

DIOXINS AND FURANS

Introduction: There are over 200 different types of polychlorinated dibenzodioxins (PCDDs), or dioxins for short. Polychlorinated dibenzofurans (PCDFs) or furans for short are related chemicals. These compounds are persistent organic pollutants (POPs) for which more information is available in the POP factsheet in this series. There are other persistent organic pollutants that act like dioxins which are called "dioxin-like compounds." Perhaps the most well known dioxin is Agent Orange which was used extensively in the war in Vietnam and was tested at the Canadian Forces base in Gagetown, New Brunswick although it has now been banned for many years.



What they are used for: They are mainly by-products of industrial processes although volcanic eruptions and forest fires can also produce dioxins. Dioxins are produced due to the burning/ incineration of waste and from other combustion processes such as combustion of fuels (coal, wood).

Where are they found: Dioxins and furans contaminate bodies of water and the air we breathe. They accumulate in the body fat of animals making the predominant route of exposure the ingestion of foods with high-fat content. Because dioxins, dioxin-like compounds and furans are capable of attaching themselves to air-borne particles, they can

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travel great distances and accumulate in areas that do not have local emission sources. Dioxins and furans can also be found in cigarette smoke and have been formed as a byproduct in the manufacture of some herbicides and in bleached paper pulp.

Health Effects Summary: Dioxins and furans can promote autoimmunity, which is when the body's immune system attacks its own cells. Autoimmunity causes diseases like Type 1 diabetes where the body attacks the insulin producing cells. Dioxins have been linked to skin disorders, liver problems, immune and endocrine system problems, reproductive disorders, effects on nervous system development and certain cancers.

How we are exposed: Man-made dioxins and furans cycle and recycle endlessly in the environment. Because they have built up in our environment, the primary source of exposure to dioxins and dioxin-like compounds in people (or humans) is through food, especially meat, milk, dairy products, eggs, and fish. These foods make up to 93% of total exposure to dioxins, dioxin-like compounds and furans. Inhalation, drinking water, use of vegetable oils, and other routes of exposure only constitute a small percentage of overall exposure. However, it is the uncontrolled burning of municipal and medical waste that produces by far the most dioxins and furans in Canada.

What you can do to reduce exposure: You can avoid foods with high-fat content and large consumption of dairy products and fish. Trim off any visible fat when preparing foods. Most importantly, avoid burning of household waste/garbage as fumes produced by burning plastics contain dioxins that your body can easily absorb. Warn others in your community not to burn their household waste. Do not smoke indoors and reduce your exposure to first and second-hand smoke as much as possible.