

FAQ

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Methylmercury: Why pregnant and breastfeeding women should avoid certain types of fish

Methylmercury (MeHg) is an organometallic compound formed naturally by certain bacteria from inorganic mercury compounds and accumulates primarily in fish and seafood via the marine food chain. When these foods are consumed, it also enters the human body.

Methylmercury can, among other things, disrupt neurological development. Consequently, unborn children and infants are particularly vulnerable to health effects caused by the intake of methylmercury. In particular, pregnant and breastfeeding women should therefore avoid eating types of fish that contain high levels of methylmercury.

For most people, who eat fish and seafood as part of a typical diet, health effects caused by methylmercury are not expected. On the contrary, these foods are a valuable source of, for example, vitamins, minerals, proteins and polyunsaturated fatty acids. According to studies, regular consumption of fish is associated with a reduced risk of various diseases, such as cardiovascular disease. However, the health-based guidance value may be exceeded by people who frequently consume fish, particularly fish species with high levels of methylmercury.

What is methylmercury?

Inorganic mercury is widespread in nature. It is released, for example, during volcanic eruptions, forest fires or the burning of coal. Bacteria found in the oceans and inland waters absorb the metal from their environment and convert it into methylmercury. In this form, the mercury is also easily absorbed by other living organisms. It accumulates particularly in marine animals and the marine food chain. At each stage of the food chain – from phytoplankton through zooplankton to fish, marine mammals or birds – the methylmercury content in the respective organism increases. When fish and seafood are consumed, methylmercury also enters the human body.

How do consumers ingest methylmercury and what happens to it in the body?

Methylmercury enters the human body primarily through the consumption of fish and seafood and is readily absorbed into the blood via the gut. Once absorbed, it is distributed throughout the body, with the highest concentrations being found in the liver, kidneys and brain. Methylmercury has also been detected in human cord blood, the placenta and breast milk.

During human metabolism, methylmercury is partially converted into inorganic mercury. Following exposure to methylmercury, therefore, both methylmercury and inorganic mercury are present in tissues and excretions. Methylmercury has an approximate half-life of 80 days for excretion from the human body. It is mainly excreted via faeces, urine and hair.

What are the main health effects associated with the intake of methylmercury?

Following ingestion, methylmercury is distributed throughout the body via the bloodstream from the gastrointestinal tract. Numerous epidemiological studies have shown that the developing nervous system is particularly sensitive to the effects of methylmercury. It is therefore assumed that unborn children and infants are particularly vulnerable to health impairments caused by the ingestion of methylmercury.

Prolonged high exposure to methylmercury can cause nerve damage, resulting, for example, in impaired motor function, sensory perception and muscle weakness. However, such levels of methylmercury are not usually ingested through food.

How much methylmercury can I consume without putting my health at risk?

The European Food Safety Authority (EFSA) has established a tolerable weekly intake (TWI) for methylmercury of 1.3 micrograms (μg) of methylmercury per kilogram of body weight per week. The TWI specifies the quantity of a substance that can be consumed orally on a weekly basis over an entire lifetime without an appreciable health risk. The TWI is used to assess the health risk associated with chronic exposure.

Why should pregnant and breastfeeding women in particular minimise their intake of methylmercury?

After being absorbed through the gastrointestinal tract, methylmercury is distributed throughout the body via the bloodstream. In pregnant women, it passes through the placenta into the developing child's body. In breastfeeding women, it can also be excreted into breast milk. As methylmercury is neurotoxic and can impair the development of the nervous system, the BfR also recommends that especially pregnant and breastfeeding women should limit their intake of methylmercury. Further information can be found in the statements ["Fish consumption during pregnancy and breastfeeding: Some fish species have high levels of methylmercury"](#) and ["Methylmercury in fish and seafood – health assessment of new data from the BfR-MEAL study"](#), as well as in the [consumer advice for pregnant and breastfeeding women](#).

How much methylmercury do consumers ingest?

People mainly ingest methylmercury by eating fish. Therefore, the amount ingested depends on how often fish is eaten and how much methylmercury it contains.

For the population in Germany, intake was assessed based on concentration data from the BfR-MEAL study. Specifically, methylmercury concentrations were measured in ready-to-eat fish and seafood, such as salmon or fish fingers. The concentration data was then linked to information on the consumption of these products, i.e. how often and how much fish and seafood or products made from them are eaten. This provides exposure estimates for the general population across all age groups. These estimates can then be incorporated into the health assessment of methylmercury intake.

In the BfR-MEAL study, the highest levels of methylmercury were found in smoked tuna, spiny dogfish and redfish. Although Alaska pollock had lower levels of this undesirable substance, it contributes most to methylmercury intake in the population because it is consumed in such large quantities. It is frequently found in fish fingers and many other frozen fish meals. The analysis showed that the average intake of methylmercury across all age groups is below the health-based guidance value of 1.3 µg per kilogram of body weight per week. At exposure levels below this value, no adverse health effects are expected.

The highest weekly intake of methylmercury was found among adolescents and young adults aged between 14 and 25. As for all other age groups considered, the average methylmercury intake for this group is also below the health-based guidance value. However, the weekly intake of methylmercury for the high-exposed consumers (95th percentile) in this age group is at or above the health-based guidance value. Within this age group, especially people who eat tuna consume high levels of methylmercury.

Which fish contain particularly high levels of methylmercury?

People are mainly exposed to methylmercury through the consumption of fish. The amount of this undesirable substance found in fish depends on various factors including the species, size and age of the fish. Generally, the highest levels of methylmercury are found in large and older predatory fish that are high up in the food chain, such as sharks and tuna.

Are there maximum levels for methylmercury in food?

In the European Union, maximum levels for mercury in food have been set ([Regulation \(EU\) No 2023/915](#)). In fish and seafood, mercury is found almost exclusively in the form of methylmercury. Depending on the species of fish, the maximum levels range from 0.3 to 1 milligram per kilogram of fresh fish weight. Compliance with these maximum levels is monitored by the official food control authorities of the federal states.

Should I avoid eating fish to prevent the intake of methylmercury?

When considering fish consumption and health, it is important to note that fish and seafood are a valuable source of important nutrients. These include vitamins and trace elements, proteins, long-chain omega-3 fatty acids such as eicosapentaenoic acid (EPA), docosapentaenoic acid (DPA) and docosahexaenoic acid (DHA), as well as vitamin D, iodine,

selenium and vitamin B12. Studies indicate that regular fish consumption reduces the risk of cardiovascular disease and lipid metabolism disorders. These health benefits should be taken into account when considering reducing fish consumption and thus lowering methylmercury intake.

Various scientific studies have attempted to weigh up the benefits and risks of fish consumption. In 2015, for example, the European Food Safety Authority (EFSA) concluded that limiting the consumption of fish species with high methylmercury levels was the most effective way to achieve the health benefits of fish whilst minimising the risks posed by excessive exposure to methylmercury. This applies in particular to infants, children and women of childbearing age. Accordingly, the German Nutrition Society (DGE) recommends consuming 1 to 2 fish meals per week (in German only) due to the health benefits. However, pregnant and breastfeeding women in particular should avoid certain fish species with high levels of methylmercury.

The BfR also recommends that pregnant and breastfeeding women limit their consumption of fish with high levels of methylmercury, such as shark, swordfish, halibut or tuna. The recommendation can be found in the Federal Ministry's consumer advice on health and food safety.

Further information on Methylmercury on the BfR website

Fish consumption during pregnancy and breastfeeding: Some fish species have high levels of methylmercury

<https://www.bfr.bund.de/en/opinions/fish-consumption-during-pregnancy-and-breastfeeding-some-fish-species-have-high-levels-of-methylmercury/>

Methylmercury in fish and seafood – health risk assessment of new data from the BfR MEAL study

<https://www.bfr.bund.de/en/opinions/methylmercury-in-fish-and-seafood-health-risk-assessment-of-new-data-from-the-bfr-meal-study/>

Consumer tip for pregnant and breastfeeding women to restrict their consumption of tuna fish is still valid

<https://www.bfr.bund.de/en/opinions/consumer-tip-for-pregnant-and-breastfeeding-women-to-restrict-their-consumption-of-tuna-fish-is-still-valid/>

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