



Dioxins, Furans and Dioxin-Like Polychlorinated Biphenyls

Dioxins, furans, and dioxin-like polychlorinated biphenyls (PCBs) are the abbreviated names for a family of chemicals that have similar toxicity and shared chemical characteristics. The dioxins and furans are not manufactured or produced intentionally but are created when other chemicals or products are made. These chemicals may be created during burning of forests or household trash; chlorine bleaching of pulp and paper; or manufacturing or processing of certain types of chemicals, such as pesticides. Until banned in 1979, PCBs were manufactured as insulator fluids in heat-exchangers and transformers, as hydraulic fluids, and as additives to paints, oils, and caulks. All of these chemicals remain in the environment even though they are no longer manufactured. They enter the food chain and build up in larger animals.

How People Are Exposed to Dioxins, Furans, and Dioxin-Like PCBs

People can be exposed to these chemicals by eating high-fat foods such as milk products, eggs, meat, and some fish. Workplace exposures can occur in industries that burn waste matter or that manufacture other chemical products containing these substances.

How Dioxins, Furans, and Dioxin-Like PCBs Affect People's Health

Human health effects from low environmental exposures are unclear. People who have been unintentionally exposed to large amounts of these chemicals have developed a skin condition called chloracne, liver problems, and elevated blood lipids (fats). Laboratory animal studies have shown various effects, including cancer and reproductive problems.

Levels of Dioxins, Furans and Dioxin-Like PCBs in the U.S. Population

In the *Fourth National Report on Human Exposure to Environmental Chemicals (Fourth Report)*, CDC scientists measured 26 of these chemicals in the blood serum (the clear part of blood) of at least 1,800 participants aged 12 years and older who took part in the National Health and Nutrition Examination Survey (NHANES) during 2003–2004. Prior survey periods of 1999–2000 and 2001–2002 are also included in the *Fourth Report*. By measuring these chemicals in serum, scientists can estimate the amounts of these chemicals that have entered people's bodies.

- In the *Fourth Report*, CDC researchers found low levels of these 26 chemicals in the U.S. population.
- The findings are consistent with other studies that found that the levels of most of these chemicals have decreased by more than 80% since the 1980s.

Finding a measurable amount of one or more of these chemicals in serum does not mean that the level of one or more of these chemicals causes an adverse health effect. Biomonitoring studies of these chemicals provide physicians and public health officials with reference values so that they can determine whether people have been exposed to higher levels than are found in the general population. Biomonitoring data can also help scientists plan and conduct research on exposure and health effects.

For More Information

- Agency for Toxic Substances and Disease Registry (ATSDR)

ToxFAQs for Chlorinated Dibenzo-p-Dioxins

<http://www.atsdr.cdc.gov/tfacts104.html>

Public Health Statement for Chlorinated Dibenzo-p-Dioxins

<http://www.atsdr.cdc.gov/toxprofiles/phs104.html>

ToxFAQs for Chlorodibenzofurans

<http://www.atsdr.cdc.gov/tfacts32.html>

Public Health Statement for Chlorodibenzofurans

<http://www.atsdr.cdc.gov/toxprofiles/phs32.html>

- Environmental Protection Agency
Dioxins and Furans
<http://www.epa.gov/pbt/pubs/dioxins.htm>
- U.S. National Library of Medicine, National Institutes of Health
ToxTown–Dioxins
http://toxtown.nlm.nih.gov/text_version/chemicals.php?id=12

ToxTown–Polychlorinated Biphenyls

http://toxtown.nlm.nih.gov/text_version/chemicals.php?id=25

- Food and Drug Administration
Questions and Answers About Dioxins
<http://www.fda.gov/Food/FoodSafety/FoodContaminantsAdulteration/ChemicalContaminants/DioxinsPCBs/ucm077524.htm>

November 2009

The Centers for Disease Control and Prevention (CDC) protects people's health and safety by preventing and controlling diseases and injuries; enhances health decisions by providing credible information on critical health issues; and promotes healthy living through strong partnerships with local, national, and international organizations.