



Mercury in Fish

FREQUENTLY ASKED QUESTIONS (FAQS)

Q. I heard there is mercury in the water and fish/shellfish. Where does the mercury come from?

A. Mercury is released into the environment from natural processes like weathering of mercury-bearing rocks and from volcanic eruptions. It is also released by man's activities such as incineration of wastes, coal burning, mining and smelting. There are hundreds of other sources ranging from batteries and thermometers to drilling mud and municipal waste water. Most mercury in water and fish is thought to come from atmospheric deposition. After deposition, mercury may be converted by biological processes into methylmercury. Methylmercury is readily taken up by living organisms and is passed along from microscopic plants and animals to larger organisms.

Q. Is it safe to swim in the water?

A. Yes. The concentration of mercury in most surface waters is extremely low – usually less than 5 parts per trillion. One part per trillion is the same as one drop of detergent in enough dish water to fill a string of railroad cars 10 miles long. The safety standard for drinking water is 2 parts per billion which means that most swimming water would have less mercury than the maximum amount allowed for drinking water. Furthermore mercury is not readily absorbed through the skin.

Q. If the amount (concentration) of mercury in water is so low, how does it get into fish?

A. Some of the mercury in water or in the water bottom is converted to methylmercury by bacteria and natural chemical processes. Bacteria are eaten by small organisms, which are eaten by larger organisms, which in turn are eaten by even larger organisms. At each step, the concentration of methylmercury increases (a large, predator fish eats a lot of smaller fish each of which has a relatively low concentration of methylmercury but each contributes to the total amount in the large fish). The concentration of methylmercury in a large predator fish may be 10,000 to 100,000 times greater than in the surrounding water.

Q. Are there methods of preparation that will reduce the methylmercury in fish?

A. No. Methylmercury is found throughout the muscle tissue and there are no specific areas of the edible flesh that have more or less mercury. Similarly, there is no known marinade or “soak” that would reduce mercury.

Q. Is it safe to eat fish?

A. Fish and shellfish are food sources that are high in protein and low in saturated fats and are direct sources of beneficial fatty acids. There are hundreds of studies that have demonstrated the health benefits of eating fish and shellfish. The concentration of methylmercury in some fish is considered unsafe (depending on the amount consumed) by the FDA and EPA. See Table 1. The level of consumption considered safe is a very conservative standard in order to protect those most at risk (primarily unborn and young children).

Q. What about mercury and heart disease?

A. Again, there are numerous studies that associate eating fish with a healthy heart. However, some recent studies have found an association between heart disease and eating fish with high methylmercury concentrations. This issue is not well studied and the general advice is to avoid fish with high mercury levels.

Q. Are some fish or shellfish lower in methylmercury?

A. Yes. The amount of mercury in fish and shellfish is dependent on the age of the fish, what it eats and in some cases where it lives. Older fish that prey on large amounts of other fish tend to have higher levels of mercury. Short-lived fish that feed lower on the food chain tend to have less mercury. Shellfish like shrimp, oysters and crabs tend to be low in mercury. Younger (and usually smaller fish) of most species are lower in mercury.

More information is needed on the mercury levels for many kinds of fish and for different ages of the same kinds of fish.

Q. What are the consequences of eating fish with elevated methylmercury levels?

A. Mercury is a heavy metal that affects the human nervous system. Most studies to date have concentrated on the effects of mercury on children born to mothers who ate large amounts fish or whale meat during pregnancy. Some of these children scored slightly lower on standard tests and showed delayed development. There is little information on the consequences of eating moderate amounts of fish with mercury levels commonly found in Gulf waters for adults. Clear evidence of nervous system impairment was obtained in a case where large quantities of fish with very high mercury concentrations were consumed in Japan.

Q. I'm pregnant (or trying). Should I eat fish?

A. The FDA advises against eating shark, swordfish, king mackerel and tilefish. The FDA further notes that "seafood can be an important part of a balanced diet for pregnant women and those of childbearing age who may become pregnant". FDA advises that these women can safely eat 12 ounces per week of shellfish, smaller ocean fish or farm raised fish. The EPA advises to check state consumption advisories (contact numbers and web sites at bottom) and to follow the limits in table 1.

Q. Are high levels of methylmercury in fish particular to the coastal areas of the Gulf of Mexico?

A. No. Elevated mercury levels in some fish have been known from various locations around the US for over 20 years. Currently there are 2,242 consumption advisories, primarily in specific fresh-water bodies, from 42 states. Most coastal states from Texas to New Hampshire have consumption advisories for fish like large mackerel. There is nothing unusual about local fish or levels of mercury in the Gulf of Mexico compared to other locations around the US.

Table 1.

EPA recommended monthly fish consumption limits for various levels of methylmercury in fish. Consumption limits have been calculated as the number of allowable fish meals per month based on the ranges of methyl mercury in the fish tissue. The following assumptions were used to calculate the consumption limits:

1. Consumer adult body weight of 154 lbs
2. Average fish meal size of 8-oz
3. Time-averaging period of 1 month
4. EPA's reference dose

Risk-based consumption limits	Ranges of methylmercury concentrations
Fish meals per month	Fish tissue concentration in parts per million
16	>0.03-0.06
12	>0.06-0.08
8	>0.08-0.12
4	>0.12-0.24
3	>0.24-0.32
2	>0.32-0.48
1	>0.48-0.97
0.5	>0.97-1.9
None	>1.9

Examples:

1. If a fish has a methylmercury level of 0.4 parts per million, then two 8 ounce (uncooked weight) meals per month can be safely consumed.
2. King mackerel over 39 inches in length often have mercury levels greater than (>) 1.9 parts per million methylmercury and no consumption is advised.

Gulf of Mexico contacts for fish consumption advisories

State	Phone No.	Web Site
Alabama	(334) 206-5973	http://www.adph.org/risk/
Florida	(850) 245-4299	www.floridaconservation.org/fishing/health.html http://www.marinefisheries.org/Pubs/mercury.htm
Louisiana	(888) 293-7020 (225) 765-0246	www.deq.state.la.us/surveillance/mercury/fishadvi.htm
Mississippi	(888) 786-0661 (601) 961-5171	www.deq.state.ms.us/newweb/homepages.nsf
Texas	(512) 719-0215	www.tdh.state.tx.us/bfds/ssd/fiscount.html

Note: If web address doesn't work try a search using your "state name" and "mercury" or your "state name" and "fish advisory".

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