

This fact sheet answers the most frequently asked health questions (FAQs) about guthion. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information 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.

HIGHLIGHTS: Exposure to guthion may occur primarily by ingesting food (mostly fruits) treated with this pesticide. Exposure to high amounts of guthion may cause difficulty breathing, chest tightness, vomiting, cramps, diarrhea, blurred vision, sweating, headaches, dizziness, loss of consciousness, and death. Guthion has been found in at least 5 of the 1,678 National Priority List (NPL) sites identified by the Environmental Protection Agency (EPA).

What is guthion?

Guthion, also called azinphos-methyl, is an organophosphorous pesticide that was used on many crops, especially apples, pears, cherries, peaches, almonds, and cotton. Many of its former uses have been cancelled by the EPA, and its few remaining uses are currently in the process of being phased out.

Guthion is a synthetic substance, it does not occur naturally. Pure guthion is a colorless to white odorless crystalline solid that melts at about 72–74 °C (162–165 °F). Technical-grade guthion is a cream to yellow-brown granular solid. Guthion is poorly soluble in water.

What happens to guthion when it enters the environment?

- Guthion enters the environment primarily through spraying on farm crops. In general, it is not considered a persistent chemical in the environment.
- It does not evaporate very quickly from soil and water.
- It attaches strongly to soil surfaces and does not easily move through the soil into groundwater.
- It is degraded in soil and water by microorganisms.
- It is also degraded by sunlight and by reacting with water.
- Guthion does not accumulate to a significant degree in the food chain.

How might I be exposed to guthion?

- Exposure of the general population may occur primarily by ingesting foods treated with guthion.

- Farm workers, chemical sprayers, and people who work in factories that make guthion are most likely to be exposed by skin contact and inhalation.
- People who live near landfills where it has been dumped may be exposed.
- Individuals may also be exposed by going into fields too soon after spraying.
- You may be exposed if a family member works with guthion and residues of the chemical remain on his or her hands, clothing, or vehicle.

How can guthion affect my health?

Guthion interferes with the normal way that the nerves and brain function. Exposure to very high levels of guthion for a short period in air, water, or food may cause difficulty breathing, chest tightness, vomiting, cramps, diarrhea, blurred vision, sweating, headaches, dizziness, loss of consciousness, and death. If persons who are exposed to high amounts of guthion are rapidly given appropriate treatment, there may be no long-term harmful effects. If people are exposed to levels of guthion below those that affect nerve function, few or no health problems seem to occur.

We do not know if guthion affects the ability of humans to reproduce. Exposure to guthion did not affect fertility in animal studies.

ToxFAQs™ Internet address is <http://www.atsdr.cdc.gov/toxfaq.html>

How likely is guthion to cause cancer?

It is not known if guthion causes cancer in humans. Guthion was not carcinogenic in male or female mice or in female rats that were fed this substance for more than 1 year. Some tumors were observed in male rats, but it could not be conclusively shown that guthion had caused the tumors.

The Department of Health and Human Services (DHHS) and the International Agency for Research on Cancer (IARC) have not classified guthion as to its carcinogenicity. In 1993, EPA concluded that there was a lack of evidence of carcinogenicity of guthion in rats and mice. Currently, the EPA has no carcinogenicity classification for guthion.

How can guthion affect children?

Children can be exposed to guthion in the same way adults are, except for exposures of adults at work. However, since children have more fruits in their diets, their exposure to guthion through consumption of fruits may be higher than for adults on a body weight basis.

It is likely that the effects seen in children exposed to high levels of guthion will be similar to the effects seen in adults. It is not known whether children are more sensitive to the effects of guthion than adults.

We do not know whether guthion can cause birth defects or other developmental alterations in children. Studies in animals have found decreases in the growth of the fetus, nervous system damage, and reduced survival, but only at doses that also caused harmful effects in the mothers.

How can families reduce the risks of exposure to guthion?

- Stay away from agricultural areas that have been treated with guthion.
- During spraying operations, remain indoors or leave the area for a short time.
- Agricultural workers who come in contact with guthion should remove contaminated clothing and wash before coming in contact with family members.
- Always wash fruits and vegetables before consuming them.
- If you pick your own fruit in an orchard, wash your hands when you get home because guthion can be absorbed through the skin.

- Children should avoid playing in soils near uncontrolled hazardous waste sites where guthion may have been discarded.

Is there a medical test to determine whether I've been exposed to guthion?

It is difficult to detect unchanged guthion in the body because it rapidly changes into other compounds in the body. Degradation products of guthion can be measured in the urine. However, these are not specific for guthion, but may also indicate exposure to other organophosphorous compounds. These tests are not routinely performed at your doctor's office, but your doctor can take samples and send them to a testing laboratory.

Guthion, like other organophosphorous pesticides, interferes in the human body with an enzyme called acetylcholinesterase. A blood test that measures this enzyme in the plasma or red blood cells may be useful for detecting exposures to potentially harmful levels of a variety of pesticides, including guthion.

Has the federal government made recommendations to protect human health?

Guthion is classified as a restricted use pesticide, meaning that guthion is limited to use by or under the direct supervision of a certified applicator for agricultural crop uses.

The EPA has established tolerances for guthion residues that range from 0.2 to 5 parts per million in raw agricultural commodities.

The Occupational Safety and Health Administration (OSHA) has set a limit for guthion of 0.2 milligrams per cubic meter (mg/m³) in workplace air to protect workers during an 8hour workday for a 40hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) designated a limit of 10 mg/m³ as a concentration that is Immediately Dangerous to Life and Health.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2006. Toxicological Profile for Guthion (Draft for Public Comment). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Environmental Medicine, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>. 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.

