

What is iron phosphate?

Iron phosphate is a compound that combines phosphorous and oxygen with iron. It can kill slugs and snails when eaten. The toxicity of iron compounds like this depends on the amount of available iron. Iron is an essential mineral for plants and animals. It can be found in the environment, foods, and water. Iron phosphate has been registered for use in pesticide products in the United States since 1997.



What are some products that contain iron phosphate?

[Products](#) containing iron phosphate are generally formulated as granules. They are used in home gardens and a wide variety of crops and ornamental plants to control [slugs and snails](#). There are about two dozen products containing iron phosphate on the market in the United States. Some of these have been approved for use in [organic agriculture](#).

Always [follow label instructions](#) and take steps to minimize exposure. If any exposures occur, be sure to follow the First Aid instructions on the product label carefully. For additional treatment advice, contact the Poison Control Center at 1-800-222-1222. If you wish to discuss a pesticide problem, please call 1-800-858-7378.

How does iron phosphate work?

Iron phosphate is a stomach poison in slugs and snails. It damages their digestive tissue. With enough exposure, they stop eating altogether and slowly die. The exact mode of action is not clearly understood.

How might I be exposed to iron phosphate?

Iron and phosphate ions are found in many foods naturally. Iron phosphate is used to fortify foods such as bread. Other foods, such as pasta, milk, and beverages, are also fortified with forms of iron. Iron phosphate is Generally Recognized As Safe (GRAS) by the Food & Drug Administration (FDA). However, dogs have become sick after eating large amounts of iron. This happens when vitamins, fertilizers, or slug baits are accessible.

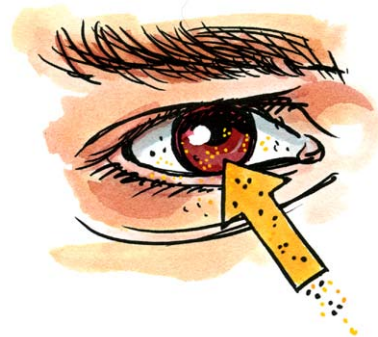
You can be exposed if you are applying slug baits with iron phosphate and you get it on your skin, breathe it in, or accidentally eat or drink a product. You can [limit your exposure](#) and reduce risk by following all label instructions carefully.



What are some signs and symptoms from a brief exposure to iron phosphate?

Iron phosphate is considered very low in toxicity when eaten. However, eating too much iron can cause stomach upset in humans and in animals. Diarrhea, vomiting, and depression have been reported. In severe cases of iron poisoning, symptoms might resolve temporarily and return 12 - 96 hours after the first signs appeared. At this stage, problems with blood pressure and heart rate can lead to shock and sometimes death. Weakness, muscle tremors and liver failure have also been reported.

Iron phosphate may cause slight irritation to the eyes and little or no irritation to the skin. No information could be found describing its toxicity when inhaled. However, iron phosphate is not likely to be inhaled. This is because it is made in a granular form and does not release vapors into the air.



What happens to iron phosphate when it enters the body?

In people and pets, iron and phosphate come apart within the body. A portion of the iron can be absorbed into the bloodstream. The amount absorbed is based on the level of iron already in the blood. Proteins transport the iron through the body.

Iron serves essential functions in blood cells, energy production, and certain enzymes. Iron is found in every cell of the body. When there is too much iron for the proteins to carry, iron can break up cell membranes as it travels unbound in the body. This can allow the free iron particles to penetrate the walls of the bloodstream, liver, heart and brain. Even when exposures are high, very little of the iron absorbed into the body is excreted.

Is iron phosphate likely to contribute to the development of cancer?

Iron and phosphate have been part of the normal human diet throughout history. When the U.S. Environmental Protection Agency and FDA evaluated iron phosphate for safety, cancer studies were not required. In cell studies, iron phosphate did not cause gene mutations.

Has anyone studied non-cancer effects from long-term exposure to iron phosphate?

No studies on the effects of long term exposure to iron phosphate could be located. However, researchers have evaluated iron supplements by giving human volunteers daily doses of iron sulfate for weeks. They took at least 50 mg of iron daily. Many of them (25-50%) had symptoms of stomach upset, including things like abdominal pain, nausea, vomiting, heartburn, diarrhea, and constipation. Headaches, heartburn and skin rashes were also reported. The average human diet contains 10-15 mg of iron per day.

Human studies including [pregnant women](#), infants and children showed that iron does not cause problems with birth, growth or development. When chickens, and pregnant rats and mice were fed iron sulfate, there were no effects for the mothers or offspring.

Are children more sensitive to iron phosphate than adults?

[Children may be especially sensitive to pesticides](#) compared to adults. However, there are currently no data to conclude that children have increased sensitivity specifically to iron phosphate. Recommendations for iron intake are lower for infants and children than they are for adults.



What happens to iron phosphate in the environment?

Iron and phosphate occur naturally in soil, and they do not become airborne. Slug and snail bait applications can add to the iron and phosphate in soils. However, they are often applied to soil in larger amounts as fertilizer. Iron and phosphate are also essential to animal and plant nutrition. Once applied, iron becomes part of compounds that are naturally found in soil. They stick to soil particles, and act as a bridge to bind particles together.

Bacteria can turn iron into forms that dissolve readily in water, but they are quickly converted back. Phosphate does not dissolve well in water, either. Iron and phosphate don't move with water but tend to stay put. They are considered persistent. However, due to their low toxicity and mobility, groundwater concerns have not been identified.

Can iron phosphate affect birds, fish, or other wildlife?

Iron phosphate is practically non-toxic to birds, based on testing with quail. Beetles and earthworms were not affected in studies using twice the amount of iron phosphate allowed. Iron phosphate is practically non-toxic to fish, water fleas, and algae. Exposure to bees is unlikely because it is applied to soil as granules.

Where can I get more information?

For more detailed information about iron phosphate please visit the list of [referenced resources](#) or call the National Pesticide Information Center, between 8:00 AM and 12:00 PM Pacific Time (11:00 AM to 3:00 PM Eastern Time), Monday - Friday, at 1-800-858-7378 or visit us on the web at <http://npic.orst.edu>. NPIC provides objective, science-based answers to questions about pesticides.

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