



DIOXINS AND FURANS

The Issue

Dioxins and furans are toxic chlorinated chemicals that are found in very small amounts in the environment, including in the air, water, and soil. They are also present in some foods.

Large doses of dioxins and furans are known to cause serious health problems, including cancer, in laboratory animals. The impact of these substances on humans and wildlife, which are exposed to smaller doses, is less certain. As a result, the level of health risk from dioxins and furans is controversial.

Background

Dioxins and furans are the by-products of specific activities. The biggest source of dioxins and furans in Canada is the large-scale burning of municipal and medical waste. Other major sources include:

- the production of iron and steel
- backyard burning of household waste, especially plastics
- fuel burning, including diesel fuel and fuel for agricultural purposes and home heating
- wood burning, especially if the wood has been chemically treated
- electrical power generation

There are 210 different dioxins and furans. All dioxins have the same basic chemical "skeleton," and they all have chlorine atoms as part of their make-up. This is also the case with furans. These substances vary widely in toxicity. The one considered most toxic is referred to as 2,3,7,8- TCDD, or simply TCDD.

Dioxins and furans can travel long distances in the atmosphere, which means that Canadians may also be exposed to dioxins and furans created in other countries. These substances work their way up the food chain by dissolving and remaining stored in the body fat of animals. Because of this fact, people actually take more dioxins and furans into their bodies through food than through air, water or soil. Meat, milk products and fish have higher levels of dioxins and furans than fruit, vegetables and grains. Tobacco smoke is also a source of exposure.

These sources and processes result in widespread, low-level exposure of the general population to mixtures of dioxins and furans.

The Health Effects of Dioxins and Furans

Scientists have researched the effects of dioxins and furans on laboratory animals. While the impact varies from one type of animal to the next, the serious health effects that can occur include weight loss, skin disorders, liver problems, immune effects, impaired reproduction, birth defects and cancer.

In people exposed to high levels of dioxins and furans through job-related activities, or through chemical spills, the health effect seen most often is a skin condition called chloracne. There are also some reports of other effects on the skin, liver, thyroid, and on reproduction and the immune system. There are also reports of an increase in cancer.



While the evidence of these effects in humans is not conclusive, the findings generally support the results of animal studies. Scientists agree that exposure to dioxins and furans should be kept as low as possible.

Minimizing Your Risk

If you are concerned about exposure to dioxins and furans, consider taking the following steps:

- Do not burn garbage, especially construction materials that might contain wood preservatives or plastic.
- Limit the amount of wood you burn in your fireplace or stove, and learn about wood-burning techniques that release fewer dioxins.
- Enjoy a variety of foods. Vegetables, fruit and grains contain fewer dioxins and furans than meat, milk products and fish.
- Follow provincial/territorial government advisories about eating certain types of fish.
- Do not smoke, and keep your family away from second-hand smoke as much as possible.

By taking these steps, you can reduce your family's exposure to dioxins and furans, and help to limit the overall release of these substances into the environment.

Government of Canada's Role

The Government of Canada is working to eliminate measurable manufactured releases of these substances into the environment to help protect Canadians against harm from dioxins and furans.

Actions to date include:

- A ban on the use of pesticides with high levels of TCDD. The dioxin content in current pest control products is very low.
- Guidelines to minimize the release of dioxins and furans from municipal solid waste and hazardous waste incinerators.
- Regulations requiring the virtual elimination of dioxin and furan releases from pulp mills.
- Active support for international agreements to reduce releases of these substances on a global basis.

These efforts are working. The latest inventory shows a 60 percent decrease since 1990 in the overall release of dioxins and furans from sources within Canada. Also, the levels of dioxins and furans in breast milk, which were already low, went down by roughly 50 percent between the 1980s and the 1990s.

The Government's work to control sources of dioxins and furans in Canada continues. A federal-provincial task force has updated the inventory of sources for these substances, and Canada-wide standards are being established to address releases from remaining manufactured sources. In addition, the Government is continuing to carry out food monitoring and surveillance activities to identify and eliminate previously unknown sources of dioxin contamination.

Need More Info?

For more information, contact :
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or visit :

Health Canada's Toxics Management Web site at :
http://www.hc-sc.gc.ca/hecs-sesc/toxics_management/who_we_are.htm

Health Canada's Food Program Web site at :
http://www.hc-sc.gc.ca/food-aliment/dg/e_about_us.html

For tips on safe and healthy ways to burn wood, visit Burn it Smart
<http://www.burnitsmart.org/english/index.html>

See also :
Environment Canada at
http://www.ec.gc.ca/pops/brochure_e.htm

United States National Academy of Sciences Report, Dioxins and Dioxin-like Compounds in the Food Supply: Strategies to Decrease Exposure, at :
<http://www.nap.edu/books/0309089611/html/>

Additional It's Your Health articles can be found at :
www.healthcanada.ca/iyh
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