

Facts About Dioxin

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What Is Dioxin?

Dioxin is the common name for a group of toxic chemicals that are often made as unwanted byproducts of burning wastes and chemical manufacturing. These chemicals are colorless, odorless compounds containing carbon, hydrogen, oxygen, and chlorine.

There are hundreds of chemicals that make up the group called dioxins and related furans. Often when the term "dioxin" is used, the specific chemical being discussed is 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD). This chemical is considered the most harmful of the group.

Where Does It Come From?

Dioxin is not made intentionally. It is released to the air, water, and land from a variety of mostly industrial activities. It results from burning or as an unwanted byproduct in the manufacture of many chemicals.

Incineration of municipal, medical, or hazardous wastes is the major source of dioxin. The manufacture and use of chemicals, such as weed killers and wood preservatives, is recognized as another significant source of dioxin.

Burning coal and oil for energy also produces dioxin. Other common, but lesser, sources of dioxin include car and truck exhaust, cigarette smoke, and wood and forest fires.

Where Is It Found?

Dioxin is present all over the earth. It is found in small amounts in soil, air, and water. It is also found in most plants and animals, including people.

Air gets polluted when dioxin is carried on dust or soot. While in the air, dioxin can be breathed in by people and animals. The dioxin attached to dust will also fall onto oceans, lakes, rivers, plants, animals, and people.

Water polluted with dioxin results in dioxin being swallowed or otherwise taken in by underwater animals, including fish and other seafood.

Plants do not generally absorb dioxin. Small amounts of dioxin may also fall on plants when certain pesticides are used. Because we are learning more and more about dioxin, we know that pesticides have very small amounts of dioxin. When pesticides are used properly, the small amounts of dioxin, if any, in the pesticides will not harm people or animals.

Animals eat plants that usually are not washed. Dioxin on an unwashed plant or feed that is eaten by an animal becomes part of the animal. Animals also come in contact with dioxin when they touch or eat polluted soil.

People may come into contact with very small amounts of dioxin when we eat meat, fish, and dairy products. The Food and Drug Administration regulates these foods products to make sure that people are not exposed to harmful levels of dioxin.

Any dioxin that falls on fruits and vegetables can mostly be removed by washing.

Fortunately, the amount of dioxin found in most people and animals is too small to cause harmful health effects.

What Are The Health Effects?

Limited studies show that existing levels of dioxin in soils do not typically approach the levels needed to produce the health effects listed below.

If a person is exposed to enough dioxin, he or she may begin to show signs and symptoms of dioxin poisoning. In people, too much exposure to dioxin may cause:

- Chloracne, a severe acne-like condition on the skin
- Cancer (questionable for people)
- Injury to the liver
- Weakened immune system
- Miscarriage, lowered sperm count, and birth deformities
- Headache, nervousness, dementia, irritability, depression, anxiety, loss of sleep, loss of sex drive.

In animals, the known effects are:

- Reproductive effects
- Abnormal swelling in tissues
- Growth reduction
- Cancer
- Weakened immune system

Because many of the health effects described above can also be caused by other chemicals and certain natural diseases, it is difficult to link an illness to dioxin without a documented history of high exposure.

What Amounts are Harmful?

Considering that dioxin in small amounts is everywhere, in food, water, and soils, most people want to know what amounts might be harmful to them and their children. We expect to find existing amounts of dioxin in soils at around 10 parts per trillion. To

provide some understanding of what this number means, 10 parts per trillion could roughly be compared to about 10 seconds in 320 centuries.

Safe levels can be achieved with all chemicals, including dioxin. Yet, with natural sources and the industrialized nature of the American society, a zero amount of dioxin is not possible or realistic.

It takes at least 1,000 to 20,000 parts per trillion to have a risk that could be harmful and unacceptable to people, based on scientific and regulatory information.

EPA presently considers values above 1,000 parts per trillion in neighborhood soils to be an amount that needs further study or may need to be cleaned up.

EPA considers values above 5,000 to 20,000 parts per trillion in commercial soils to be an amount that needs further study or may need to be cleaned up.

EPA has these two risk amounts based on two different assumptions.

1. When looking at residential soils, we assume that in neighborhoods, children could be exposed longer at home all day for 350 days per year.
2. In commercial areas, we assume that workers are exposed for a shorter time only 8 hours a day for 5 days a week. This exposure would be much shorter than that of a child at home.

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