

Dioxins and our health



What are dioxins ?

Dioxins are a group of highly toxic chemical compounds that are called persistent organic pollutants (POPs). They are found throughout the world in the environment.

Dioxins mainly build up in the fatty tissue of animals, and the higher an animal is in the food chain, the higher the concentration of dioxins.

Of the known dioxin-related compounds, about 30 have significant toxicity. TCDD is the most toxic.



How are dioxins produced ?

Most dioxins are unwanted by-products of manufacturing processes such as smelting, the chlorine bleaching of paper pulp, and the production of some herbicides and pesticides. One of the major causes of the release of dioxins into the environment is incomplete burning of solid waste and hospital waste by

uncontrolled waste incinerators. Dioxins can also result from volcanic eruptions, forest fires and other natural processes. Technologies have been developed for controlled waste incineration with low dioxin emissions.



Where can we find dioxins ?

Long-term storage and improper disposal of PCB-based waste may cause the release of dioxins into the environment.

The highest levels of dioxins are found in soil, sediment and food—especially dairy products, meat, fish and shellfish. Very low levels are found in plants, water and air.



What should be done to reduce the production of dioxins ?

Proper incineration of contaminated material is currently the best method for preventing and controlling exposure to dioxins. It can also destroy PCB-based waste oils. The incineration process requires high temperatures above 850°C. Even higher temperatures of 1000°C or more are required to destroy large amounts of contaminated material.

The disposal of electrical equipment may also release PCBs and PCDF contaminants. To reduce human exposure, it is crucial to identify and safely dispose of material containing or likely to generate dioxins and dioxin-like substances such as electrical equipment.



What can we do to reduce the risk of exposure?

Experts have established a provisional tolerable monthly intake (PTMI) of 70 picograms per kilogram of body weight per month. Over a lifetime, this is the amount of dioxins that can be ingested without causing negative health effects.

Food and feed contamination monitoring systems can be used to make sure these tolerance levels are not exceeded. It is the responsibility of food and feed producers to guarantee the safety of raw materials and processes used during production, and it is the role of national governments to monitor the safety of their food supplies and to take action to protect public health.

A balanced diet that includes plenty of fruits, vegetables and cereals can help prevent too much exposure to dioxins from a single source. This is probably most important for girls and young women because it can reduce the exposure of their unborn babies and breastfed infants when they become mothers later on in life.



Dioxins in Asia

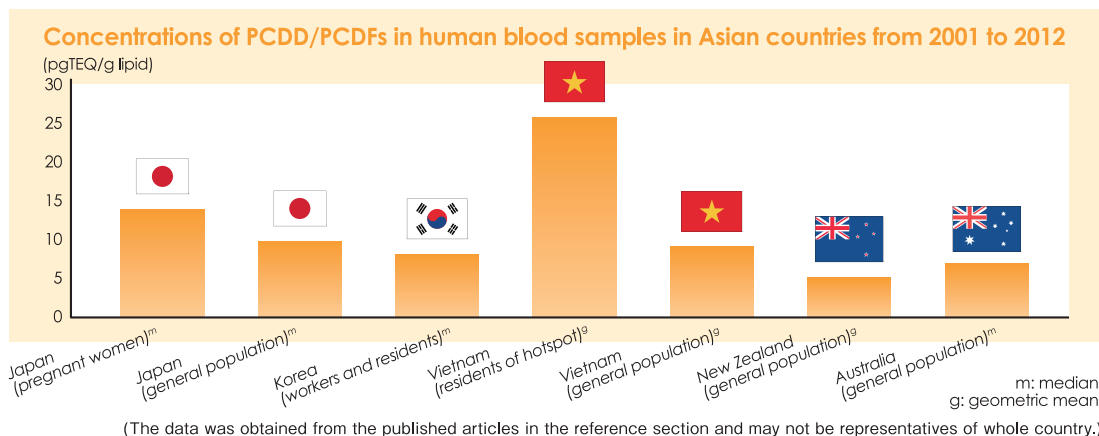
Concentrations in human blood

More than 90% of human exposure is through food—especially fish and shellfish, meat and dairy products.

Concentrations in human blood samples in Asian countries and Pacific Islands are

shown below. Residents living in hot spots where incidents occurred in the past continue to have higher levels of dioxins.

The general population among the countries shown was found to have similar dioxin levels.



In the past

During the Vietnam War from 1961 to 1972, herbicides contaminated with TCDD—the most toxic congener of dioxin—were sprayed in Southern Vietnam. Military airbases formerly used for storing herbicides are referred to as TCDD contamination hot spots because of the

extremely high levels of TCDD found in soil samples collected from them. Yusho and Yu-cheng are “oil diseases” caused by the consumption of contaminated rice oil in western Japan in 1968 and in Taiwan from 1978 to 1979.

Current issues

According to the Global E-waste Monitor, 40.7% of the world’s e-waste (i.e., electrical and electronic equipment and its parts that have been discarded by the owner as waste) is generated in Asian countries.

Uncontrolled combustion and thermal processing of e-waste can release complex mixtures of dioxin-related compounds. Informal e-waste recycling sites in developing Asian countries are severely contaminated by dioxin-related compounds. Residents living near such sites in Asia are thought to be exposed to dioxin-related compounds through the ingestion of soil/dust and contact with



the skin, as well as by eating food produced nearby. Comprehensive assessment of dioxin-related compounds from e-waste at informal recycling sites in Asian countries must be carried out to effectively determine human and environmental exposure risks.



What is known about health effects ?

Dioxins are highly toxic and can cause reproductive and developmental problems, damage the immune system, interfere with hormones and cause cancer.

Short-term exposure to high levels of dioxins may result in skin lesions, such as chloracne and patchy darkening of the skin, and altered liver function. Long-term exposure is linked to impairment of the immune system, the developing nervous system, the endocrine system and reproductive functions.

Prevention for the next generation

Developing fetuses are the most sensitive to dioxin exposure. Newborns, with their rapidly developing organ systems, may also be more vulnerable to some effects. Therefore, both accidental high-dose exposure and relatively low-level exposure have been linked to low birth weight, delays and defects in neurodevelopment, and endocrine disrupting properties. Although some fish may be contaminated, most are safe to eat. Pay attention to local fish advisories/guidance and improve methods used to clean and cook fish to remove some of the fat. It is also important to keep children away from waste dump sites, e-waste recycling sites and other contaminated areas.



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