883-96.

- CP** Zhu Xidlian, Jen, K. L. Catherine, and Lee Doh-Yeel. 1993. the role of dietary zinc level in pregnancy-induced insulin resistance in rat. *FASEB Journal* 7(3-4): A734.
- FL** Zhu YuQiu and Wu XiuYun. 1997. principal components analysis of ca, p, vitamin d3, mn and zn levels in diets for broilers. *Chinese Journal of Animal Science* 33(5): 10-15&53.
- Nut def** Zidenber-Cherr, S., Rosenbaum, J., and Keen, C. L. 1988. influence of ethanol consumption on maternal-fetal transfer of zinc in pregnant rats on day 14 of pregnancy. *The Journal Of Nutrition*. 118(7): 865-870.
- Unrel** Zidenberg-Cherr, S., Benak, P. A., Hurley, L. S., and Keen, C. L. 1988. altered mineral metabolism: a mechanism underlying the fetal alcohol syndrome in rats. *Drug-Nutrient Interactions* 5(4): 257-74.
- Abstract** ZIDENBERG-CHERR, S., ROSENBAUM, J., and KEEN, C. L. 1987. reduced placental transfer of zinc during organogenesis a mechanism underlying fetal alcohol syndrome fas in rats. *71ST ANNUAL MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY*
- No COC** Zidenberg-Cherr, Sheri, Rosenbaum, Judith, and Keen, Carl L. influence of ethanol consumption on maternal-fetal transfer of zinc in pregnant rats on day 14 of pregnancy. *J. Nutr.* (1988) 118(7): 865-70
- FL** Zigure, D. and Bauman, V. increased calcium and phosphorus levels in the ration as a reason for the development of secondary zinc deficiency in chicks. *Usvoenie Pishch. Veshchestv v Organizme Zhivotnykh.* (1977) 61-8 From: *Ref. Zh. Biol. Khim.* 1977, Abstr. No. 24Ts852.
- FL** Zigure, D. and Bauman, V. inhibitory effect of phosphorus on zinc absorption in the intestine of chicks. *Latv. PSR Zinat. Akad. Vestis* (1975) (1): 132-3.
- Mineral** Zigure, D., Bauman, V., Valinie, M., and Andrusait, R. 1975. uptake and metabolism of zinc in chickens depending on the level of calcium in the ration. *Vsasyvanie Obmen Pitatel'Nykh Veshchestv Org. Zhivotn.* 38-45. Editor(s): Shmit, A. A. Publisher: "Zinatne", Riga, USSR.
- Phys** Zini, A. and Schlegel, P. N(A). 1997. identification and characterization of antioxidant enzyme mrnas in the rat epididymis. *International Journal of Andrology* 20(2): 86-91.
- In Vit** Zini Armand and Schlegel Peter N(A). 1997. cu/zn superoxide dismutase, catalase and glutathione peroxidase mrna expression in the rat testis after surgical cryptorchidism and efferent duct ligation. *Journal of Urology* 158(2): 659-663.
- CP** Zini Sylvie, Fournie-Zaluski Marie-Claude, Chauvel Eric, Roques Bernardp. , and Llorens-Cortes Pierre Corvol And Catherine(A). 1996. identification of metabolic pathways of brain angiotensin ii and iii using specific aminopeptidase inhibitors; predominant role of angiotensin iii in the control of vasopressin release. *Proceedings of the National Academy of Sciences of the United States of America* 93(21): 11968-11973.
- Nut** Zinn, K. R., Chaudhuri, T. R., Mountz, J. M., Berg, G. J. van den, Gordon, D. T., and Johanning, G. L. 1999. 59fe is retained from an elemental 59fe powder supplement without effects on 65zinc, 47calcium and 67copper in young pigs. *Journal of Nutrition* 129(1): 181-187.
- HHE** Zlotkin, S. H. 1989. nutrient interactions with total parenteral-nutrition - effect of histidine and cysteine intake on urinary zinc excretion. *Journal Of Pediatrics* 114(5): 859-864.

- HHE** Zlotkin, S. H. and Buchanan, B. E. 1988. amino-acid intake and urinary zinc excretion in newborn-infants receiving total parenteral-nutrition . *American Journal Of Clinical Nutrition* 48(2): 330-334.
- CP** Zlotkin, S. H. and Buchanan, B. E. 1983. meeting zinc and copper intake requirements in the parenterally fed preterm and full-term infant. *Journal Of Pediatrics* 103(3): 441-446.
- Fate** Zlotkin, S. H. and Cherian, M. G. 1988. hepatic metallothionein as a source of zinc and cysteine during the 1st year of life. *Pediatric Research* 24(3): 326-329.
- Unrel** Zmener, O. 1984. [root canal filling materials: methodological considerations and choice of an experimental model]. <original> materiales de obturacion para conductos: consideraciones metodologicas y eleccion de un modelo experimental. *Revista De La Asociacion Odontologica Argentina* 72(1): 4-5, 7-10.
- Unrel** Zmener, O. and Dominguez, F. V. 1983. tissue response to a glass ionomer used as an endodontic cement. a preliminary study in dogs. *Oral Surgery, Oral Medicine, and Oral Pathology* 56(2): 198-205.
- Diss** Zmudzki, J. 1986. [lead toxicity in calves [zinc protoporphyrin, aminolevulinic acid dehydratase activity, in vivo diagnosis and laboratory diagnosis]]. <original> toksykologia olowiu u cielat. 89 P.
- Nut** Zolotnitskaya, V. Ya. 1994. stimulating feed supplements in diets for piglets. *Zootekhniya* (12): 14-16.
- Nut def** Zorbas, Yan G., Yaroshenko, Yuri N., Kuznetsov, Nikolai K., and Ivanov, Alexei L. daily zinc supplementation effect on zinc deficiency in rats during prolonged restriction of motor activity. *Biol. Trace Elem. Res. (1997)* 60(1 and 2): 101-113.
- Unrel** Zorick Todd S and Lemke Greg(A). 1996. schwann cell differentiation. *Current Opinion in Cell Biology* 8(6): 870-876.
- Phys** Zou, Wei and Zhao, Yongkui. comparison of seven trace elements in the brains of newborn and adult rats. *Zhongguo Shenjing Kexue Zazhi (1998)* 14(2): 101-104.
- FL** Zou Wie, Feng BoSen, Zhang DongYan, and Yang WenXin. 1999. the effect of supplementing four nutrients on brain development of the offspring rats. *Acta Nutrimenta Sinica* 21(4): 434-439.
- Nut** Zsinka, A. J. N., Peredi, J., Lindner-Szotyori, K., and Biro, G. effect of interesterified dietary fat mixtures on various lipid indexes and liver metal content of rats in fat metabolism disturbance. *Nahrung (1988)* 32(9): 815-21 .
- Drug** Zsinka, A. J. N., Szepvolgyi, J., Foldes, V., Peredi, J., and Lindner-Szotyori, K. study into the effect of diets containing various amounts of soy fiber and fat in rats. *Acta Alimentaria.* 15 (1). 1986. 39-46.
- Bact** Zuckert, Wolfram R., Marquis, Helene, and Goldfine, Howard. modulation of enzymic activity and biological function of listeria monocytogenes broad-range phospholipase c by amino acid substitutions and by replacement with the bacillus cereus ortholog. *Infect. Immun. (1998)* 66(10): 4823-4831.
- CP** Zwick, D., Frimpong, N. A., and Tulp, O. L. effects of zinc intake on oral and i.p. glycemic responses of lain-cp rats. *74TH ANNUAL MEETING OF THE FEDERATION OF AMERICAN*

SOCIETIES FOR EXPERIMENTAL BIOLOGY, PART I, WASHINGTON, D.C., USA, APRIL 1-5, 1990. FASEB (FED AM SOC EXP BIOL) J. 4 (3). 1990. A388.

- Nut def** Zwickl, C. M. and Fraker, P. J. restoration of the antibody mediated response of zinc/caloric deficient neonatal mice. *Immunol. Commun. (1980)* 9(6): 611-26.
- Nut def** Zwickl, C. M. and Fraker, P. J. restoration of the antibody mediated response on zinc caloric deficient neo natal mice. . *Immunological Communications. 9 (6). 1980. 611-626.*
- IMM** Zychlinsky, A., Zheng, L. M., Liu, C. C., and Young, J. D. 1991. cytolytic lymphocytes induce both apoptosis and necrosis in target cells. *Journal of Immunology* 146(1): 393-400.

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Literature Rejection Categories		
Rejection Criteria	Description	Receptor
ABSTRACT (Abstract)	Abstracts of journal publications or conference presentations.	Wildlife Plants and Soil Invertebrates
ACUTE STUDIES (Acu)	Single oral dose or exposure duration of three days or less.	Wildlife
AIR POLLUTION (Air P)	Studies describing the results for air pollution studies.	Wildlife Plants and Soil Invertebrates
ALTERED RECEPTOR (Alt)	Studies that describe the effects of the contaminant on surgically-altered or chemically-modified receptors (e.g., right nephrectomy, left renal artery ligation, hormone implant, etc.).	Wildlife
AQUATIC STUDIES (Aquatic)	Studies that investigate toxicity in aquatic organisms.	Wildlife Plants and Soil Invertebrates
ANATOMICAL STUDIES (Anat)	Studies of anatomy. Instance where the contaminant is used in physical studies (e.g., silver nitrate staining for histology).	Wildlife
BACTERIA (Bact)	Studies on bacteria or susceptibility to bacterial infection.	Wildlife Plants and Soil Invertebrates
BIOACCUMULATION SURVEY (Bio Acc)	Studies reporting the measurement of the concentration of the contaminant in tissues.	Wildlife Plants and Soil Invertebrates
BIOLOGICAL PRODUCT (BioP)	Studies of biological toxicants, including venoms, fungal toxins, <i>Bacillus thuringiensis</i> , other plant, animal, or microbial extracts or toxins.	Wildlife Plants and Soil Invertebrates
BIOMARKER (Biom)	Studies reporting results for a biomarker having no reported association with an adverse effect and an exposure dose (or concentration).	Wildlife
CARCINOGENICITY STUDIES (Carcin)	Studies that report data only for carcinogenic endpoints such as tumor induction. Papers that report systemic toxicity data are retained for coding of appropriate endpoints.	Wildlife Plants and Soil Invertebrates
CHEMICAL METHODS (Chem Meth)	Studies reporting methods for determination of contaminants, purification of chemicals, etc. Studies describing the preparation and analysis of the contaminant in the tissues of the receptor.	Wildlife Plants and Soil Invertebrates
CONFERENCE PROCEEDINGS (CP)	Studies reported in conference and symposium proceedings.	Wildlife Plants and Soil Invertebrates
DEAD (Dead)	Studies reporting results for dead organisms. Studies reporting field mortalities with necropsy data where it is not possible to establish the dose to the organism.	Wildlife Plants and Soil Invertebrates
DISSERTATIONS (Diss)	Dissertations are excluded. However, dissertations are flagged for possible future use.	Wildlife
DRUG (Drug)	Studies reporting results for testing of drug and therapeutic effects and side-effects. Therapeutic drugs include vitamins and minerals. Studies of some minerals may be included if there is potential for adverse effects.	Wildlife Plants and Soil Invertebrates
DUPLICATE DATA (Dup)	Studies reporting results that are duplicated in a separate publication. The publication with the earlier year is used.	Wildlife Plants and Soil Invertebrates

Literature Rejection Categories		
Rejection Criteria	Description	Receptor
ECOLOGICAL INTERACTIONS (Ecol)	Studies of ecological processes that do not investigate effects of contaminant exposure (e.g., studies of “silver” fox natural history; studies on ferrets identified in iron search).	Wildlife Plants and Soil Invertebrates
EFFLUENT (Effl)	Studies reporting effects of effluent, sewage, or polluted runoff.	Wildlife Plants and Soil Invertebrates
ECOLOGICALLY RELEVANT ENDPOINT (ERE)	Studies reporting a result for endpoints considered as ecologically relevant but is not used for deriving Eco-SSLs (e.g., behavior, mortality).	Plants and Soil Invertebrates
CONTAMINANT FATE/METABOLISM (Fate)	Studies reporting what happens to the contaminant, rather than what happens to the organism. Studies describing the intermediary metabolism of the contaminant (e.g., radioactive tracer studies) without description of adverse effects.	Wildlife Plants and Soil Invertebrates
FOREIGN LANGUAGE (FL)	Studies in languages other than English.	Wildlife Plants and Soil Invertebrates
FOOD STUDIES (Food)	Food science studies conducted to improve production of food for human consumption.	Wildlife
FUNGUS (Fungus)	Studies on fungus.	Wildlife Plants and Soil Invertebrates
GENE (Gene)	Studies of genotoxicity (chromosomal aberrations and mutagenicity).	Wildlife Plants and Soil Invertebrates
HUMAN HEALTH (HHE)	Studies with human subjects.	Wildlife Plants and Soil Invertebrates
IMMUNOLOGY (IMM)	Studies on the effects of contaminants on immunological endpoints.	Wildlife Plants and Soil Invertebrates
INVERTEBRATE (Invert)	Studies that investigate the effects of contaminants on terrestrial invertebrates are excluded.	Wildlife
IN VITRO (In Vit)	<i>In vitro</i> studies, including exposure of cell cultures, excised tissues and/or excised organs.	Wildlife Plants and Soil Invertebrates
LEAD SHOT (Lead shot)	Studies administering lead shot as the exposure form. These studies are labeled separately for possible later retrieval and review.	Wildlife
MEDIA (Media)	Authors must report that the study was conducted using natural or artificial soil. Studies conducted in pore water or any other aqueous phase (e.g., hydroponic solution), filter paper, petri dishes, manure, organic or histosols (e.g., peat muck, humus), are not considered suitable for use in defining soil screening levels.	Plants and Soil Invertebrates
METHODS (Meth)	Studies reporting methods or methods development without usable toxicity test results for specific endpoints.	Wildlife Plants and Soil Invertebrates
MINERAL REQUIREMENTS (Mineral)	Studies examining the minerals required for better production of animals for human consumption, unless there is potential for adverse effects.	Wildlife
MIXTURE (Mix)	Studies that report data for combinations of single toxicants (e.g. cadmium and copper) are excluded. Exposure in a field setting from contaminated natural soils or waste application to soil may be coded as Field Survey.	Wildlife Plants and Soil Invertebrates

Literature Rejection Categories		
Rejection Criteria	Description	Receptor
MODELING (Model)	Studies reporting the use of existing data for modeling, i.e., no new organism toxicity data are reported. Studies which extrapolate effects based on known relationships between parameters and adverse effects.	Wildlife Plants and Soil Invertebrates
NO CONTAMINANT OF CONCERN (No COC)	Studies that do not examine the toxicity of Eco-SSL contaminants of concern.	Wildlife Plants and Soil Invertebrates
NO CONTROL (No Control)	Studies which lack a control or which have a control that is classified as invalid for derivation of TRVs.	Wildlife Plants and Soil Invertebrates
NO DATA (No Data)	Studies for which results are stated in text but no data is provided. Also refers to studies with insufficient data where results are reported for only one organism per exposure concentration or dose (wildlife).	Wildlife Plants and Soil Invertebrates
NO DOSE or CONC (No Dose)	Studies with no usable dose or concentration reported, or an insufficient number of doses/concentrations are used based on Eco-SSL SOPs. These are usually identified after examination of full paper. This includes studies which examine effects after exposure to contaminant ceases. This also includes studies where offspring are exposed in utero and/or lactation by doses to parents and then after weaning to similar concentrations as their parents. Dose cannot be determined.	Wildlife Plants and Soil Invertebrates
NO DURATION (No Dur)	Studies with no exposure duration. These are usually identified after examination of full paper.	Wildlife Plants and Soil Invertebrates
NO EFFECT (No Efect)	Studies with no relevant effect evaluated in a biological test species or data not reported for effect discussed.	Wildlife Plants and Soil Invertebrates
NO ORAL (No Oral)	Studies using non-oral routes of contaminant administration including intraperitoneal injection, other injection, inhalation, and dermal exposures.	Wildlife
NO ORGANISM (No Org) or NO SPECIES	Studies that do not examine or test a viable organism (also see in vitro rejection category).	Wildlife Plants and Soil Invertebrates
NOT AVAILABLE (Not Avail)	Papers that could not be located. Citation from electronic searches may be incorrect or the source is not readily available.	Wildlife Plants and Soil Invertebrates
NOT PRIMARY (Not Prim)	Papers that are not the original compilation and/or publication of the experimental data.	Wildlife Plants and Soil Invertebrates
NO TOXICANT (No Tox)	No toxicant used. Publications often report responses to changes in water or soil chemistry variables, e.g., pH or temperature. Such publications are not included.	Wildlife Plants and Soil Invertebrates
NO TOX DATA (No Tox Data)	Studies where toxicant used but no results reported that had a negative impact (plants and soil invertebrates).	Plants and Soil Invertebrates
NUTRIENT (Nutrient)	Nutrition studies reporting no concentration related negative impact.	Plants and Soil Invertebrates
NUTRIENT DEFICIENCY (Nut def)	Studies of the effects of nutrient deficiencies. Nutritional deficient diet is identified by the author. If reviewer is uncertain then the administrator should be consulted. Effects associated with added nutrients are coded.	Wildlife
NUTRITION (Nut)	Studies examining the best or minimum level of a chemical in the diet for improvement of health or maintenance of animals in captivity.	Wildlife
OTHER AMBIENT CONDITIONS (OAC)	Studies which examine other ambient conditions: pH, salinity, DO, UV, radiation, etc.	Wildlife Plants and Soil Invertebrates

Literature Rejection Categories		
Rejection Criteria	Description	Receptor
OIL (Oil)	Studies which examine the effects of oil and petroleum products.	Wildlife Plants and Soil Invertebrates
OM, pH (OM, pH)	Organic matter content of the test soil must be reported by the authors, but may be presented in one of the following ways; total organic carbon (TOC), particulate organic carbon (POC), organic carbon (OC), coarse particulate organic matter (CPOM), particulate organic matter (POM), ash free dry weight of soil, ash free dry mass of soil, percent organic matter, percent peat, loss on ignition (LOI), organic matter content (OMC). With the exception of studies on non-ionizing substances, the study must report the pH of the soil, and the soil pH should be within the range of \$4 and #8.5. Studies that do not report pH or report pH outside this range are rejected.	Plants and Soil Invertebrates
ORGANIC METAL (Org Met)	Studies which examine the effects of organic metals. This includes tetraethyl lead, triethyl lead, chromium picolinate, phenylarsonic acid, roxarsone, 3-nitro-4-phenylarsonic acid, zinc phosphide, monomethylarsonic acid (MMA), dimethylarsinic acid (DMA), trimethylarsine oxide (TMAO), or arsenobetaine (AsBe) and other organo metallic fungicides. Metal acetates and methionines are not rejected and are evaluated.	Wildlife
LEAD BEHAVIOR OR HIGH DOSE MODELS (Pb Behav)	There are a high number of studies in the literature that expose rats or mice to high concentrations of lead in drinking water (0.1, 1 to 2% solutions) and then observe behavior in offspring, and/or pathology changes in the brain of the exposed dam and/or the progeny. Only a representative subset of these studies were coded. Behavior studies examining complex behavior (learned tasks) were also not coded.	Wildlife
PHYSIOLOGY STUDIES (Phys)	Physiology studies where adverse effects are not associated with exposure to contaminants of concern.	Wildlife
PLANT (Plant)	Studies of terrestrial plants are excluded.	Wildlife
PRIMATE (Prim)	Primate studies are excluded.	Wildlife
PUBL AS (Publ as)	The author states that the information in this report has been published in another source. Data are recorded from only one source. The secondary citation is noted as Publ As.	Wildlife Plants and Soil Invertebrates
QSAR (QSAR)	Derivation of Quantitative Structure-Activity Relationships (QSAR) is a form of modeling. QSAR publications are rejected if raw toxicity data are not reported or if the toxicity data are published elsewhere as original data.	Wildlife Plants and Soil Invertebrates
REGULATIONS (Reg)	Regulations and related publications that are not a primary source of data.	Wildlife Plants and Soil Invertebrates
REVIEW (Rev)	Studies in which the data reported in the article are not primary data from research conducted by the author. The publication is a compilation of data published elsewhere. These publications are reviewed manually to identify other relevant literature.	Wildlife Plants and Soil Invertebrates

Literature Rejection Categories		
Rejection Criteria	Description	Receptor
SEDIMENT CONC (Sed)	Studies in which the only exposure concentration/dose reported is for the level of a toxicant in sediment.	Wildlife Plants and Soil Invertebrates
SCORE (Score)	Papers in which all studies had data evaluation scores at or lower then the acceptable cut-off (#10 of 18) for plants and soil invertebrates).	Plants and Soil Invertebrates
SEDIMENT CONC (Sed)	Studies in which the only exposure concentration/dose reported is for the level of a toxicant in sediment.	Wildlife Plants and Soil Invertebrates
SLUDGE	Studies on the effects of ingestion of soils amended with sewage sludge.	Wildlife Plants and Soil Invertebrates
SOIL CONC (Soil)	Studies in which the only exposure concentration/dose reported is for the level of a toxicant in soil.	Wildlife
SPECIES	Studies in which the species of concern was not a terrestrial invertebrate or plant or mammal or bird.	Plants and Soil Invertebrates Wildlife
STRESSOR (QAC)	Studies examining the interaction of a stressor (e.g., radiation, heat, etc.) and the contaminant, where the effect of the contaminant alone cannot be isolated.	Wildlife Plants and Soil Invertebrates
SURVEY (Surv)	Studies reporting the toxicity of a contaminant in the field over a period of time. Often neither a duration nor an exposure concentration is reported.	Wildlife Plants and Soil Invertebrates
REPTILE OR AMPHIBIAN (Herp)	Studies on reptiles and amphibians. These papers flagged for possible later review.	Wildlife Plants and Soil Invertebrates
UNRELATED (Unrel)	Studies that are unrelated to contaminant exposure and response and/or the receptor groups of interest.	Wildlife
WATER QUALITY STUDY (Wqual)	Studies of water quality.	Wildlife Plants and Soil Invertebrates
YEAST (Yeast)	Studies of yeast.	Wildlife Plants and Soil Invertebrates

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Appendix 5-1

*Avian Toxicity Data Extracted and Reviewed for Wildlife Toxicity
Reference Value (TRV) - Zinc*

June 2007

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Appendix 5.1 Avian Toxicity Data Extracted for Wildlife Toxicity Reference Value (TRV)

Zinc

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Result #	Ref N.	Reference	Chemical Form	MW %	Test Species	Phase #	# of Conc/ Doses	Conc/ Doses	Conc/Dose Units	Wet Weight Reported?	Percent Moisture	Application Frequency	Method of Analyses	Route of Exposure	Exposure Duration	Duration Units	Age	Age Units	Lifestage	Sex	Control Type	Endpoint Number	General Effect Group	Effect Type	Effect Measure	Response Site	Study NOAEL	Study LOAEL	Body Weight Reported?	Body Weight in kg	Ingestion Rate Reported?	Ingestion Rate in kg/day or L/day	NOAEL Dose (mg/kg/day)	LOAEL Dose (mg/kg/day)	Data Source	Dose Route	Test Concentrations	Chemical form	Dose Quantification	Endpoint	Dose Range	Statistical Power	Exposure Duration	Test Conditions	Total
Biochemical																																													
1	6655	Hamilton et al, 1979	Zinc carbonate	100	Japanese quail (<i>Coturnix japonica</i>)	2	2	0/125	mg/kg diet	N	na	ADL	U	FD	14	d	0	d	JV	B	C	3	BIO	CHM	HMGL	BL	125		Y	0.0448	N	0.00771	21.5		10	10	5	10	6	1	4	10	10	7	73
2	6403	Hamilton et al, 1981	Zinc carbonate	100	Japanese quail (<i>Coturnix japonica</i>)	1	3	0/250/500	mg/kg diet	N	na	ADL	U	FD	7	d	1	d	JV	B	C	2	BIO	CHM	HMGL	BL	250	500	Y	0.023	N	0.00499	54.3	109	10	10	5	10	6	1	10	10	10	4	76
3	6133	Jackson et al, 1986	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	2	6	0/55/105/125/159/148	mg/kg bw/d	N	na	ADL	U	FD	140	d	40	w	SM	F	C	6	BIO	CHM	LIPD	LI	55	105	Y	1.67	Y	na	55	105	10	10	5	5	7	1	10	10	10	4	72
4	9261	Gasaway and Buss, 1972	Zinc carbonate	100	Mallard duck (<i>Anas platyrhynchos</i>)	1	4	0/3000/6000/9000/12000	mg/kg diet	N	na	ADL	U	FD	45	d	7	w	JV	B	C	5	BIO	CHM	HMCT	BL	3000	6000	N	1.2	Y	0.0306	76.5	153	10	10	5	10	6	1	10	10	10	4	76
5	93	Berg and Martinson, 1972	Zinc Oxide	100	Chicken (<i>Gallus domesticus</i>)	2	7	0/200/400/800/1200/1600/2000	mg/kg diet	N	na	ADL	U	FD	2	w	1	d	JV	NR	C	2	BIO	CHM	ASHC	BO	800	1200	Y	0.076	N	0.01087	114	172	10	10	5	5	6	1	10	10	10	4	71
6	6368	Southern and Baker, 1983	Zinc carbonate	100	Chicken (<i>Gallus domesticus</i>)	1	3	0/2000/4000	mg/kg diet	N	na	ADL	U	FD	14	d	8	d	JV	M	C	3	BIO	CHM	HMGL	BL	2000	4000	Y	0.301	N	0.02664	177	354	10	10	5	10	6	1	10	10	10	4	76
7	6655	Hamilton et al, 1979	Zinc carbonate	100	Japanese quail (<i>Coturnix japonica</i>)	1	6	0/125/250/500/1000/2000	mg/kg diet	N	na	ADL	U	FD	14	d	0	d	JV	B	C	3	BIO	CHM	HMCT	BL		125	Y	0.0405	N	0.00722		22.3	10	10	5	10	6	1	4	10	10	7	73
8	392	Lefevre et al, 1982	Zinc chloride	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/800	mg/kg diet	N	na	ADL	U	FD	5	w	1	d	JV	NR	C	4	BIO	CHM	HMCT	BL		800	Y	0.253	Y	0.02		63.2	10	10	5	10	7	1	4	10	10	4	71
9	8008	Lu et al, 1990	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/500	mg/kg diet	N	na	ADL	U	FD	4	d	14	d	JV	B	C	3	BIO	ENZ	GENZ	PS		500	Y	1.042	Y	0.137		65.7	10	10	5	5	7	1	4	10	10	4	66
10	6133	Jackson et al, 1986	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	3	5	0/216/163/88/98	mg/kg bw/d	N	na	ADL	U	FD	3	w	40	w	SM	F	C	1	BIO	CHM	LIPD	LI		88	Y	1.62	Y	na		88	10	10	5	5	7	1	4	10	10	4	66
11	5617	Pimentel et al, 1992	Zinc	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/1549.3	mg/kg diet	N	na	ADL	M	FD	3	w	1	d	JV	B	C	3	BIO	CHM	HMGL	WO		1549.3	Y	0.1217	Y	0.0104		132	10	10	10	5	7	1	4	10	10	4	70
12	7245	Sandoval et al, 1998	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	3	2	0/1000	mg/kg diet	N	na	ADL	U	FD	1	w	1	d	JV	F	C	1	BIO	CHM	MCPR	LI		1000	N	0.084	N	0.0116		138	10	10	5	10	5	1	4	10	10	4	69
13	6627	Oh et al, 1979	Zinc acetate	100	Chicken (<i>Gallus domesticus</i>)	2	2	0/4000	mg/kg diet	N	na	ADL	U	FD	4	w	1	d	JV	NR	C	5	BIO	CHM	GBCM	LI		4000	Y	0.714	Y	0.0449		252	10	10	5	5	7	1	4	10	10	4	66
14	2517	Bafundo et al, 1984	Zinc carbonate	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/4000	mg/kg diet	N	na	ADL	U	FD	14	d	8	d	JV	F	C	1	BIO	CHM	HMGL	WO		4000	N	0.564	N	0.04009		284	10	10	5	10	5	1	4	10	10	4	69
15	5681	Dean et al, 1991	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/5280	mg/kg diet	N	na	ADL	M	FD	1	w	1	d	JV	M	C	3	BIO	CHM	GBCM	SR		5280	Y	0.09	Y	0.0129		757	10	10	10	5	7	1	4	10	10	4	71
Behavior																																													
16	5917	Baker and Halpin, 1988	Zinc carbonate	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/318	mg/kg diet	N	na	ADL	M	FD	14	d	8	d	JV	M	C	2	BEH	FDB	FCNS	WO	318		N	0.564	Y	0.0266	15.0		10	10	10	10	6	4	4	1	10	4	69
17	5247	Sandoval et al, 1997	Zinc sulfate	100	Chicken (<i>Gallus domesticus</i>)	1	4	0/400/800/1200	mg/kg diet	N	na	ADL	U	FD	20	d	1	d	JV	B	C	1	BEH	FDB	FCNS	WO	800	1200	N	0.564	Y	0.032	45.4	68.1	10	10	5	10	6	4	10	10	10	4	79
18	6133	Jackson et al, 1986	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	2	6	0/55/105/125/159/148	mg/kg bw/d	N	na	ADL	U	FD	140	d	40	w	SM	F	C	3	BEH	FDB	FCNS	WO	55	105	Y	1.86	Y	na	55	105	10	10	5	5	7	4	10	10	10	4	75
19	6048	Gibson et al, 1986	Zinc acetate	100	Chicken (<i>Gallus domesticus</i>)	2	6	0/114.7/133/162.1/107.4/135.9	mg/d	N	na	ADL	U	FD	10	w	30	w	JV	F	C	2	BEH	FDB	FCNS	WO	114.7	133	Y	2	Y	0.1167	57.3	66.5	10	10	5	5	7	4	10	10	10	4	75
20	6048	Gibson et al, 1986	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	6	0/113.4/218.3/202.3/196.3/216.3	mg/d	N	na	ADL	U	FD	10	w	30	w	JV	F	C	1	BEH	FDB	FCNS	WO	113.4	218.3	Y	1.77	Y	0.1256	64.1	123	10	10	5	5	7	4	10	10	10	4	75
21	37018	Dewar et al, 1983	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	2	4	0/1000/2000/4000	mg/kg diet	N	na	ADL	U	FD	4	w	1	d	JV	B	C	4	BEH	FDB	FCNS	WO	1000	2000	Y	0.669	Y	0.0439	65.6	131	10	10	5	5	7	4	10	10	10	4	75
22	8184	Stevenson et al, 1987	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	2	9	0/0.5/0.75/1.00/1.25/1.5/2.0/3.0/4.0	g/kg diet	N	na	ADL	U	FD	140	d	28	w	JV	F	C	1	BEH	FDB	FCNS	WO	1.5	2	Y	1.9	Y	0.099	78.2	104	10	10	5	5	7	4	10	10	10	4	75
23	6039	Henry et al, 1987	Zinc sulfate	100	Chicken (<i>Gallus domesticus</i>)	1	4	0/500/1000/1500	mg/kg diet	N	na	ADL	U	FD	1	w	1	d	JV	M	C	2	BEH	FDB	FCNS	WO	500	1000	N	0.084	Y	0.0155	92.3	185	10	10	5	10	6	4	10	10	10	4	79
24	8184	Stevenson et al, 1987	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	9	0/0.5/0.75/1.0/1/.25/1.50/2.0/3.0/4.0	g/kg diet	N	na	ADL	U	FD	140	d	28	w	JV	F	C	1	BEH	FDB	FCNS	WO	1.5	2	Y	1.411	Y	0.094	99.9	133	10	10	5	5	7	4	10	10	10	4	75

Appendix 5.1 Avian Toxicity Data Extracted for Wildlife Toxicity Reference Value (TRV)

Zinc

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Result #	Ref N.	Reference	Chemical Form	MW %	Test Species	Phase #	# of Conc/ Doses	Conc/ Doses	Conc/Dose Units	Wet Weight Reported?	Percent Moisture	Application Frequency	Method of Analyses	Route of Exposure	Exposure Duration	Duration Units	Age	Age Units	Lifestage	Sex	Control Type	Endpoint Number	General Effect Group	Effect Type	Effect Measure	Response Site	Study NOAEL	Study LOAEL	Body Weight Reported?	Body Weight in kg	Ingestion Rate Reported?	Ingestion Rate in kg/day or L/day	NOAEL Dose (mg/kg/day)	LOAEL Dose (mg/kg/day)	Data Source	Dose Route	Test Concentrations	Chemical form	Dose Quantification	Endpoint	Dose Range	Statistical Power	Exposure Duration	Test Conditions	Total
54	5373	Bartov, 1996	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	4	0/0.25/0.50/1.0	% in diet	N	na	ADL	U	FD	2	w	1	w	JV	F	C	3	PHY	PHY	FDCV	WO		0.25	Y	0.406	Y	0.0511		315	10	10	5	5	7	4	4	10	10	4	69
55	5373	Bartov, 1996	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	2	4	0/0.65/0.75/0.85	% in diet	N	na	ADL	U	FD	2	w	1	w	JV	F	C	3	PHY	PHY	FDCV	WO		0.65	Y	0.139	Y	0.0293		1370	10	10	5	5	7	4	4	10	10	4	69
Pathology																																													
56	6133	Jackson et al, 1986	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	2	6	0/55/105/125/159/148	mg/kg bw/d	N	na	ADL	U	FD	140	d	40	w	SM	F	C	5	PTH	ORW	ORWT	SP	55	105	Y	1.86	Y	na	55	105	10	10	5	5	7	4	10	10	10	4	75
57	392	Lefevre et al, 1982	Zinc chloride	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/800	mg/kg diet	N	na	ADL	U	FD	5	w	1	d	JV	NR	C	5	PTH	ORW	ORWT	LU	800		Y	0.253	Y	0.02	63.2		10	10	5	10	7	4	4	3	10	4	67
58	6048	Gibson et al, 1986	Zinc acetate	100	Chicken (<i>Gallus domesticus</i>)	2	6	0/114.7/133/162.1/107.4/135.9	mg/d	N	na	ADL	U	FD	10	w	30	w	JV	F	C	5	PTH	ORW	SMIX	LI	133	162.1	Y	1.77	Y	0.0694	75.1	91.6	10	10	5	5	7	4	10	10	10	4	75
59	6048	Gibson et al, 1986	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	6	0/113.4/218.3/202.3/196.3/216.3	mg/d	N	na	ADL	U	FD	10	w	30	w	JV	F	C	4	PTH	ORW	SMIX	LI	202.3	216.3	Y	1.69	Y	0.072	120	128	10	10	5	5	7	4	10	10	10	4	75
60	8184	Stevenson et al, 1987	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	2	9	0/0.5/0.75/1.00/1.25/1.5/2.0/3.0/4.0	g/kg diet	N	na	ADL	U	FD	140	d	28	w	JV	F	C	5	PTH	ORW	SMIX	GZ	3	4	Y	1.726	Y	0.072	125	167	10	10	5	5	7	4	10	10	10	4	75
61	8184	Stevenson et al, 1987	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	9	0/0.5/0.75/1.0/1./25/1.50/2.0/3.0/4.0	g/kg diet	N	na	ADL	U	FD	140	d	28	w	JV	F	C	5	PTH	ORW	SMIX	GZ	2	3	Y	1.333	Y	0.086	129	194	10	10	5	5	7	4	10	10	10	4	75
62	5820	Stahl et al, 1989	Zinc carbonate	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/2183	mg/kg diet	N	na	ADL	U	FD	20	d	1	d	JV	B	C	4	PTH	ORW	SMIX	LI		2183	N	0.564	Y	0.008		31.0	10	10	5	10	6	4	4	10	10	4	73
63	5820	Stahl et al, 1989	Zinc carbonate	100	Chicken (<i>Gallus domesticus</i>)	2	2	0/2171	mg/kg diet	N	na	ADL	U	FD	20	d	1	d	JV	B	C	4	PTH	ORW	SMIX	LI	2171		N	0.564	Y	0.0092		35.4	10	10	5	10	6	4	4	10	10	4	73
64	5903	Lu and Combs, 1988	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/500	mg/kg diet	N	na	ADL	U	FD	8	d	1	d	JV	NR	C	3	PTH	HIS	GHIS	PS		500	N	0.084	Y	0.00701		41.7	10	10	5	5	6	4	4	10	10	4	68
65	37018	Dewar et al, 1983	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	2	4	0/1000/2000/4000	mg/kg diet	N	na	ADL	U	FD	4	w	1	d	JV	B	C	3	PTH	HIS	USTR	GZ		1000	Y	0.669	Y	0.0439		65.6	10	10	5	5	7	4	4	10	10	4	69
66	6133	Jackson et al, 1986	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	3	5	0/216/163/88/98	mg/kg bw/d	N	na	ADL	U	FD	3	w	40	w	SM	F	C	1	PTH	ORW	ORWT	LI		88	Y	1.62	Y	na		88	10	10	5	5	7	4	4	10	10	4	69
67	9261	Gasaway and Buss, 1972	Zinc carbonate	100	Mallard duck (<i>Anas platyrhynchos</i>)	1	4	0/3000/6000/9000/12000	mg/kg diet	N	na	ADL	U	FD	10	d	7	w	JV	B	C	2	PTH	ORW	SMIX	AR		3000	N	1.2	Y	0.0504		126	10	10	5	10	6	4	4	10	10	4	73
68	37018	Dewar et al, 1983	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	4	0/2000/4000/6000	mg/kg diet	N	na	ADL	U	FD	4	w	2	w	JV	B	C	3	PTH	HIS	USTR	GZ		2000	Y	0.551	N	0.03948		143	10	10	5	5	6	4	4	10	10	4	68
69	37018	Dewar et al, 1983	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	3	3	0/10000/20000	mg/kg diet	N	na	ADL	U	FD	4	d	18	mo	AD	F	C	3	PTH	HIS	USTR	GZ		10000	Y	1.6	Y	0.0255		159	10	10	5	5	7	4	4	10	10	4	69
70	5681	Dean et al, 1991	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/5280	mg/kg diet	N	na	ADL	M	FD	4	w	1	d	JV	M	C	4	PTH	HIS	GHIS	TY		5280	Y	0.35	Y	0.0132		199	10	10	10	5	7	4	4	10	10	4	74
71	6133	Jackson et al, 1986	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	5	0/367/480/505/325	mg/kg bw/d	N	na	ADL	U	FD	3	w	40	w	SM	F	C	5	PTH	ORW	ORWT	SP		367	Y	1.34	Y	na		367	10	10	5	5	7	4	4	10	10	4	69
72	80	Van Vleet et al, 1981	Zinc sulfate	100	Duck (<i>Anas platyrhynchos</i>)	2	2	0/3000	mg/kg diet	N	na	ADL	U	FD	15	d	1	d	JV	M	C	1	PTH	HIS	NCRO	PS		3000	N	0.092	N	0.01231		401	10	10	5	10	5	4	4	10	10	4	72
73	80	Van Vleet et al, 1981	Zinc sulfate	100	Duck (<i>Anas platyrhynchos</i>)	1	2	0/6000	mg/kg diet	N	na	ADL	U	FD	15	d	1	d	JV	M	C	1	PTH	HIS	NCRO	PS		6000	N	0.092	N	0.01231		803	10	10	5	10	5	4	4	10	10	4	72
74	7089	Berry and Brake, 1990	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/2	% in diet	N	na	ADL	U	FD	49	d	66	w	LB	F	C	2	PTH	ORW	SMIX	DT		2	N	1.6	N	0.07903		988	10	10	5	5	5	4	4	10	10	4	67
Reproduction																																													
75	48543	Kaya et al, 2001	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	5	0/200	mg/kg diet	N	na	ADL	U	FD	12	w	NR	NR	LB	F	C	2	REP	REP	PROG	WO	200		Y	1.8	Y	0.124	13.8		10	10	5	5	7	10	4	10	10	4	75
76	8798	Schisler and Kienholz, 1967	Zinc carbonate	100	Chicken (<i>Gallus domesticus</i>																																								

Zinc
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Result #	Ref N.	Reference	Chemical Form	MW %	Test Species	Phase #	# of Conc/ Doses	Exposure																Effects				Conversion to mg/kg bw/day		Result		Data Evaluation Score														
								Conc/ Doses	Conc/Dose Units	Wet Weight Reported?	Percent Moisture	Application Frequency	Method of Analyses	Route of Exposure	Exposure Duration	Duration Units	Age	Age Units	Lifestage	Sex	Control Type	Endpoint Number	General Effect Group	Effect Type	Effect Measure	Response Site	Study NOAEL	Study LOAEL	Body Weight Reported?	Body Weight in kg	Ingestion Rate Reported?	Ingestion Rate in kg/day or L/day	NOAEL Dose (mg/kg/day)	LOAEL Dose (mg/kg/day)	Data Source	Dose Route	Test Concentrations	Chemical form	Dose Quantification	Endpoint	Dose Range	Statistical Power	Exposure Duration	Test Conditions	Total	
107	14538	Roberson and Schaible, 1960	Zinc sulfate	100	Chicken (<i>Gallus domesticus</i>)	5	3	0/1000/1500	mg/kg diet	N	na	ADL	U	FD	4	w	1	d	JV	M	C	1	GRO	GRO	BDWT	WO	1000	1500	Y	0.47	N	0.0356	75.7	114	10	10	5	10	6	8	10	10	10	4	8	71
108	92	Hill, 1974	Zinc sulfate	100	Chicken (<i>Gallus domesticus</i>)	1	5	0/200/500/1000/2000	mg/kg diet	N	na	ADL	U	FD	2	w	1	d	JV	B	C	1	GRO	GRO	BDWT	WO	1000	2000	N	0.328	N	0.02817	85.9	172	10	10	5	10	5	8	10	10	10	4	82	
109	6655	Hamilton et al, 1979	Zinc carbonate	100	Japanese quail (<i>Coturnix japonica</i>)	1	6	0/125/250/500/1000/2000	mg/kg diet	N	na	ADL	U	FD	14	d	8	d	JV	B	C	1	GRO	GRO	BDWT	WO	500	1000	Y	0.0436	N	0.00757	86.8	174	10	10	5	10	6	8	10	10	10	7	86	
110	6039	Henry et al, 1987	Zinc sulfate	100	Chicken (<i>Gallus domesticus</i>)	1	4	0/500/1000/1500	mg/kg diet	N	na	ADL	U	FD	1	w	1	d	JV	M	C	1	GRO	GRO	BDWT	WO	500	1000	N	0.084	Y	0.0155	92.3	185	10	10	5	10	6	8	10	10	10	4	83	
111	6048	Gibson et al, 1986	Zinc	100	Chicken (<i>Gallus domesticus</i>)	3	6	0/1/2/3/4/5	g/kg diet	N	na	ADL	U	FD	10	w	30	w	JV	F	C	1	GRO	GRO	BDWT	WO	2	3	Y	1.77	Y	0.0858	96.9	145	10	10	5	5	7	8	10	10	10	4	79	
112	8184	Stevenson et al, 1987	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	2	9	0/0.5/0.75/1.00/1.25/1.5/2.0/3.0/4.0	g/kg diet	N	na	ADL	U	FD	140	d	28	w	JV	F	C	4	GRO	GRO	BDWT	WO	2	3	Y	1.876	Y	0.093	99.1	149	10	10	5	5	7	8	10	10	10	4	79	
113	5067	Sandoval et al, 1999	Zinc chloride	100	Chicken (<i>Gallus domesticus</i>)	3	2	0/1000	mg/kg diet	N	na	ADL	U	FD	7	d	14	d	JV	M	C	1	GRO	GRO	BDWT	WO	1000		N	0.564	Y	0.058	103		10	10	5	10	6	8	4	1	10	4	68	
114	5067	Sandoval et al, 1999	Zinc sulfate	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/1000	mg/kg diet	N	na	ADL	U	FD	7	d	14	d	JV	M	C	2	GRO	GRO	BDWT	WO	1000		N	0.564	Y	0.058	103		10	10	5	10	6	8	4	1	10	4	68	
115	5764	Stahl, et al, 1990	Zinc sulfate	100	Chicken (<i>Gallus domesticus</i>)	1	3	0/200/2000	mg/kg diet	N	na	ADL	U	FD	44	w	24	w	LB	F	C	1	GRO	GRO	BDWT	WO	2000		Y	1.766	Y	0.114	129		10	10	5	10	7	8	4	1	10	4	69	
116	8184	Stevenson et al, 1987	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	9	0/0.5/0.75/1.0/1/1.25/1.50/2.0/3.0/4.0	g/kg diet	N	na	ADL	U	FD	140	d	28	w	LB	F	C	4	GRO	GRO	BDWT	WO	2	3	Y	1.333	Y	0.086	129	194	10	10	5	5	7	8	10	10	10	4	79	
117	2517	Bafundo et al, 1984	Zinc carbonate	100	Chicken (<i>Gallus domesticus</i>)	2	2	0/2000	mg/kg diet	N	na	ADL	U	FD	14	d	8	d	JV	F	C	1	GRO	GRO	BDWT	WO	2000		N	0.564	N	0.04009	142		10	10	5	10	5	8	4	1	10	4	67	
118	37018	Dewar et al, 1983	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	2	4	0/1000/2000/4000	mg/kg diet	N	na	ADL	U	FD	4	w	1	d	JV	B	C	1	GRO	GRO	BDWT	WO	2000	4000	Y	0.615	Y	0.0439	143	286	10	10	5	5	7	8	10	10	10	4	79	
119	14404	Vohra and Kratzer, 1968	Zinc oxide	100	Turkey (<i>Meleagris gallopavo</i>)	1	7	0/1000/2000/4000/5950/8000/10000	mg/kg diet	N	na	ADL	U	FD	21	d	NR	NR	JV	B	C	1	GRO	GRO	BDWT	WO	2000	4000	N	0.5	N	0.03706	148	297	10	10	5	5	5	8	10	10	10	4	77	
120	14538	Roberson and Schaible, 1960	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	2	4	0/1000/2000/3000	mg/kg diet	N	na	ADL	U	FD	4	w	1	d	JV	M	C	1	GRO	GRO	BDWT	WO	2000	3000	Y	0.441	N	0.03415	155	232	10	10	5	10	6	8	10	10	10	4	83	
121	14538	Roberson and Schaible, 1960	Zinc sulfate	100	Chicken (<i>Gallus domesticus</i>)	4	4	0/1000/2000/3000	mg/kg diet	N	na	ADL	U	FD	4	w	1	d	JV	M	C	1	GRO	GRO	BDWT	WO	2000	3000	Y	0.419	N	0.03304	158	237	10	10	5	10	6	8	10	10	10	4	83	
122	6368	Southern and Baker, 1983	Zinc carbonate	100	Chicken (<i>Gallus domesticus</i>)	1	3	0/2000/4000	mg/kg diet	N	na	ADL	U	FD	14	d	8	d	JV	M	C	1	GRO	GRO	BDWT	WO	2000	4000	Y	0.301	N	0.02664	177	354	10	10	5	10	6	8	10	10	10	4	83	
123	6627	Oh et al, 1979	Zinc acetate	100	Chicken (<i>Gallus domesticus</i>)	1	6	0/1000/2000/4000/8000/16000	mg/kg diet	N	na	ADL	U	FD	4	w	1	d	JV	NR	C	2	GRO	GRO	BDWT	WO	4000	8000	Y	0.714	Y	0.0449	252	503	10	10	5	5	7	8	10	10	10	4	79	
124	6133	Jackson et al, 1986	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	5	0/367/480/505/325	mg/kg bw/d	N	na	ADL	U	FD	1	w	40	w	SM	F	C	2	GRO	GRO	BDWT	WO	367	480	Y	1.34	Y	na	367	480	10	10	5	5	7	8	10	10	10	4	79	
125	5903	Lu and Combs, 1988	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	2	2	0/1000	mg/kg diet	N	na	ADL	U	FD	15	d	1	d	JV	NR	C	1	GRO	GRO	BDWT	WO		1000	N	0.328	Y	0.0071		21.6	10	10	5	5	6	8	4	10	10	4	72	
126	5820	Stahl et al, 1989	Zinc carbonate	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/2183	mg/kg diet	N	na	ADL	U	FD	20	d	1	d	JV	B	C	2	GRO	GRO	BDWT	WO		2183	N	0.564	Y	0.008		31.0	10	10	5	10	6	8	4	10	10	4	77	
127	5866	Lu and Combs, 1988	zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	2	2	0/1000	mg/kg diet	N	na	ADL	U	FD	6	d	20	d	JV	NR	C	1	GRO	GRO	BDWT	WO		1000	Y	0.000564	Y	0.022		39.0	10	10	5	5	7	8	4	10	10	4	73	
128	8008	Lu et al, 1990	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/500	mg/kg diet	N	na	ADL	U	FD	7	d	14	d	JV	B	C	2	GRO	GRO	BDWT	WO		500	N	1.042	Y	0.137		65.7	10	10	5	5	6	8	4	10	10	4	72	
129	6133	Jackson et al, 1986	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	3	5	0/216/163/88/98	mg/kg bw/d	N	na	ADL	U	FD	21	d	40	w	SM	F	C	1	GRO	GRO	BDWT	WO		88	Y	1.62	Y	na		88	10	10	5	5	7	8	4	10	10	4	73	
130	9749	Jensen and Maurice, 1980	Zinc sulfate	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/2000	mg/kg diet	N	na	ADL	U	FD	6	w	NR	NR	SM	F	C	1	GRO	GRO	BDWT	WO		2000	Y	1.523	N	0.07654		101	10	10	5	10	6	8	4	10	10	4	77	
131	9261	Gasaway and Buss, 1972	Zinc carbonate	100	Mallard duck (<i>Anas platyrhynchos</i>)	1	4	0/3000/6000/9000/12000	mg/kg diet	N	na	ADL	U	FD	10	d	7	w	JV	B	C	3	GRO	GRO	BDWT	WO		3000	N	1.2	Y	0.0504		126	10	10	5	10	6	8	4	10	10	4	77	
132	5617	Pimentel et al, 1992	Zinc	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/1549.3	mg/kg diet	N	na	ADL	M	FD	3	w	1	d	JV	B	C	1	GRO	GRO	BDWT	WO		1549.3	Y	0.1217	Y	0.0104		132	10	10	10	4	7	8	4	10	10	4	77	
133	37018	Dewar et al, 1983	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	4	0/2000/4000/6000	mg/kg diet	N	na	ADL	U	FD	4	w	2	w	JV	B	C	1	GRO	GRO	BDWT	WO		2000	Y	0.551	N	0.03948		143	10	10	5	5	6	8	4	10	10	4	72	
134	93	Berg and Martinson, 1972	Zinc Oxide	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/2000	mg/kg diet	N	na	ADL	U	FD	2	w	1	d	JV	NR	C	1	GRO	GRO	BDWT	WO		2000	Y	0.109	N	0.01375		252	10	10	5	5	6	8	4	10	10	4	72	
135	6273	Bafundo et al, 1984	Zinc carbonate	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/2000	mg/kg diet	N	na	ADL	U	FD	14	d	8	d	JV	M	C	1	GRO	GRO	BDWT	WO		2000	N	0.244	N	0.0116		190	10	10	5	10	5	8	4	10	10	4	76	
136	2517	Bafundo et al, 1984	Zinc carbonate	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/4000	mg/kg diet	N	na	ADL	U	FD	14	d	8	d	JV	M	C	2	GRO	GRO	BDWT	WO		4000	N	0.564	N	0.04009		284	10	10	5	10	5	8	4	10	10	4	76	
137	5373	Bartov, 1996	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	4	0/0.25/0.50/1.0	% in diet	N	na	ADL	U	FD	2	w	1	w	JV	F	C	1	GRO	GRO	BDWT	WO		0.25	Y	0.406	Y	0.0511		315	10	10	5	5	7	8	4	10	10	4	73	
138	6435	Rama and Planas, 1981	Zinc	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/5000	mg/kg diet	N	na	ADL	U	FD	9	w	1	d	JV	NR	C	1	GRO	GRO	BDWT	WO		5000	N	0.32	N	0.02772		433	10	10	5	4	5	8	4	10	10	4	70	
139	5681	Dean et al, 1991	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/5280	mg/kg diet	N	na	ADL	M	FD	1	w	1	d	JV	M	C	1	GRO	GRO	BDWT	WO		5280	Y	0.09	Y	0.0129		757	10	10	10	5	7	8	4	10	10	4	78	
140	7956	Bartov et al, 1994	Zinc Oxide	100	Chicken (<i>Gallus domesticus</i>)	1	3	0/0.7/0.8	% in diet	N	na	ADL	U	FD	2	w	1	w	JV	F	C	1	GRO	GRO	BDWT	WO		0.7	Y	0.245	Y	0.032		914	10	10	5	5	7	8	4	10	10	4	73	
141	6545	Palafox and Ho-A, 1980	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/20	mg/g diet	N	na	ADL	U	FD	5	d	38	w	JV	F	C	1	GRO	GRO	BDWT	WO		20	N	1.6	N	0.07903		988	10	10	5	5	5	8	4	10	10	4	71	
142	5373	Bartov, 1996	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	2	4	0/0.65/0.75/0.85	% in diet	N	na	ADL																																		

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Result #	Ref N.	Reference	Chemical Form	MW%	Test Species	Phase #	# of Conc/ Doses	Conc/ Doses	Conc/Dose Units	Wet Weight Reported?	Percent Moisture	Application Frequency	Method of Analyses	Route of Exposure	Exposure Duration	Duration Units	Age	Age Units	Lifestage	Sex	Control Type	Endpoint Number	General Effect Group	Effect Type	Effect Measure	Response Site	Study NOAEL	Study LOAEL	Body Weight Reported?	Body Weight in kg	Ingestion Rate Reported?	Ingestion Rate in kg/day or L/day	NOAEL Dose (mg/kg/day)	LOAEL Dose (mg/kg/day)	Data Source	Dose Route	Test Concentrations	Chemical form	Dose Quantification	Endpoint	Dose Range	Statistical Power	Exposure Duration	Test Conditions	Total
162	37018	Dewar et al, 1983	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	3	3	0/10000/20000	mg/kg diet	N na	ADL	U	FD	4	d	18	mo	AD	F	C	1	MOR	MOR	MORT	WO	20000		N	1.6	Y	0.0255	319		10	10	5	5	6	9	4	10	6	4	64	
163	1369	Hill, 1974	Zinc sulfate	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/500	mg/kg diet	N na	ADL	U	FD	3	w	1	d	JV	B	C	2	MOR	MOR	MORT	WO	500		N	0.001042	N	0.00067	320		10	10	5	10	5	9	4	1	10	4	68	
164	37018	Dewar et al, 1983	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	4	0/2000/4000/6000	mg/kg diet	N na	ADL	U	FD	4	w	2	w	JV	B	C	2	MOR	MOR	MORT	WO	4000	6000	Y	0.377	N	0.03084	327	491	10	10	5	5	6	9	10	10	10	4	79	
165	14404	Vohra and Kratzer, 1968	Zinc oxide	100	Turkey (<i>Meleagris gallopavo</i>)	1	7	0/1000/2000/4000/5950/8000/10000	mg/kg diet	N na	ADL	U	FD	21	d	NR	NR	JV	B	C	2	MOR	MOR	MORT	WO	10000		N	0.5	N	0.03706	741		10	10	5	5	5	9	4	10	10	4	72	
166	9261	Gasaway and Buss, 1972	Zinc carbonate	100	Mallard duck (<i>Anas platyrhynchos</i>)	1	4	0/3000/6000/9000/12000	mg/kg diet	N na	ADL	U	FD	30	d	7	w	JV	B	C	2	MOR	MOR	MORT	WO		3000	N	1.2	Y	0.0504		126	10	10	5	10	6	9	4	10	10	4	78	
167	80	Van Vleet et al, 1981	Zinc sulfate	100	Duck (<i>Anas platyrhynchos</i>)	2	2	0/3000	mg/kg diet	N na	ADL	U	FD	15	d	1	d	JV	M	C	2	MOR	MOR	MORT	WO		3000	N	0.092	N	0.01231		401	10	10	5	10	5	9	4	10	10	4	77	
168	80	Van Vleet et al, 1981	Zinc sulfate	100	Duck (<i>Anas platyrhynchos</i>)	1	2	0/6000	mg/kg diet	N na	ADL	U	FD	15	d	1	d	JV	M	C	3	MOR	MOR	MORT	WO		6000	N	0.092	N	0.01231		803	10	10	5	10	5	9	4	10	10	4	77	
Data Not Used to Derive TRV																																													
169	48543	Kaya et al, 2001	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	5	0/200	mg/kg diet	N na	ADL	U	FD	12	w	NR	NR	AD	F	C	3	BEH	FDB	FCNS	WO	200		N	1.8	Y	0.124	13.8		10	10	5	5	6	4	4	10	6	4	64	
170	48543	Kaya et al, 2001	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	5	0/200	mg/kg diet	N na	ADL	U	FD	12	w	NR	NR	AD	F	C	1	PTH	GRS	BDWT	WO	200		Y	1.8	Y	0.124	13.8		10	10	5	5	7	4	4	10	6	4	65	
171	48543	Kaya et al, 2001	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	5	0/200	mg/kg diet	N na	ADL	U	FD	12	w	NR	NR	AD	F	C	4	PHY	PHY	FDCV	WO	200		Y	1.8	Y	0.124	13.8		10	10	5	5	7	4	4	6	6	4	61	
172	5090	Mohanna and Nys, 1999	Zinc sulfate	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/170	mg/kg diet	N na	ADL	U	FD	16	d	5	d	JV	NR	C	3	PHY	PHY	FDCV	WO	170		N	0.580	Y	0.0548	16.1		10	10	5	10	6	4	4	1	10	4	64	
173	5090	Mohanna and Nys, 1999	Zinc sulfate	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/170	mg/kg diet	N na	ADL	U	FD	16	d	5	d	JV	NR	C	2	BEH	FDB	FCNS	WO	170		N	0.58	Y	0.0548	16.1		10	10	5	10	6	4	4	1	10	4	64	
174	5820	Stahl et al, 1989	Zinc carbonate	100	Chicken (<i>Gallus domesticus</i>)	2	2	0/2171	mg/kg diet	N na	ADL	U	FD	20	d	1	d	JV	B	C	3	BEH	FDB	FCNS	WO	2171		N	0.564	Y	0.0092	35.4		10	10	5	10	6	4	4	1	10	4	64	
175	5903	Lu and Combs, 1988	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/500	mg/kg diet	N na	ADL	U	FD	8	d	1	d	JV	NR	C	1	GRO	GRO	BDWT	WO	500		N	0.084	Y	0.00701	41.7		10	10	5	5	6	8	4	1	10	4	63	
176	5903	Lu and Combs, 1988	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/500	mg/kg diet	N na	ADL	U	FD	8	d	1	d	JV	NR	C	2	BEH	FDB	FCNS	WO	500		N	0.084	Y	0.00701	41.7		10	10	5	5	6	4	4	1	10	4	59	
177	14531	Mehring et al, 1956	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	6	0/168/252/371/540/778	mg/kg diet	N na	ADL	U	FD	5	w	4	w	JV	B	C	1	GRO	GRO	BDWT	WO	778		Y	1.1953	N	0.06537	42.5		10	10	5	5	6	8	4	1	10	4	63	
178	14531	Mehring et al, 1956	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	6	0/168/252/371/540/778	mg/kg diet	N na	ADL	U	FD	5	w	4	w	JV	B	C	2	PHY	PHY	FDCV	WO	778		Y	1.1953	N	0.06537	42.5		10	10	5	5	6	4	4	1	3	4	52	
179	5841	Hill, 1989	Zinc sulfate hepathydrate	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/500	mg/kg diet	N na	ADL	U	FD	10	d	1	d	JV	F	C	2	BIO	CHM	HMCT	BL	500		Y	0.328	N	0.02817	42.9		10	10	5	10	6	1	4	1	10	4	61	
180	8008	Lu et al, 1990	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/500	mg/kg diet	N na	ADL	U	FD	7	d	14	d	JV	B	C	1	BEH	FDB	FCNS	WO	500		N	1.042	Y	0.137	65.7		10	10	5	5	6	4	4	1	10	4	59	
181	5067	Sandoval et al, 1999	Zinc chloride	100	Chicken (<i>Gallus domesticus</i>)	3	2	0/1000	mg/kg diet	N na	ADL	U	FD	7	d	14	d	JV	M	C	3	PHY	PHY	FDCV	WO	1000		N	0.564	N	0.04009	71.1		10	10	5	10	5	4	4	1	10	4	63	
182	5067	Sandoval et al, 1999	Zinc chloride	100	Chicken (<i>Gallus domesticus</i>)	3	2	0/1000	mg/kg diet	N na	ADL	U	FD	7	d	14	d	JV	M	C	2	BEH	FDB	FCNS	WO	1000		N	0.564	N	0.04009	71.1		10	10	5	10	5	4	4	1	10	4	63	
183	5247	Sandoval et al, 1997	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	3	4	0/400/800/1200	mg/kg diet	N na	ADL	U	FD	20	d	1	d	JV	B	C	1	BEH	FDB	FCNS	WO	1200		N	0.564	Y	0.0346	73.6		10	10	5	5	6	4	4	1	10	4	59	
184	14538	Roberson and Schaible, 1960	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	10	0/200/300/400/500/600/700/800/900/1000	mg/kg diet	N na	ADL	U	FD	4	w	1	w	JV	M	C	1	GRO	GRO	BDWT	WO	1000		Y	0.473	N	0.03575	75.6		10	10	5	5	6	8	4	1	10	4	63	
185	14538	Roberson and Schaible, 1960	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	10	0/200/300/400/500/600/700/800/900/1000	mg/kg diet	N na	ADL	U	FD	4	w	1	w	JV	M	C	3	PHY	PHY	FDCV	WO	1000		Y	0.473	N	0.03575	75.6		10	10	5	5	6	4	4	1	10	4	59	
186	5247	Sandoval et al, 1997	Zinc carbonate	100	Chicken (<i>Gallus domesticus</i>)	2	4	0/400/800/1200	mg/kg diet	N na	ADL	U	FD	20	d	1	d	JV	B	C	1	BEH	FDB	FCNS	WO	1200		N	0.564	Y	0.0361	76.8		10	10	5	10	6	4	4	1	10	4	64	
187	5247	Sandoval et al, 1997	Zinc metal	100	Chicken (<i>Gallus domesticus</i>)	4	4	0/400/800/1200	mg/kg diet	N na	ADL	U	FD	20	d	1	d	JV	B	C	1	BEH	FDB	FCNS	WO	1200		N	0.564	Y	0.0393	83.6		10	10	5	10	6	4	4	1	10	4	64	
188	5067	Sandoval et al, 1999	Zinc sulfate	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/1000	mg/kg diet	N na	ADL	U	FD	7	d	14	d	JV	M	C	3	PHY	PHY	FDCV	WO	1000		Y	0.564	Y	0.058	103		10	10	5	10	7	4	4	1	10	4	65	
189	5067	Sandoval et al, 1999	Zinc sulfate	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/1000	mg/kg diet	N na	ADL	U	FD	7	d	14	d	JV	M	C	1	BEH	FDB	FCNS	WO	1000		Y	0.564	Y	0.058	103		10	10	5	10	7	4	4	1	10	4	65	
190	7245	Sandoval et al, 1998	Zinc sulfate	100	Chicken (<i>Gallus domesticus</i>)	1	4	0/500/1000/1500	mg/kg diet	N na	ADL	U	FD	3	w	1	d	JV	M	C	2	BEH	FDB	FCNS	WO	1500		Y	0.49	Y	0.0342	105		10	10	5	10	7	4	4	1	10	4	65	
191	5067	Sandoval et al, 1999	Zinc acetate	100	Chicken (<i>Gallus domesticus</i>)	2	2	0/1000	mg/kg diet	N na	ADL	U	FD	7	d	14	d	JV	M	C	1	GRO	GRO	BDWT	WO	1000		N	0.564	Y	0.065	115		10	10	5	5	6	8	4	1	10	4	63	
192	5067	Sandoval et al, 1999	Zinc acetate	100	Chicken (<i>Gallus domesticus</i>)	2	2	0/1000	mg/kg diet	N na	ADL	U	FD	7	d	14	d	JV	M	C	3	PHY	PHY	FDCV	WO	1000		N	0.564	Y	0.065	115		10	10	5	5	6	4	4	1	10	4	59	
193	5067	Sandoval et al, 1999	Zinc acetate	100	Chicken (<i>Gallus domesticus</i>)	2	2	0/1000	mg/kg diet	N na	ADL	U	FD	7	d	14	d	JV	M	C	2	BEH	FDB	FCNS	WO	1000		N	0.564	Y	0.065	115		10	10	5	5	6	4	4	1	10	4	59	
194	5764	Stahl, et al, 1990	Zinc sulfate	100	Chicken (<i>Gallus domesticus</i>)	1	3	0/200/2000	mg/kg diet	N na	ADL	U	FD	69	d	24	w	LB	F	C	2	BEH	FDB	FCNS	WO	2000		Y	1.766	Y	0.114	129		10	10	5	10	7	4	4	1	10	4	65	
195	2517	Bafundo et al, 1984	Zinc carbonate	100	Chicken (<i>Gallus domesticus</i>)	2	2	0/2000	mg/kg diet	N na	ADL	U	FD	14	d	8	d	JV	F	C	2	PHY	PHY	FDCV	WO	2000		N	0.564	N	0.04009	142		10	10	5	10	5	4	4	1	10	4	63	
196	6840	Kincaid, et al, 1976	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	4	0/600/1200/2400	mg/kg diet	N na	ADL	U	FD	4	w	1	d	JV	B	C	1	GRO	GRO	BDWT	WO	2400		Y	0.633	N	0.04322	164		10	10	5	5	6	8	4	1	10	4	63	
197	5681	Dean et al, 1991	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/5280	mg/kg diet	N na	ADL	M	FD	4	w	1	d	JV	M	C	2	BEH	FDB	FCNS	WO	5280		Y	0.35	Y	0.0132	199		10	10	10	5	7	4	4	1	10	4	65	
198	5868	Blalock and Hill, 1988	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	3	0/1000/2000	mg/kg diet	N na	ADL	U	FD	12	d	1	d	JV	F	C	1																								

Appendix 5.1 Avian Toxicity Data Extracted for Wildlife Toxicity Reference Value (TRV)

Zinc

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Ref			Exposure																					Effects					Conversion to mg/kg bw/day			Result		Data Evaluation Score											
Result #	Ref N.	Reference	Chemical Form	MW %	Test Species	Phase #	# of Conc/ Doses	Conc/ Doses	Conc/Dose Units	Wet Weight Reported?	Percent Moisture	Application Frequency	Method of Analyses	Route of Exposure	Exposure Duration	Duration Units	Age	Age Units	Lifestage	Sex	Control Type	Endpoint Number	General Effect Group	Effect Type	Effect Measure	Response Site	Study NOAEL	Study LOAEL	Body Weight Reported?	Body Weight in kg	Ingestion Rate Reported?	Ingestion Rate in kg/day or L/day	NOAEL Dose (mg/kg/day)	LOAEL Dose (mg/kg/day)	Data Source	Dose Route	Test Concentrations	Chemical form	Dose Quantification	Endpoint	Dose Range	Statistical Power	Exposure Duration	Test Conditions	Total
217	5903	Lu and Combs, 1988	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	3	10	0/200/300/400/500/600/800/1000	mg/kg diet	N	na	ADL	U	FD	14	d	1	d	JV	NR	C	1	BIO	ENZ	GENZ	PS		1000	N	0.328	N	0.02817		85.9	10	10	5	5	5	1	4	10	10	4	64
218	5868	Blalock and Hill, 1988	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	3	0/1000/2000	mg/kg diet	N	na	ADL	U	FD	12	d	1	d	JV	F	C	3	BIO	CHM	HMGL	BL		1000	Y	0.164	N	0.01794		109	10	10	5	5	6	1	4	10	10	4	65
219	7245	Sandoval et al, 1998	Zinc acetate	100	Chicken (<i>Gallus domesticus</i>)	2	2	0/1000	mg/kg diet	N	na	ADL	U	FD	1	w	1	d	JV	F	C	1	BIO	CHM	MCPR	LI		1000	N	0.084	N	0.0116		138	10	10	5	5	5	1	4	10	10	4	64
220	93	Berg and Martinson, 1972	Zinc Oxide	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/2000	mg/kg diet	N	na	ADL	U	FD	2	w	1	d	JV	NR	C	2	BIO	CHM	ASHC	BO		2000	Y	0.109	N	0.01375		252	10	10	5	5	6	1	4	10	10	4	65
221	5619	Pimentel et al, 1992	Zinc	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/2052.62	mg/kg diet	N	na	ADL	U	FD	21	d	1	d	JV	B	C	1	BIO	CHM	HMGL	BL		2052.6	N	0.0397	N	0.00712		368	10	10	5	4	5	1	4	10	10	4	63
222	1624	Wight et al, 1986	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/20000	mg/kg diet	N	na	ADL	U	FD	5	d	NR	NR	SM	F	C	2	BIO	ENZ	GLPX	PS		20000	N	1.3	Y	0.0336		517	10	10	5	5	6	1	4	10	10	4	65
223	6435	Rama and Planas, 1981	Zinc	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/5000	mg/kg diet	N	na	ADL	U	FD	2	s	1	d	JV	NR	C	2	BIO	CHM	HMGL	BL		5000	Y	0.075	N	0.01078		719	10	10	5	4	6	1	4	10	10	4	64
224	6144	Berry and Brake, 1985	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/20000	mg/kg diet	N	na	ADL	U	FD	4	d	60	w	AD	F	C	1	GRO	GRO	BDWT	WO		20000	N	1.6	N	0.07903		988	10	10	5	5	5	8	4	10	3	4	64
225	7089	Berry and Brake, 1990	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	1	2	0/2	% in diet	N	na	ADL	U	FD	49	d	66	w	LB	F	C	3	BIO	CHM	GBCM	SG		2	N	1.6	N	0.07903		988	10	10	5	5	5	1	4	10	10	4	64
226	8181	Berry et al., 1987	Zinc oxide	100	Chicken (<i>Gallus domesticus</i>)	2	3	0/20000	mg/kg diet	N	na	ADL	U	FD	4	d	1	yr	AD	F	C	1	BIO	CHM	PCLV	BL		20000	N	1.6	N	0.07903		988	10	10	5	5	5	1	4	10	3	4	57

All abbreviations and definitions used in coding stuides are available from Attachment 4-3 of the Eco-SSL guidance(U.S. EPA 2003).

Duplicate values for NOAELs and LOAELs for the same reference represent results from different experimental designs and are identified by different Phase numbers.



Appendix 6-1

*Mammalian Toxicity Data Extracted and Reviewed for Wildlife
Toxicity Reference Value (TRV) - Zinc*

June 2007

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Appendix 6.1 Mammalian Toxicity Data Extracted for Wildlife Toxicity Reference Value (TRV)

Zinc

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Ref					Exposure																			Effects							Conversion to mg/kg bw/day				Result		Data Evaluation Score										
Result #	Ref N.	Reference	Chemical Form	MW%	Test Species	Phase #	# of Conc/ Doses	Conc/ Doses	Conc/Dose Units	Wet Weight Reported?	Percent Moisture	Application Frequency	Method of Analyses	Route of Exposure	Exposure Duration	Duration Units	Age	Age Units	Lifestage	Sex	Control Type	Test Location	General Effect Group	Effect Type	Effect Measure	Response Site	Study NOAEL	Study LOAEL	Body Weight Reported?	Body Weight in kg	Ingestion Rate Reported?	Ingestion Rate in kg or L/day	NOAEL Dose (mg/kg/day)	LOAEL Dose (mg/kg/day)	Data Source	Dose Route	Test Concentrations	Chemical form	Dose Quantification	Endpoint	Dose Range	Statistical Power	Exposure Duration	Test Conditions	Total		
Biochemical																																															
1	2033	Brandt, 1983	Zinc sulfate	100	Mink (<i>Mustela vison</i>)	1	3	0/171/330	mg/kg diet	N	na	ADL	M	FD	4	mo	90	d	JV	M	C	NR	BIO	CHM	MCHC	PL	171	330	Y	1.985	N	0.1207024	10.4	20.1	10	10	10	10	6	1	10	10	10	4	81		
2	21171	Van der Schee et al, 1980	Zinc sulfate heptahydrate	100	Sheep (<i>Ovis aries</i>)	1	3	0/223/409	mg/kg diet	N	na	ADL	M	FD	98	d	NR	NR	JV	M	C	COM	BIO	CHM	HMCT	BL	409		N	34	Y	1	12		10	10	10	10	6	1	4	1	10	4	66		
3	45270	Hill and Miller, 1983	Zinc oxide	100	Pig (<i>Sus scrofa</i>)	1	3	0/500/5000	mg/kg diet	N	na	ADL	U	FD	4	w	NR	NR	GE	F	C	COM	BIO	ENZ	ALPH	SR	500	5000	Y	55.1	Y	2.75	25.0	250	10	10	5	5	7	1	8	10	10	4	70		
4	21067	Reeves and Newman, 1997	Zinc carbonate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/350	mg/kg diet	N	na	ADL	U	FD	7	w	21	d	JV	M	C	COM	BIO	CHM	HMCT	BL	350		N	0.267	N	0.0232033	30.4		10	10	5	10	5	1	4	10	10	7	72		
5	47892	Gaynor et al, 1988	Zinc sulfate	100	Cattle (<i>Bos taurus</i>)	2	2	0/1264.0	mg/kg diet	N	na	ADL	M	FD	4	w	NR	NR	LC	F	C	COM	BIO	CHM	PRTL	MK	1264		Y	623.2	Y	15.1	30.6		10	10	10	10	7	1	4	1	10	4	67		
6	21240	Mengo et al., 1991	Zinc acetate	35.64	Rat (<i>Rattus norvegicus</i>)	1	3	0/1000/3000	mg/kg diet	N	na	ADL	U	FD	3	mo	1	mo	JV	M	C	COM	BIO	CHM	CHOL	BL	1000	3000	N	0.217	N	0.0195671	32.1	96.4	10	10	5	5	5	1	10	10	10	4	70		
7	47892	Gaynor et al, 1988	Zinc chloride	100	Cattle (<i>Bos taurus</i>)	1	2	0/1386.4	mg/kg diet	N	na	ADL	M	FD	5	w	NR	NR	LC	F	C	COM	BIO	CHM	PRTL	MK	1386.4		Y	626.2	Y	15	33.2		10	10	10	10	7	1	4	1	10	4	67		
8	36302	Brzoska et al, 2001	Zinc chloride	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/8.0	mg/org/d	N	na	ADL	U	DR	12	w	2	mo	JV	M	C	COM	BIO	CHM	CALC	TB	8		Y	0.2	Y	0.0335	40.0		10	5	5	10	7	1	4	10	10	10	72		
9	14536	Ott et al., 1966	Zinc oxide	100	Cattle (<i>Bos taurus</i>)	2	6	0/0.5/0.9/1.3/1.7/2.1	g/kg diet	N	na	ADL	U	FD	12	w	NR	NR	JV	B	C	COM	BIO	CHM	PCLV	BL	1.3	1.7	N	270	Y	8.85	42.6	55.7	10	10	5	5	6	1	10	10	10	4	71		
10	14525	Brink et al, 1959	Zinc carbonate	100	Pig (<i>Sus scrofa</i>)	1	6	0/0.05/0.10/0.20/0.40/0.80	% in diet	N	na	ADL	U	FD	42	d	NR	NR	JV	NR	C	COM	BIO	CHM	HMGL	BL	0.1	0.2	Y	47.99915	Y	2.09	43.5	87.1	10	10	5	10	7	1	10	10	10	4	77		
11	14537	Ott et al., 1966	Zinc oxide	100	Sheep (<i>Ovis aries</i>)	1	8	0/0.5/1.0/1.5/2.0/2.5/3.0/3.5	g/kg diet	N	na	ADL	U	FD	7	w	NR	NR	JV	M	C	NR	BIO	CHM	PCLV	BL	1.5	2	Y	44.5	Y	1.52	51.2	68.3	10	10	5	5	7	1	10	10	10	4	72		
12	14537	Ott et al., 1966	Zinc sulfate	100	Sheep (<i>Ovis aries</i>)	2	4	0/2.0/4.0/6.0	g/org/day	N	na	DLY	U	GV	11	d	NR	NR	JV	M	C	NR	BIO	CHM	HMGL	BL	2	4	Y	37.6	Y	1.4	53.2	106	10	8	5	10	7	1	10	10	10	4	75		
13	40436	Bentley and Grubb, 1991	Zinc carbonate	100	Rabbit (<i>Oryctolagus cuniculus</i>)	1	3	0/1000/5000	ug/g	N	na	ADL	U	FD	22	w	NR	NR	JV	B	C	COM	BIO	CHM	HMGL	BL	1000	5000	Y	3	N	0.1694925	56.5	282	10	10	5	10	6	1	8	10	10	4	74		
14	43680	Maita et al, 1981	Zinc sulfate heptahydrate	100	Rat (<i>Rattus norvegicus</i>)	4	4	0/23.2/234/2514	mg/kg bw/d	N	na	ADL	U	FD	13	w	5	w	JV	M	C	COM	BIO	CHM	HMGL	BL	234	2514	Y	0.43	Y	0.0236	234	2514	10	10	5	10	7	1	6	10	10	4	73		
15	43680	Maita et al, 1981	Zinc sulfate heptahydrate	100	Rat (<i>Rattus norvegicus</i>)	3	4	0/24.5/243/2486	mg/kg bw/d	N	na	ADL	U	FD	13	w	5	w	JV	F	C	COM	BIO	CHM	HEMT	BL	243	2486	Y	0.255	Y	0.0156	243	2486	10	10	5	10	7	1	6	10	10	4	73		
16	22300	Whanger and Weswig, 1970	Zinc carbonate	100	Rat (<i>Rattus norvegicus</i>)	1	4	0/1000/4000/8000	mg/kg diet	N	na	ADL	U	FD	10	w	21	d	JV	M	C	LAB	BIO	CHM	GBCM	BL	4000	8000	N	0.235	N	0.0208917	356	711	10	10	5	10	5	1	10	10	10	4	75		
17	43680	Maita et al, 1981	Zinc sulfate heptahydrate	100	Mouse (<i>Mus musculus</i>)	2	4	0/42.7/458/4927	mg/kg bw/d	N	na	ADL	U	FD	13	w	5	w	JV	M	C	COM	BIO	CHM	HMGL	BL	458	4927	Y	0.0453	Y	0.006	458	4927	10	10	5	10	7	1	6	10	10	10	4	73	
18	43680	Maita et al, 1981	Zinc sulfate heptahydrate	100	Mouse (<i>Mus musculus</i>)	1	4	0/46.4/479/4878	mg/kg bw/d	N	na	ADL	U	FD	13	w	5	w	JV	F	C	COM	BIO	CHM	HMGL	BL	479	4878	Y	0.0446	Y	0.00416	479	4878	10	10	5	10	7	1	6	10	10	4	73		
19	14656	O'Neil-Cutting et al, 1981	Zinc carbonate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/0.75	% in diet	N	na	ADL	U	FD	18	w	NR	NR	JV	M	C	COM	BIO	CHM	HMGL	BL	0.75		Y	0.438	N	0.034853	597		10	10	5	10	6	1	4	10	10	4	70		
20	40997	Urabe and Hayakawa, 1990	Zinc carbonate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/30	mg/g diet	N	na	ADL	U	FD	42	d	NR	NR	JV	M	C	LAB	BIO	CHM	PRTL	LI	30		Y	0.253	Y	0.0142	1684		10	10	5	10	7	1	4	10	10	4	71		
21	638	Nakamura et al., 1983	zinc acetate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/200	ug/g	N	na	ADL	U	FD	11	w	NR	NR	JV	F	C	LAB	BIO	CHM	GLUC	SR		200	Y	0.1838	Y	0.008		8.71	10	10	5	5	7	1	4	10	10	4	66		
22	36982	L'Abbe and Fischer, 1984	Zinc sulfate	100	Rat (<i>Rattus norvegicus</i>)	1	3	0/120/240	mg/kg diet	N	na	ADL	M	FD	6	w	NR	NR	JV	M	C	COM	BIO	CHM	GBCM	SR		120	N	0.235	N	0.0208917		10.7	10	10	10	10	5	1	4	10	10	4	74		
23	38623	Elliot and Walker, 1968	Zinc carbonate	100	Pig (<i>Sus scrofa</i>)	1	2	0/478	mg/kg diet	N	na	ADL	U	FD	4	w	NR	NR	JV	B	C	COM	BIO	CHM	HMGL	WO		478	Y	84	N	2.622493		14.9	10	10	5	10	6	1	4	10	10	4	70		
24	36983	L'Abbe and Fischer, 1984	Zinc sulfate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/240	mg/kg diet	N	na	ADL	U	FD	2	w	NR	NR	JV	M	C	COM	BIO	ENZ	CCOX	LI		240	N	0.217	N	0.0195671		21.6	10	10	5	10	5	1	4	10	10	4	69		
25	21011	Subramanian et al, 2000	Zinc oxide	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/400	mg/kg diet	N	na	ADL	U	FD	6	w	NR																														

Appendix 6.1 Mammalian Toxicity Data Extracted for Wildlife Toxicity Reference Value (TRV)

Zinc

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Ref			Exposure																				Effects							Conversion to mg/kg bw/day				Result		Data Evaluation Score									
Result #	Ref N.	Reference	Chemical Form	MW%	Test Species	Phase #	# of Conc/ Doses	Conc/ Doses	Conc/Dose Units	Wet Weight Reported?	Percent Moisture	Application Frequency	Method of Analyses	Route of Exposure	Exposure Duration	Duration Units	Age	Age Units	Lifestage	Sex	Control Type	Test Location	General Effect Group	Effect Type	Effect Measure	Response Site	Study NOAEL	Study LOAEL	Body Weight Reported?	Body Weight in kg	Ingestion Rate Reported?	Ingestion Rate in kg or L/day	NOAEL Dose (mg/kg/day)	LOAEL Dose (mg/kg/day)	Data Source	Dose Route	Test Concentrations	Chemical form	Dose Quantification	Endpoint	Dose Range	Statistical Power	Exposure Duration	Test Conditions	Total
57	21011	Subramanian et al, 2000	Zinc oxide	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/400	mg/kg diet	N	na	ADL	U	FD	6	w	NR	NR	JV	M	C	LAB	BEH	FDB	FCNS	WO		400	Y	0.198	Y	0.01395		28.2	10	10	5	5	7	4	4	10	10	4	69
58	36302	Brzoska et al, 2001	Zinc chloride	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/8.0	mg/org/d	N	na	ADL	U	DR	12	w	2	mo	JV	M	C	COM	BEH	FDB	WCON	WO		8	Y	0.2	Y	0.0335		40	10	5	5	10	7	4	4	10	10	10	75
Physiology																																													
59	14535	Ott et al, 1966	Zinc oxide	100	Sheep (<i>Ovis aries</i>)	1	8	0/0.5/1.0/1.5/2.0/2.5/3.0/3.5	g/kg diet	N	na	ADL	U	FD	6	w	NR	NR	JV	NR	C	NR	PHY	PHY	FDCV	WO	0.5	1	Y	45.3	Y	1.8	19.9	39.7	10	10	5	5	7	4	10	10	10	4	75
60	47892	Gaynor et al, 1988	Zinc sulfate	100	Cattle (<i>Bos taurus</i>)	2	2	0/1264.0	mg/kg diet	N	na	ADL	M	FD	4	w	NR	mo	LC	F	C	COM	PHY	PHY	FDCV	WO	1264		Y	623.2	Y	15.1	30.6		10	10	10	10	7	4	4	1	10	4	70
61	47892	Gaynor et al, 1988	Zinc chloride	100	Cattle (<i>Bos taurus</i>)	1	2	0/1386.4	mg/kg diet	N	na	ADL	M	FD	5	w	NR	NR	LC	F	C	COM	PHY	PHY	FDCV	WO	1386.4		Y	626.2	Y	15	33.2		10	10	10	10	7	4	4	1	10	4	70
62	14525	Brink et al, 1959	Zinc carbonate	100	Pig (<i>Sus scrofa</i>)	1	6	0/0.05/0.10/0.20/0.40/0.80	% in diet	N	na	ADL	U	FD	42	d	NR	NR	JV	NR	C	COM	PHY	PHY	FDCV	WO	0.1	0.2	Y	47.99915	Y	2.09	38.3	76.7	10	10	5	10	7	4	10	10	10	4	80
63	42234	Schell and Kornegay, 1996	Zinc sulfate	100	Pig (<i>Sus scrofa</i>)	2	4	0/218/624/830	mg/d	N	na	ADL	M	FD	2	w	23	d	JV	F	C	COM	PHY	PHY	FDCV	WO	830		Y	7.82	Y	0.34	106		10	10	10	10	7	4	4	1	10	4	70
64	43680	Maita et al, 1981	Zinc sulfate heptahydrate	100	Mouse (<i>Mus musculus</i>)	2	4	0/42.7/458/4927	mg/kg bw/d	N	na	ADL	U	FD	13	w	5	w	JV	M	C	COM	PHY	PHY	FDCV	WO	458	4927	Y	0.0453	Y	0.006	458	4927	10	10	5	10	7	4	6	10	6	4	72
65	43680	Maita et al, 1981	Zinc sulfate heptahydrate	100	Mouse (<i>Mus musculus</i>)	1	4	0/46.4/479/4878	mg/kg bw/d	N	na	ADL	U	FD	13	w	5	w	JV	F	C	COM	PHY	PHY	FDCV	WO	479	4878	Y	0.0327	Y	0.00416	479	4878	10	10	5	10	7	4	6	10	4	76	
66	40997	Urabe and Hayakawa, 1990	Zinc carbonate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/30	mg/g diet	N	na	ADL	U	FD	42	d	NR	NR	JV	M	C	LAB	PHY	PHY	FDCV	WO	30		Y	0.253	Y	0.0142	1684		10	10	5	10	7	4	4	10	10	4	74
67	43680	Maita et al, 1981	Zinc sulfate heptahydrate	100	Rat (<i>Rattus norvegicus</i>)	4	4	0/23.2/234/2514	mg/kg bw/d	N	na	ADL	U	FD	13	w	5	w	JV	M	C	COM	PHY	PHY	FDCV	WO	2514		Y	0.371	Y	0.0213	2514		10	10	5	10	7	4	4	3	10	4	67
68	39780	Mutafova-Yamolieva, et al, 1993	Zinc Sulfate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/100	mg/kg bw/d	N	na	ADL	U	DR	30	d	NR	NR	JV	M	C	COM	PHY	PHY	GPHY	VD		100	Y	0.1	N	0.0124634		100	10	5	5	10	10	4	4	10	10	4	72
69	14526	Cox and Hale, 1962	Zinc oxide	100	Pig (<i>Sus scrofa</i>)	1	3	0/0.2/0.4	% in diet	N	na	ADL	U	FD	69	d	NR	NR	JV	NR	C	COM	PHY	PHY	FDCV	WO		0.4	Y	59.10309	Y	1.98		134	10	10	5	5	7	4	4	10	10	4	66
Pathology																																													
70	45143	Hill et. al., 1983	Zinc oxide	100	Pig (<i>Sus scrofa</i>)	1	3	0/500/5000	mg/kg diet	N	na	ADL	U	FD	12	mo	7-8	mo	GE	F	C	COM	PTH	ORW	SMIX	LI	500	5000	Y	167	Y	2.75	8.23	82.3	10	10	5	5	7	4	8	10	10	4	73
71	14537	Ott et al., 1966	Zinc oxide	100	Sheep (<i>Ovis aries</i>)	1	8	0/0.5/1.0/1.5/2.0/2.5/3.0/3.5	g/kg diet	N	na	ADL	U	FD	7	w	NR	NR	JV	M	C	NR	PTH	ORW	ORWT	LI	0.5	1	Y	48.3	Y	1.8	18.6	37.3	10	10	5	5	7	4	10	10	10	4	75
72	21067	Reeves and Newman, 1997	Zinc carbonate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/350	mg/kg diet	N	na	ADL	U	FD	7	w	3	w	JV	M	C	COM	PTH	HIS	USTR	IN	350		N	0.267	N	0.0232033	30.4		10	10	5	10	5	4	4	1	10	7	66
73	36302	Brzoska et al, 2001	Zinc chloride	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/8.0	mg/org/d	N	na	ADL	U	DR	12	w	2	mo	JV	M	C	COM	PTH	ORW	ORWT	TB	8		Y	0.2	Y	0.0335	40		10	5	5	10	7	4	4	10	10	10	75
74	43680	Maita et al, 1981	Zinc sulfate heptahydrate	100	Rat (<i>Rattus norvegicus</i>)	4	4	0/23.2/234/2514	mg/kg bw/d	N	na	ADL	U	FD	13	w	5	w	JV	M	C	COM	PTH	ORW	ORWT	BR	234	2514	Y	0.43	Y	0.0236	234	2514	10	10	5	10	7	4	6	10	10	4	76
75	43680	Maita et al, 1981	Zinc sulfate heptahydrate	100	Rat (<i>Rattus norvegicus</i>)	3	4	0/24.5/243/2486	mg/kg bw/d	N	na	ADL	U	FD	13	w	5	w	JV	F	C	COM	PTH	ORW	ORWT	LI	243	2486	Y	0.255	Y	0.0156	243	2486	10	10	5	10	7	4	6	10	10	4	76
76	43680	Maita et al, 1981	Zinc sulfate heptahydrate	100	Mouse (<i>Mus musculus</i>)	2	4	0/42.7/458/4927	mg/kg bw/d	N	na	ADL	U	FD	13	w	5	w	JV	M	C	COM	PTH	ORW	ORWT	BR	458	4927	Y	0.0453	Y	0.006	458	4927	10	10	5	10	7	4	6	10	10	4	76
77	43680	Maita et al, 1981	Zinc sulfate heptahydrate	100	Mouse (<i>Mus musculus</i>)	1	4	0/46.4/479/4878	mg/kg bw/d	N	na	ADL	U	FD	13	w	5	w	JV	F	C	COM	PTH	ORW	ORWT	BR	479	4878	Y	0.0446	Y	0.0052	479	4878	10	10	5	10	7	4	6	10	10	4	76
78	14656	O'Neil-Cutting et al, 1981	Zinc carbonate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/0.75	% in diet	N	na	ADL	U	FD	18	w	NR	NR	JV	M	C	COM	PTH	ORW	ORWT	LI	0.75		Y	0.438	N	0.034853	597		10	10	5	10	6	4	4	8	10	4	71
79	40997	Urabe and Hayakawa, 1990	Zinc carbonate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/30	mg/g diet	N	na	ADL	U	FD	42	d	NR	NR	JV	M	C	LAB	PTH	ORW	ORWT	LI	30		N	0.253	Y	0.0142	1684		10	10	5	10	6	4	4	8	10	4	71
80	113	Seidenberg et al 1986	Zinc chloride	47.98	Mouse (<i>Mus musculus</i>)	1	2	0/150	mg/kg/d	N	na	DLY	U	GV	4	d	NR	NR	GE	F	C	LAB	PTH	GRS	BDWT	WO		150	Y	0.037	N	0.0045711		8.89	10	8	10	10	10	4	4	10	10	4	80
81	14524	Augey, et al, 1977	Zinc sulfate	100	Mouse (<i>Mus musculus</i>)	1	2	0/0.5	g/L	N	na	ADL	U	DR	12	mo	1.5-2	mo	JV	B	C	LAB	PTH	HIS	USTR	PS		0.5	Y	0.031	N	0.0043437		70.1	10	5	5	10	6	4	4	10	10	4	6

Appendix 6.1 Mammalian Toxicity Data Extracted for Wildlife Toxicity Reference Value (TRV)

Zinc

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Ref		Reference	Chemical Form	MW%	Test Species	Phase #	# of Conc/ Doses	Exposure																Effects						Conversion to mg/kg bw/day			Result		Data Evaluation Score												
Result #	Ref N.							Conc/ Doses	Conc/Dose Units	Wet Weight Reported?	Percent Moisture	Application Frequency	Method of Analyses	Route of Exposure	Exposure Duration	Duration Units	Age	Age Units	Lifestage	Sex	Control Type	Test Location	General Effect Group	Effect Type	Effect Measure	Response Site	Study NOAEL	Study LOAEL	Body Weight Reported?	Body Weight in kg	Ingestion Rate Reported?	Ingestion Rate in kg or L/day	NOAEL Dose (mg/kg/day)	LOAEL Dose (mg/kg/day)	Data Source	Dose Route	Test Concentrations	Chemical form	Dose Quantification	Endpoint	Dose Range	Statistical Power	Exposure Duration	Test Conditions	Total		
112	43587	Kumar, 1976	Zinc sulfate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/150	mg/kg diet	N	na	NR	U	FD	17	d	100	d	GE	F	C	COM	REP	REP	RSEM	WO		150	N	0.3846	N	0.0313209		12.2	10	10	5	10	5	10	4	10	10	4	78		
113	21042	Barone et al, 1998	Zinc	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/1000	mg/kg diet	N	na	ADL	U	FD	10	d	NR	NR	GE	F	C	LAB	REP	REP	PROG	WO		1000	Y	0.3945	N	0.0319821		81.1	10	10	5	4	6	10	4	10	10	4	73		
114	48540	Newman et al, 2002	Zinc acetate dihydrate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/232	mg/kg bw/d	N	na	ADL	U	FD	16	d	NR	NR	GE	F	C	COM	REP	REP	PROG	WO		232	N	0.229	N	0.0204523		232	10	10	5	5	10	10	4	10	10	7	81		
115	14664	Pal and Pal, 1987	Zinc sulfate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/4000	mg/kg diet	N	na	ADL	U	FD	18	d	120-130	d	GE	F	C	COM	REP	REP	GREP	WO		4000	N	0.3846	N	0.0313209		326	10	10	5	10	5	10	4	10	10	4	78		
116	42670	Chu and Cox, 1972	Zinc	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/0.4	% in diet	N	na	ADL	U	FD	14	d	NR	NR	LC	F	C	DOM	REP	REP	PRWT	WO		0.4	N	0.3846	N	0.0313209		326	10	10	5	4	5	10	4	10	10	4	72		
117	42838	Cox et al, 1969	Zinc oxide	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/0.4	% in diet	N	na	ADL	U	FD	22	d	NR	NR	GE	F	C	COM	REP	REP	PRWT	WO		0.4	Y	0.245	N	0.0216198		353	10	10	5	5	6	10	4	10	10	4	74		
118	25	Schlicker and Cox, 1968	Zinc oxide	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/0.4	% in diet	N	na	NR	U	FD	18	d	NR	NR	GE	F	C	COM	REP	REP	PRWT	WO		0.4	Y	0.0872	N	0.0092483		424	10	10	5	5	6	10	4	10	10	4	74		
Growth																																															
119	36003	Attia, et al, 1987	Zinc Oxide	100	Water buffalo (<i>Bubalus bubalis</i>)	1	5	0/460.28/527.70/1072.50/1129.26	mg/org/d	N	na	ADL	U	FD	90	d	7-9	mo	JV	M	C	DOM	GRO	GRO	BDWT	WO	1129.3		Y	261	N	6.659402	4.33		10	10	5	5	6	8	4	1	10	10	69		
120	25973	Huerta et al, 2002	Zinc sulfate	100	Cattle (<i>Bos taurus</i>)	1	2	0/200	mg/kg diet	N	na	ADL	U	FD	50	d	18	mo	JV	F	C	COM	GRO	GRO	BDWT	WO	200		Y	379	N	9.048949	4.78		10	10	5	10	6	8	4	1	10	10	4	68	
121	25973	Huerta et al, 2002	Zinc methionine	100	Cattle (<i>Bos taurus</i>)	2	2	0/200	mg/kg diet	N	na	ADL	U	FD	50	d	18	mo	JV	F	C	COM	GRO	GRO	BDWT	WO	200		Y	379	N	9.048949	4.78		10	10	5	10	6	8	4	1	10	10	4	68	
122	36854	Alaoui et al, 1985	Zinc acetate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/150	mg/kg diet	N	na	ADL	U	FD	5	w	NR	NR	JV	M	C	COM	GRO	GRO	BDWT	WO	150		Y	0.126	Y	0.0081	9.64		10	10	5	5	7	8	4	6	10	10	4	69	
123	45143	Hill et. al., 1983	Zinc oxide	100	Pig (<i>Sus scrofa</i>)	1	3	0/500/5000	mg/kg diet	N	na	ADL	U	FD	8	mo	7-8	mo	GE	F	C	COM	GRO	GRO	GGRO	WO	500	5000	Y	134	Y	2.75	10.3	103	10	10	5	5	7	8	8	10	10	4	77		
124	41855	Weigarnd and Kirchgessner, 1978	Zinc sulfate heptahydrate	100	Rat (<i>Rattus norvegicus</i>)	1	4	0/444/789/1701	ug/org/d	N	na	ADL	U	FD	12	d	NR	NR	JV	M	C	COM	GRO	GRO	BDWT	WO	1701		Y	0.145	N	0.0140476	11.7		10	10	5	10	6	8	4	1	10	10	4	68	
125	43242	Eisemann et al, 1979	Zinc oxide	100	Pig (<i>Sus scrofa</i>)	1	2	0/581	mg/kg diet	N	na	ADL	M	FD	16	w	6-8	w	JV	B	C	LAB	GRO	GRO	BDWT	WO	581		Y	91	Y	2.11	13.5		10	10	10	5	7	8	4	1	10	10	4	69	
126	37008	Cerklewski, 1979	Zinc carbonate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/120	mg/kg diet	N	na	ADL	U	FD	37	d	105	d	LC	F	C	LAB	GRO	GRO	BDWT	WO	120		Y	0.3742	Y	0.045	14.4		10	10	5	10	7	8	4	10	10	4	78		
127	38623	Elliot and Walker, 1968	Zinc carbonate	100	Pig (<i>Sus scrofa</i>)	1	2	0/478	mg/kg diet	N	na	ADL	U	FD	4	w	NR	NR	JV	B	C	COM	GRO	GRO	BDWT	WO	478		Y	84	N	2.622493	14.9		10	10	5	10	6	8	4	1	10	10	4	68	
128	2627	Cerklewski and Forbes, 1976	Zinc carbonate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/200	mg/kg diet	N	na	ADL	U	FD	7	w	NR	NR	JV	M	C	LAB	GRO	GRO	BDWT	WO	200		Y	0.23	Y	0.018	15.7		10	10	5	10	7	8	4	1	10	10	4	69	
129	39821	Wapnir and Lee, 1993	Zinc sulfate	40.5	Rat (<i>Rattus norvegicus</i>)	1	2	0/0.44	g/kg diet	N	na	ADL	U	FD	3	w	NR	NR	JV	M	C	COM	GRO	GRO	BDWT	WO	0.44		Y	0.25	N	0.0219818	15.7		10	10	5	10	6	8	4	1	10	10	4	68	
130	21084	Agarwal et al, 1986	Zinc oxide	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/200	mg/kg diet	N	na	NR	U	FD	14	d	9-10	w	SM	M	C	LAB	GRO	GRO	BDWT	WO	200		Y	0.216	N	0.019493	18.0		10	10	5	5	6	8	4	10	10	4	72		
131	2033	Brandt, 1983	Zinc sulfate	100	Mink (<i>Mustela vison</i>)	1	3	0/171/330	mg/kg diet	N	na	ADL	M	FD	4	mo	90	d	JV	M	C	NR	GRO	GRO	BDWT	WO	330		Y	1.9	N	0.1164373	20.2		10	10	10	10	6	8	4	10	10	4	82		
132	46830	Shankar et al, 1986	Zinc oxide	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/400	mg/kg diet	N	na	ADL	U	FD	120	d	40	d	JV	F	C	COM	GRO	GRO	BDWT	WO	400		Y	0.2779	Y	0.0201	28.9		10	10	5	5	7	8	4	10	10	4	73		
133	42289	Food and Drug Res. Lab, 1973	Zinc sulfate	100	Mouse (<i>Mus musculus</i>)	1	3	0/6.5/30.0	mg/kg bw/d	N	na	DLY	U	GV	10	d	NR	NR	GE	F	C	DOM	GRO	GRO	BDWT	WO	30		Y	0.0415	N	0.0050233	30.0		10	8	10	10	10	8	4	1	10	10	4	75	
134	21067	Reeves and Newman, 1997	Zinc carbonate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/350	mg/kg diet	N	na	ADL	U	FD	7	w	3	w	JV	M	C	COM	GRO	GRO	BDWT	WO	350		N	0.267	N	0.0232033	30.4		10	10	5	10	5	8	4	10	10	7	79		
135	47892	Gaynor et al, 1988	Zinc sulfate	100	Cattle (<i>Bos taurus</i>)	2	2</																																								

Appendix 6.1 Mammalian Toxicity Data Extracted for Wildlife Toxicity Reference Value (TRV)

Zinc

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Ref			Exposure															Effects										Conversion to mg/kg bw/day				Result		Data Evaluation Score											
Result #	Ref N.	Reference	Chemical Form	MW%	Test Species	Phase #	# of Conc/ Doses	Conc/ Doses	Conc/Dose Units	Wet Weight Reported?	Percent Moisture	Application Frequency	Method of Analyses	Route of Exposure	Exposure Duration	Duration Units	Age	Age Units	Lifestage	Sex	Control Type	Test Location	General Effect Group	Effect Type	Effect Measure	Response Site	Study NOAEL	Study LOAEL	Body Weight Reported?	Body Weight in kg	Ingestion Rate Reported?	Ingestion Rate in kg or L/day	NOAEL Dose (mg/kg/day)	LOAEL Dose (mg/kg/day)	Data Source	Dose Route	Test Concentrations	Chemical form	Dose Quantification	Endpoint	Dose Range	Statistical Power	Exposure Duration	Test Conditions	Total
169	25	Schlicker and Cox, 1968	Zinc oxide	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/0.4	% in diet	N	na	NR	U	FD	18	d	NR	NR	GE	F	C	COM	GRO	GRO	BDWT	WO		0.4	Y	0.0872	N	0.0092483		424	10	10	5	5	6	8	4	10	6	4	68
170	38015	Settl mire and Matrone, 1967	Zinc carbonate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/0.75	% in diet	N	na	NR	U	FD	5	w	4-6	w	JV	M	C	LAB	GRO	GRO	BDWT	WO		0.75	N	0.235	N	0.0208917		667	10	10	5	10	5	8	4	10	10	4	76
171	42961	Ogiso, et. al., 1974	Zinc carbonate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/1	% in diet	N	na	ADL	U	FD	15	d	NR	NR	JV	M	C	COM	GRO	GRO	BDWT	WO		1	Y	0.1558	N	0.0149021		956	10	10	5	10	6	8	4	10	10	4	77
172	43264	Scott and Magee, 1979	Zinc carbonate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/0.75	% in diet	N	na	ADL	U	FD	1	w	NR	NR	JV	M	C	COM	GRO	GRO	BDWT	WO		0.75	Y	0.029	N	0.0037415		968	10	10	5	10	6	8	4	10	10	4	77
Survival																																													
173	113	Seidenberg et al 1986	Zinc chloride	47.98	Mouse (<i>Mus musculus</i>)	1	2	0/150	mg/kg/d	N	na	DLY	U	GV	4	d	NR	NR	GE	F	C	LAB	MOR	MOR	MORT	WO	150		Y	0.037	N	0.0045711	8.89		10	8	10	10	10	9	4	10	10	4	85
174	21171	Van der Schee et al, 1980	Zinc sulfate heptahydrate	100	Sheep (<i>Ovis aries</i>)	1	3	0/223/409	mg/kg diet	N	na	ADL	M	FD	98	d	NR	NR	JV	M	C	COM	MOR	MOR	MORT	WO	409		N	34	Y	1	12.0		10	10	10	10	6	9	4	10	10	4	83
175	42289	Food and Drug Res. Lab, 1973	Zinc sulfate	100	Mouse (<i>Mus musculus</i>)	1	3	0/6.5/30.0	mg/kg bw/d	N	na	DLY	U	GV	10	d	NR	NR	GE	F	C	DOM	MOR	MOR	SURV	WO	30		Y	0.0415	N	0.0050233	30.0		10	8	10	10	10	9	4	1	10	4	76
176	42289	Food and Drug Res. Lab, 1973	Zinc sulfate	100	Rat (<i>Rattus norvegicus</i>)	2	4	0/2.0/9.1/42.5	mg/kg bw/d	N	na	DLY	U	GV	10	d	NR	NR	GE	F	C	DOM	MOR	MOR	SURV	WO	42.5		Y	0.269	N	0.023346	42.5		10	8	10	10	10	9	4	1	10	4	76
177	14525	Brink et al, 1959	Zinc carbonate	100	Pig (<i>Sus scrofa</i>)	1	6	0/0.05/0.10/0.20/0.40/0.80	% in diet	N	na	ADL	U	FD	42	d	NR	NR	JV	NR	C	COM	MOR	MOR	MORT	WO	0.1	0.2	Y	47.99915	Y	2.09	43.5	87.1	10	10	5	10	7	9	10	10	4	85	
178	42292	Food and Drug Res. Lab, 1974	Zinc sulfate	100	Rabbit (<i>Oryctolagus cuniculus</i>)	1	5	0/0.6/2.8/13.0/60.0	mg/kg bw/d	N	na	DLY	U	GV	13	d	NR	NR	GE	F	C	DOM	MOR	MOR	MORT	WO	60		Y	3.21	N	0.1791859	60.0		10	8	10	10	10	9	4	1	10	4	76
179	14535	Ott et al, 1966	Zinc oxide	100	Sheep (<i>Ovis aries</i>)	1	8	0/0.5/1.0/1.5/2.0/2.5/3.0/3.5	g/kg diet	N	na	ADL	U	FD	6	w	NR	NR	JV	NR	C	NR	MOR	MOR	MORT	WO	2.5	3	Y	40.7	Y	1.35	82.9	99.5	1										

Appendix 6.1 Mammalian Toxicity Data Extracted for Wildlife Toxicity Reference Value (TRV)

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Ref			Exposure															Effects							Conversion to mg/kg bw/day			Result		Data Evaluation Score															
Result #	Ref N.	Reference	Chemical Form	MW%	Test Species	Phase #	# of Conc/ Doses	Conc/ Doses	Conc/Dose Units	Wet Weight Reported?	Percent Moisture	Application Frequency	Method of Analyses	Route of Exposure	Exposure Duration	Duration Units	Age	Age Units	Lifestage	Sex	Control Type	Test Location	General Effect Group	Effect Type	Effect Measure	Response Site	Study NOAEL	Study LOAEL	Body Weight Reported?	Body Weight in kg	Ingestion Rate Reported?	Ingestion Rate in kg or L/day	NOAEL Dose (mg/kg/day)	LOAEL Dose (mg/kg/day)	Data Source	Dose Route	Test Concentrations	Chemical form	Dose Quantification	Endpoint	Dose Range	Statistical Power	Exposure Duration	Test Conditions	Total
225	14524	Augey, et al, 1977	Zinc sulfate	100	Mouse (<i>Mus musculus</i>)	1	2	0/0.5	g/L	N	na	ADL	U	DR	6	mo	1.5-2	mo	JV	B	C	LAB	BIO	CHM	GLUC	PL	0.5		Y	0.031	N	0.0043437	70.1		10	5	5	10	6	1	4	1	10	4	56
226	14524	Augey, et al, 1977	Zinc sulfate	100	Mouse (<i>Mus musculus</i>)	1	2	0/0.5	g/L	N	na	ADL	U	DR	12	mo	1.5-2	mo	JV	B	C	LAB	GRO	GRO	BDWT	WO	0.5		Y	0.031	N	0.0043437	70.1		10	5	5	10	6	8	4	1	10	4	63
227	14685	Miller et al., 1989	Zinc sulfate	100	Cattle (<i>Bos taurus</i>)	1	3	0/1000/2000	mg/kg diet	N	na	ADL	U	FD	14	w	NR	NR	LC	F	C	COM	BIO	CHM	PCLV	BL	2000		Y	565	Y	22	77.9		10	10	5	10	7	1	4	1	10	4	62
228	14536	Ott et al., 1966	Zinc oxide	100	Cattle (<i>Bos taurus</i>)	1	4	0/1.1/2.1/3.1	g/kg diet	N	na	ADL	U	FD	35	d	NR	NR	JV	M	C	COM	BIO	CHM	HMGL	BL	3.1		N	270	Y	6.87	78.9		10	10	5	5	6	1	4	1	10	4	56
229	34167	Elsenhans et al, 1993	Zinc sulfate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/1000	mg/kg diet	N	na	ADL	U	FD	2	w	NR	NR	NR	F	C	COM	GRO	GRO	BDWT	WO	1000		N	0.35	N	0.0289855	82.8		10	10	5	10	5	8	4	3	3	4	62
230	14385	Willoughby et al, 1972	Zinc oxide	100	Horse (<i>Equus caballus</i>)	1	2	0/5400	mg/kg diet	N	na	ADL	M	FD	9	w	3-4	w	JV	B	C	COM	BIO	CHM	PCLV	BL	5400		N	181.44	Y	2.81232	83.7		10	10	10	5	6	1	4	1	10	4	61
231	14376	Hsu et al, 1975	Zinc oxide	100	Pig (<i>Sus scrofa</i>)	1	2	0/4000	mg/kg diet	N	na	ADL	U	FD	13	w	4	w	JV	NR	C	DOM	BEH	FDB	FCNS	WO	4000		Y	64.92	Y	1.446	89.1		10	10	5	5	7	4	4	3	10	4	62
232	38511	Katouli, et al, 1999	Zinc oxide	100	Pig (<i>Sus scrofa</i>)	1	2	0/2500	mg/kg diet	N	na	ADL	U	FD	4	w	35	d	JV	B	C	DOM	GRO	GRO	BDWT	WO	2500		N	31.5	N	1.17103	92.9		10	10	5	5	5	8	4	1	10	4	62
233	45270	Hill and Miller, 1983	Zinc oxide	100	Pig (<i>Sus scrofa</i>)	1	3	0/500/5000	mg/kg diet	N	na	ADL	U	FD	20	w	NR	NR	GE	F	C	COM	GRO	GRO	BDWT	WO	5000		Y	140.6	Y	2.75	97.8		10	10	5	5	7	8	4	1	10	4	64
234	42234	Schell and Komegay, 1996	Zinc oxide	100	Pig (<i>Sus scrofa</i>)	1	4	0/236/572/762	mg/d	N	na	ADL	M	FD	2	w	23	d	JV	B	C	COM	BEH	FDB	FCNS	WO	762		Y	7.4	Y	0.26	103		10	10	10	5	7	4	4	1	10	4	65
235	42234	Schell and Komegay, 1996	Zinc oxide	100	Pig (<i>Sus scrofa</i>)	1	4	0/236/572/762	mg/d	N	na	ADL	M	FD	2	w	23	d	JV	B	C	COM	PHY	PHY	FDCV	WO	762		Y	7.4	Y	0.26	103		10	10	10	5	7	4	4	1	10	4	65
236	14526	Cox and Hale, 1962	Zinc oxide	100	Pig (<i>Sus scrofa</i>)	1	3	0/0.2/0.4	% in diet	N	na	ADL	U	FD	69	d	NR	NR	JV	NR	C	COM	BIO	CHM	HMGL	BL	0.4		Y	59.10309	Y	1.98	134		10	10	5	5	7	1	4	1	10	4	57
237	14526	Cox and Hale, 1962	Zinc oxide	100	Pig (<i>Sus scrofa</i>)	1	3	0/0.2/0.4	% in diet	N	na	ADL	U	FD	69	d	NR	NR	JV	NR	C	COM	GRO	GRO	BDWT	WO	0.4		Y	59.10309	Y	1.98	134		10	10	5	5	7	8	4	1	10	4	64
238	14526	Cox and Hale, 1962	Zinc oxide	100	Pig (<i>Sus scrofa</i>)	1	3	0/0.2/0.4	% in diet	N	na	ADL	U	FD	69	d	NR	NR	JV	NR	C	COM	BEH	FDB	FCNS	WO	0.4		Y	59.10309	Y	1.98	134		10	10	5	5	7	4	4	1	10	4	60
239	45142	Hill et al, 1983	Zinc oxide	100	Pig (<i>Sus scrofa</i>)	1	3	0/500/5000	mg/kg diet	N	na	ADL	U	FD	3	w	7-8	mo	LC	F	C	COM	BIO	CHM	CALC	MK	5000		Y	100	Y	2.75	138		10	10	5	5	7	1	4	1	10	4	57
240	42838	Cox et al, 1969	Zinc oxide	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/0.4	% in diet	N	na	ADL	U	FD	22	d	NR	NR	GE	F	C	COM	PTH	ORW	ORWT	LI	0.4		Y	0.245	N	0.0216198	353		10	10	5	5	6	4	4	6	10	4	64
241	14662	Ansari et al, 1976	Zinc oxide	100	Rat (<i>Rattus norvegicus</i>)	1	8	0/1200/2400/3600/4800/6000/720	mg/kg diet	N	na	ADL	U	FD	21	d	35	d	JV	M	C	COM	GRO	GRO	BDWT	WO	8400		Y	0.1893	Y	0.019	843		10	10	5	5	7	8	4	1	10	4	64
242	14662	Ansari et al, 1976	Zinc oxide	100	Rat (<i>Rattus norvegicus</i>)	1	8	0/1200/2400/3600/4800/6000/720	mg/kg diet	N	na	ADL	U	FD	21	d	35	d	JV	M	C	COM	BEH	FDB	FCNS	WO	8400		Y	0.1893	Y	0.019	843		10	10	5	5	7	4	4	1	10	4	60
243	21045	Bui, et al, 1998	Zinc	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/0.09746	mg/g bw	N	na	ADL	M	GV	7	d	NR	NR	GE	F	V	COM	BIO	CHM	MCPR	LI	0.9746		Y	0.2562	N	0.0224289	975		10	8	10	4	10	1	4	1	10	4	62
244	43680	Maita et al, 1981	Zinc sulfate heptahydrate	100	Rat (<i>Rattus norvegicus</i>)	3	4	0/24.5/243/2486	mg/kg bw/d	N	na	ADL	U	FD	13	w	5	w	JV	F	C	COM	BEH	FDB	FCNS	WO	2486		Y	0.231	Y	0.0149	2486		10	10	5	10	7	4	4	1	10	4	65
245	43680	Maita et al, 1981	Zinc sulfate heptahydrate	100	Rat (<i>Rattus norvegicus</i>)	3	4	0/24.5/243/2486	mg/kg bw/d	N	na	ADL	U	FD	13	w	5	w	JV	F	C	COM	PHY	PHY	FDCV	WO	2486		Y	0.231	Y	0.0149	2486		10	10	5	10	7	4	4	1	10	4	65
246	43680	Maita et al, 1981	Zinc sulfate heptahydrate	100	Mouse (<i>Mus musculus</i>)	1	4	0/46.4/479/4878	mg/kg bw/d	N	na	ADL	U	FD	13	w	5	w	JV	F	C	COM	BEH	FDB	FCNS	WO	4878		Y	0.0327	Y	0.0036	4878		10	10	5	10	7	4	4	1	10	4	65
247	43680	Maita et al, 1981	Zinc sulfate heptahydrate	100	Mouse (<i>Mus musculus</i>)	2	4	0/42.7/458/4927	mg/kg bw/d	N	na	ADL	U	FD	13	w	5	w	JV	M	C	COM	BEH	FDB	FCNS	WO	4927		Y	0.0386	Y	0.0054	4927		10	10	5	10	7	4	4	1	10	4	65
248	21006	Sinha, et al, 1989	Zinc	100	Rat (<i>Rattus norvegicus</i>)	1	3	0/500/1000	mg/kg diet	N	na	ADL	U	FD	3	w	NR	NR	JV	B	C	COM	BIO	ENZ	ALPH	OV		500	Y	0.204	Y	0.00179		4.39	10	10	5	4	7	1	4	10	10	4	65
249	45042	Katya-Katya et al., 1984	Zinc acetate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/200	mg/kg diet	N	na	ADL	U	FD	3	mo	10	w	JV	M	C	LAB	BIO	CHM	CHOL	PL		200	N	0.462	N	0.036416		15.8	10	10	5	5	5	1	4	10	10	4	64
250	21131	Perry et al, 1980	Zinc acetate	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/200	mg/L	N	na	ADL	U	DR	18	mo	NR	NR	JV	F	C	COM	PHY	PHY	BLPR	WO		200	N	0.179	N	0.0210476		23.5	10	5	5	5	5	1	4	10	10	4	62
251	39430	Reeves, 1995	Zinc	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/350	mg/kg diet	N	na	ADL	U	FD	5	d	8	w	JV	B	C	COM	BIO	CHM	GBCM	IN		350	N	0.267	N	0.0232033		30.4	10	10	5	4	5	1	4	10	10	4	63
252	668	Bonner et al 1980	Zinc	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/300	mg/kg diet	N	na	NR	U	FD	8	w	NR	NR	JV	M	C	NR	BIO	ENZ	ALPH	BO		300	Y	0.1	N	0.0103504		31.1	10	10	5	4	6	1	4	10	10	4	64
253	21042	Barone et al, 1998	Zinc	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/1000	mg/kg diet	N	na	ADL	U	FD	10	d	NR	NR	GE	F	C	LAB	BIO	CHM	MCPR	LI		1000	Y	0.3945	N	0.0319821		81.1	10	10	5	4	6	1	4	10	10	4	64
254	42767	Chu and Cox, 1970	Zinc oxide	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/0.4	% in diet	N	na	ADL	U	FD	21	d	NR	NR	LC	F	C	COM	BIO	ENZ	GENZ	MK		0.4	Y	0.268	N	0.0232747		347	10	10	5	5	6	1	4	10	10	4	65
255	42838	Cox et al, 1969	Zinc oxide	100	Rat (<i>Rattus norvegicus</i>)	1	2	0/0.4	% in diet	N	na	ADL	U	FD	22	d	NR	NR	GE	F	C	COM	BIO	CHM	CALC	KI		0.4	Y	0.245	N	0.0216198		353	10	10	5	5	6	1	4				

All abbreviations and definitions are used in coding stuides are available from Attachment 4-3 of the Eco-SSL guidance(U.S. EPA 2003).

Duplicate values for NOAELs and LOAELs for the same reference represent results from different experimental designs and are identified by different Phase numbers.

