



Toxics Link
for a toxics-free world

Dioxins & Furans



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Frequently Asked Questions

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1. What are dioxins and furans?

Dioxins and Furans are the toxic substances (chemicals), which have similar chemical structure. Generally dioxins and furans are not man-made or produced intentionally, but these are released into the environment unintentionally in gaseous and residues forms. Most of them are the by – products of industrial process. There are different types of dioxins and furans present in the environment. However, some of these are very toxics. Of all the dioxins and furans, 2, 3, 7, 8-tetrachloro-p-dibenzo-dioxin (2, 3, 7, 8 TCDD) is considered the most toxic.

Dioxins and furans are listed as persistent organic pollutants (POPs) in the Stockholm Convention. These were the PoPs, which were part of the original “dirty dozen“

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2. What are the sources of dioxins and furans?

The dioxins and furans are not manmade chemicals. These are formed as the byproduct of chemical process; these include manufacturing of chemicals, pesticides, steel and paints, pulp and paper bleaching, exhaust emission and incineration. They can also be formed during any other uncontrolled combustion process such as waste burnings and waste incinerators. The automobiles also contribute to the release of dioxins and furans into the environment. The other sources are production process of PCB(polychlorinated biphenyl).

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3. Why are dioxins and furans a cause of concern?

Dioxins and furans are proven carcinogen while known to cause a number of other health impacts in human as well as animals. People exposed to dioxins and furans have experienced changes in hormone levels and are suspected for disrupting endocrine systems. In general, toxic exposures to dioxins have been known to cause disorders of liver, thymus and spleen, endocrine disruption, skin lesions and in extreme cases death. Health effects can be observed for years after the initial exposure.

In case of poultry animals these chemicals can cause decrease in egg production and hatching. Further the animals also suffer weight loss and skin lesions.

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4. What are the exposure pathways of dioxins and furans?

What is the exposure pathway of dioxins and furans?

Dioxins and furans are persistent organic pollutants and they stay and build up in the fatty tissues of animals. Thus most of the exposure in human being is via fats in fish, meat, eggs, milk and dairy products. In 2005, International POPs elimination network (IPEN) conducted a study to determine dioxin levels in eggs. IPEN found high levels of dioxins and PCBs contamination in free-chicken eggs from 20 locations in 17 countries.

Levels of dioxins in animal fat may be related to contamination of the local environment and to contamination of feed or, to certain production process.

The uptake of dioxins by fish occurs via gills and diet. Fish accumulate dioxins in their fatty tissue and liver. Bottom dwelling/bottom feeding fish species are more exposed to contaminated sediments than pelagic fish species. Animal exposure to dioxin contaminates by feed may originate from many different sources.

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5. Dioxins and Women

Dioxin and furans are particularly worrisome for women who can accumulate it in their bodies for years and then pass it on to their children or nursing infants. These chemicals can pass through the placental barriers to fetus and also through breast milk to infants.



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6. Are dioxins and furans problem in India?

In a global study conducted by International PoPs Elimination Network (IPEN), dioxins were found in the eggs collected from two locations in India. Similarly in 2007, EU food safety experts issued an alert on high levels of dioxins in gum shipments from an India supplier. This has had an impact on guar gum exports, as India accounted for 80% of world trade in guar gum. There are also studies which relate dioxins source and cancer deaths in India.

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7. What are the sources of dioxins and furans in India?

There are defined sources of dioxin and furans release in India. Waste incineration, ferrous and non ferrous metal production, heat and power generation, production of mineral products, transportation, uncontrolled combustion processes, production and use of chemicals and consumer goods, waste disposal and landfills are the major sources of dioxins and furans release in India. There are also other sources like forest fires, crematoria and smoke house. All these contribute to the release of dioxins and furans in India.

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8. What are the estimates of dioxins and furans released in India?

In the years 2009-10, using the UNERP tool-kits, the annual total dioxins and furans release was estimated as 8656.55 g TEQ in India. Of the many sources the waste incineration and ferrous, non-ferrous metal production contribute significant amount of dioxin/furans release in India. The pattern of release of dioxins and furans are also varying across the country, with central region contributing maximum release followed by Southern, Northern and Eastern region.

Q 9. How can the dioxins and furans release can be mitigated/ reduced in India?

The dioxins and furans release can be mitigated or reduced in India by using best available technologies in various sectors, including promoting non burn technology, discouraging biomass burning, and source segregation of municipal waste. There is also a need for proper monitoring mechanism to implement the rules and regulations to control dioxin-furans emissions.



Q 10. Is there any standard for dioxins and furans in India?

In India, there are standards for various industries and incinerators on release of dioxins and furans into the environment. However, in India, there are no dioxins/ furans standards in food which is very important to check the chemicals entry into the food chain.

Q 11. How can I help to reduce or mitigate dioxins and furans in India?

A citizen can play an important role in reducing the dioxins and furans in India. There are many sources of dioxin release like open burning, waste burning and biomass burning where citizen's role is crucial to bring significant change. The general public also needs to be encouraged for source segregation and promote composting of household municipal wastes as far as possible that will minimize the waste burning. Schools can also play crucial role in educating students.

Q 12. Which agencies in India are working on these issues?

There are many important government agencies which are working on these issues. Apart from the Ministry of Environment and Forests Central Pollution Control Board, National Institute for Interdisciplinary Science and Technology (Trivandrum) and National Engineering Research Institute (Nagpur) several other government agencies are working on dioxin issues. The Government of India has submitted a National Implementation Plan to Stockholm Secretariat and has drawn a long-term action plan to mitigate and reduce dioxin release in India.

The civil societies are also playing an important role in the field of research and awareness generation on these issues. International PoPs Elimination network (IPEN) - an international group is also working on these issues in association with the environmental NGOs in India.

References:

1. www.toxiclink.org
2. www.ipen.org
3. www.pops.int
4. *National Implementation Plan : Stockholm Convention (Government of India)*
5. www.neeri.res.in

The Stockholm Convention

The Stockholm Convention is an international globally binding treaty that aims to eliminate or restrict the production, use, storage, trade and storage of Persistent Organic Pollutants (PoPs). The initiative was taken by the governing council of the United Nation Environmental Program (UNEP) in 1995 and the negotiations for the convention were completed on 23 May, 2001. Finally the convention came into the force on 17 May, 2004. India Ratifies the convention on 13th Jan 2006 and came into force on 12th April 2006.



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