

European Food Safety Authority (EFSA) proposes new health-based guidance value for dioxins and dioxin-like polychlorinated biphenyls

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The European Food Safety Authority (EFSA) has derived a new health-based guidance value for dioxins and dioxin-like polychlorinated biphenyls (dl-PCB). The tolerable weekly intake (TWI) for dioxins and dl-PCB has been lowered from 14 picograms (14×10^{-12} grams) to two picograms per kilogram body weight. The TWI value is the maximum intake of substances in food, such as nutrients or contaminants that can be consumed weekly over a lifetime without risking adverse health effects.

With its opinion, EFSA has established a comprehensive new scientific basis. The selection of the study to determine the critical endpoint for deriving a health-based guidance value still leaves questions unanswered according to the German Federal Institute for Risk Assessment (BfR). EFSA itself points out in its communication that the toxicity of the dioxin-like PCBs with the highest hazard potential (PCB 126) is possibly overestimated.

EFSA invited risk assessment authorities to participate in a scientific exchange on 13 November 2018. EFSA is planning to publish the results of this expert discussion.

From a health point of view, dioxins and dioxin-like PCBs are undesired substances. PCBs occur everywhere in the environment and a transfer into the food chain cannot be avoided. An acute health risk through the uptake of dioxins and dioxin-like PCBs via food can be practically excluded. The question as to whether health impairments can occur with intake over a longer period involves numerous scientific uncertainties. However, it is generally accepted that there has been a significant reduction in the contamination of humans in Germany with dioxins and dioxin-like PCBs over the last 30 years.

The BfR welcomes the EFSA proposal to intensify research activities on dioxins and dioxin-like PCBs in order to further optimise the assessment. Further knowledge of the mode of action of the substances is required, for example. The database should also be extended by appropriate investigations. The BfR will continue to conduct intensive scientific research on dioxins and dioxin-like PCBs.

Dioxins and PCBs are chlorine-containing hydrocarbons with a similar structure. Dioxins occur under certain conditions during combustion processes, whereas PCBs were manufactured for various applications, such as plastics, plasticisers and hydraulic fluids. Production of PCBs was discontinued in the 1980s but due to their persistence they are still to be found in the environment. The substance group of dioxins as well as that of PCBs comprise substances with potential to cause adverse health effects. However, management measures led to a significant reduction in contamination over the last 30 years

<https://link.springer.com/article/10.1007/s00103-018-2764-5>

Dioxins and PCBs: main source is foods of animal origin

As dioxins and PCBs occur everywhere in the environment, their transfer to the food chain cannot be avoided. The substances accumulate in the fatty tissue of animals and are taken up by humans through the consumption of foods of animal origin, such as meat, fish, eggs, milk and dairy produce. Infants ingest dioxins and PCBs primarily through breast milk.

The new health-based guidance value is seven times lower

In 2001, the *Scientific Committee on Food* of the Commission of the European Union, which was responsible at the time, derived a tolerable weekly intake of 14 picograms per kilogram body weight (pg/kg bw) as health-based guidance value for dioxins and dioxin-like PCBs. Part of EFSA's remit since its foundation is to establish health-based guidance values for undesired substances in food. The body which is now responsible, EFSA's *Panel on Contaminants in the Food Chain* (CONTAM), has reassessed the health risk posed by dioxins and dl-PCBs.

The new TWI of 2 pg per kg bw is seven times lower than the old value. It is based essentially on a study conducted on young men, in which the possible influence of dioxins and dl-PCBs on sperm quality and sperm count was examined. The re-assessment was published as an EFSA Opinion ("*Risk for animal and human health related to the presence of dioxins and dioxin-like PCBs in feed and food*"): <http://www.efsa.europa.eu/en/efsajournal/pub/5333>) on 20 November 2018.

The CONTAM panel estimated the weekly intake of dioxins and dioxin-like PCBs for various age groups on the basis of the consumption data in Europe and levels of these substances measured in food. The panel concludes that the new TWI is sometimes quite considerably exceeded in all age groups.

Generally, dioxins and dioxin-like PCBs are undesired substances: They occur everywhere in the environment and transfer into the food chain cannot be avoided. An acute health risk through the uptake of dioxins and dioxin-like PCB via food can be practically excluded. The question as to whether health impairments can occur with intake over a longer period involves numerous scientific uncertainties. However, it is generally accepted that there has been a significant reduction in the contamination of humans in Germany with dioxins and dioxin-like PCBs over the last 30 years.

The BfR will continue to conduct intensive scientific research on dioxins and dioxin-like PCBs.

More information on the subject of dioxins at the BfR website:

https://www.bfr.bund.de/en/a-z_index/dioxin-129893.html

Frequently asked questions about dioxin and dioxin-like PCB:

https://www.bfr.bund.de/en/questions_and_answers_on_dioxins_and_pcb_in_food-69876.html

More information on the subject of dioxins in breast milk in the Federal Health Gazette:

Foreign substances and pathogens in breast milk. A risk for the child?

Padberg, S., Bühner, C., Menzel, J. et al. Federal Health Gazette (2018) 61: 960.

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The German Federal Institute for Risk Assessment (BfR) is a scientifically independent institution within the portfolio of the Federal Ministry of Food and Agriculture (BMEL) in Germany. It advises the Federal Government and Federal Laender on questions of food, chemical and product safety. The BfR conducts its own research on topics that are closely linked to its assessment tasks.

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