



DDT, DDE, AND DDD

Agency for Toxic Substances and Disease Registry

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This fact sheet answers the most frequently asked health questions about DDT, DDE, and DDD. For more information, you may call 404-639-6000. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to DDE, DDE, and DDD happens mostly from eating contaminated foods, such as root and leafy vegetables, meat, fish, and poultry. At high levels, it can damage the nervous system, causing excitability, tremors, and seizures in people. These chemicals have been found in at least 337 of 1,416 National Priorities List sites identified by the Environmental Protection Agency.

What are DDT, DDE, and DDD?

(Pronounced DDT, DDE and DDD)

DDT (1,1,1-trichloro-2,2-bis(p-chlorophenyl)ethane) was a manufactured chemical widely used to control insects on agricultural crops and insects that carry diseases like malaria and typhus. It does not occur naturally in the environment. DDT is a white, crystalline solid with no odor or taste.

Because of damage to wildlife and the potential harm to human health, the use of DDT was banned in the United States, except for public health emergencies. DDT is still used in some other countries.

Two similar chemicals that sometimes contaminate DDT products are DDE (1,1-dichloro-2,2-bis(chlorophenyl)ethylene) and DDD (1,1-dichloro-2,2-bis(p-chlorophenyl)ethane). DDD was also used to kill pests, but its use has also been banned. One form of it has been used medically to treat cancer of the adrenal gland. DDE has no commercial use.

What happens to DDT, DDE, and DDD when they enter the environment?

- DDT entered the environment when it was used as an insecticide.
- DDT in air lasts for only a short time. Half the DDT in air is gone within 2 days.

- It does not dissolve easily in water.
- DDT sticks strongly to soil particles and does not move quickly to underground water.
- DDT lasts a very long time in soil; half the DDT in soil will break down in 2-15 years.
- Some DDT will evaporate from soil and surface water into the air and some is broken down by sunlight or by microorganisms in soil or surface water.
- DDT in soil usually breaks down to form DDE or DDD.
- Levels of DDT build up in plants and in the fatty tissues of fish, birds, and animals.

How might I be exposed to DDT, DDE, and DDD?

- Eating domestic foods, such as root and leafy vegetables, fatty meat, fish, and poultry, but levels are very low
- Eating imported foods from countries that still allow the use of DDT to control pests
- Breathing contaminated air or drinking contaminated water; levels generally are low and of little concern except near waste sites and landfills that may contain higher levels of these chemicals
- Infants fed on human breast milk from mothers who have been exposed
- Breathing or swallowing soil particles near waste sites or landfills that contain these chemicals.

How can DDT, DDE, and DDD affect my health?

DDT affects the nervous system. People who accidentally swallowed large amounts of DDT became excitable and had tremors and seizures. These effects went away after the exposure stopped. No effects were seen in people who took small daily doses of DDT by capsule for 18 months.

People who worked with DDT for a long time had some reversible changes in the levels of liver enzymes.

In animals, short-term exposure to large amounts of DDT in food affected the nervous system. In animals, long-term exposure to DDT affected the liver. Animal studies suggest that short-term exposure to DDT in food may have a harmful effect on reproduction.

How likely are DDT, DDE, and DDD to cause cancer?

The Department of Health and Human Services (DHHS) has determined that DDT may reasonably be anticipated to be a human carcinogen. DHHS has not classified DDE and DDD, but the Environmental Protection Agency (EPA) has determined that they are probable human carcinogens.

Liver cancer has been seen in animals that were fed DDT. Studies in DDT-exposed workers did not show increases in cancer.

Is there a medical test to show whether I've been exposed to DDT, DDE, and DDD?

Laboratory tests can detect DDT, DDE, and DDD in fat, blood, urine, semen, and breast milk. These tests may show low, moderate, or excessive exposure to these compounds.

These tests cannot show the exact amount of DDT, DDE, or DDD to which a person was exposed or tell if harmful effects will occur. These tests are not routinely available at doctors' offices.

Has the federal government made recommendations to protect human health?

In 1972, the EPA banned all uses of DDT, except for public health emergencies. EPA requires spills or releases of DDT into the environment of 1 pound or more to be reported to EPA.

The Food and Drug Administration (FDA) has set limits on DDT levels in most foods.

The Occupational Safety and Health Administration (OSHA) set an exposure limit of 1 milligram of DDT per cubic meter (1 mg/m³) in workplace air for an 8-hour workday, 40-hour workweek. The National Institute for Occupational Safety and Health (NIOSH) recommends an exposure limit of 0.5 mg/m³ in workplace air over a 10-hour workday, 40-hour workweek.

Glossary

Carcinogen: A substance that can cause cancer

Evaporate: To change into a vapor or a gas

Milligram (mg): One thousandth of a gram

Short-term: Lasting 14 days or less

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1994. Toxicological profile for 4,4'-DDT, 4,4'-DDE, 4,4'-DDD (Update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns. For more information, contact: Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone: 404-639-6000, FAX: 404-639-6315.

