



**FREQUENTLY  
ASKED  
QUESTIONS  
REGARDING  
FISH  
&  
METHYL  
MERCURY**

# **MERCURY...**

## **In The Environment & Our Food**

### ***How safe is it?***

Fish are an important part of a balanced diet, provide a good source of high quality protein and other nutrients, and are low in saturated fat. Recently concerns regarding the safety of eating fish have been expressed in regard to unacceptable levels of methyl mercury.

The consumer has to become educated and not discontinue eating fish altogether. To help gain a broader understanding of seafood safety and avoid unnecessary concern, this publication answers questions often asked concerning the safety of eating fish.

#### **Q. What is mercury?**

**A.** Mercury is a natural element and the only common metal that is liquid at room temperatures. It is rarely found free in nature. The major source of mercury is cinnabar, a sulfur containing ore. The metal form of mercury is obtained by heating cinnabar in a current of air and by condensing the vapor.

#### **Q. How does methyl mercury enter our food?**

**A.** Mercury is a volatile element and is released into the atmosphere naturally and through the burning of fossil fuels and industrial and household wastes. It finds its way into the food chain when mercury in the air is deposited by rain and snow into rivers and lakes. Mercury in seawater occurs mostly from atmospheric deposition and natural processes, including underwater volcanoes. Once in the water, air-borne mercury is transformed by bacteria into methyl mercury (MeHg). Aquatic organisms accumulate methyl mercury by absorbing it across their gills from the water and ingesting it through their diet.

#### **Q. Besides eating fish, what other ways are humans exposed to mercury?**

**A.** Mercury easily forms alloys with other metals and is widely used in thermometers, barometers, diffusion pumps and many other instruments. At one time, mercury was used in dental fillings (known as dental amalgams) and occasionally is still used in medicine, as mercurous chloride ( $Hg_2Cl_2$ , calomel). Because mercury is a volatile element and is readily absorbed through the respiratory tract, gastrointestinal tract or through unbroken skin, it is important that mercury be handled with care.

#### **Q. Do fish contain methyl mercury?**

**A.** Yes. Nearly all fish, both marine and freshwater, contain some methyl mercury. Large predatory species such as shark, swordfish, king mackerel, tilefish, bowfin, chain pickerel, and largemouth bass contain the most methyl mercury by ingesting it when eating other species of fish. In general, the larger and older a predatory fish is, the more methyl mercury it will

*Consumers have to be smart and stay abreast of the most accurate and dependable information regarding food safety.*

contain. This is due to the fact that methyl mercury is excreted slowly by living organisms and therefore accumulates over time.

**Q. How much methyl mercury is found in fish?**

**A.** Levels of methyl mercury vary greatly, largely based upon the species, size and age of the fish and the body of water in which they reside. According to the US Food & Drug Administration and Environmental Protection Agency, in general, methyl mercury levels for most fish range from less than 0.01 parts per million (ppm) to 0.5 ppm. The average concentration for commercially important species is less than 0.3 ppm. In a few species, methyl mercury levels can reach 1 ppm, which is the limit allowed by the FDA in fish intended for human consumption.

**Q. What health effects are associated with methyl mercury consumption?**

**A.** Excess exposure to methyl mercury can result in adverse health effects. The most severe effects have been seen following high-dose mercury poisoning situations and not from average fish consumption. The FDA and EPA recently issued a joint consumer advisory for pregnant women, women who may become pregnant, and children about the risks of mercury in fish. For marine fish in North Carolina shark, swordfish, king mackerel and tilefish may contain levels of methyl mercury at or slightly above 1 ppm and should not be eaten. For freshwater fish in NC, bowfin, chain pickerel, and largemouth bass south and east of Interstate 85 may contain high levels of methyl mercury and should be avoided. Exposure to high levels of methyl mercury may harm an unborn child's developing nervous system. The FDA recommends that nursing mothers and young children should avoid eating these fish.

**Q. Why does the USFDA & EPA recommend a limit for methyl mercury consumption?**

**A.** The FDA is charged with protecting the health of American consumers from contaminants in commercially caught and sold seafood. The EPA is charged with protecting the health of American consumers from contaminants in non-commercially caught fish and wildlife. As such, the two agencies have set consumption advisories at the 1 ppm level, which is the limit allowed by the FDA for fish intended for human consumption. The action level is purposely set 10 times lower than the lowest level associated with health problems (specifically mercury poisoning). This conservative level allows for the greater



protection of the public's health including adults, children and even unborn babies.

**Q. Are people at risk of exposure to methyl mercury poisoning from eating fish?**

**A.** No. Only a very small number of people who eat exceedingly large quantities of contaminated fish (shark, swordfish, king mackerel, tilefish, bowfin, chain pickerel, largemouth bass) need to be made aware of health concerns. The FDA says that: "Consumption advice is unnecessary for the top 10 seafood species, making up about 80% of the seafood market including canned tuna, shrimp, pollock, salmon, cod, catfish, clams, flatfish, crabs and scallops." The methyl mercury levels in these species all average less than 0.2 ppm.

**Q. Are people who eat extraordinarily large quantities of fish at risk?**

**A.** Pregnant women who frequently (more than once a week) eat affected species of fish (swordfish, shark, king mackerel, tilefish) may put their unborn children at risk. This is because the developing nervous system of a fetus is especially susceptible to effects of high methyl mercury.

**Q. What precautions should women take to reduce these risks?**

**A.** The FDA recommends that pregnant women, women who may become pregnant, and children should not eat shark, swordfish, king mackerel and tilefish. The FDA rejected calls to put canned tuna on the 'do not eat' list as levels of mercury in tuna are far lower than in larger predatory fish. This is particularly important immediately before conceiving and during the first trimester, because this early time of development is the most critical period of exposure for the fetus. Nursing women can follow the guidelines for average consumers. Of course, all consumers and especially pregnant women should follow the basic nutritional guidelines.

**Q. How can people ensure that their diets are safe?**

**A.** All consumers should eat a variety of fish species because mercury levels are low in most of the popular commercial species. Based on a weighted average, the level of methyl mercury for the top ten most-consumed seafood species is about 0.12 ppm. Mercury levels in canned tuna are also low (avg. 0.17 ppm) when compared with the average levels of species that the FDA says to avoid, which are around 1.0 ppm.



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# NORTH CAROLINA STATE UNIVERSITY

## CAMPUS

Department of Food Science  
Box 7624 Schaub Hall  
Raleigh, NC 27695  
Phone: 919.515.2956  
Fax 919.515.7124  
[www.cals.ncsu.edu/  
food\\_science/](http://www.cals.ncsu.edu/food_science/)

## COASTAL

Seafood Laboratory  
Center for Marine Sciences &  
Technology  
303 College Circle  
Morehead City, NC 28557  
Phone 252.222.6334  
Fax: 252.222.6335  
[www.cals.ncsu.edu/  
food\\_science/sflab/](http://www.cals.ncsu.edu/food_science/sflab/)

**ACHIEVE!**



## Q. Should people eliminate fish from their diets because of methyl mercury?

**A.** No. Eliminating an entire type of food or food group from the diet is generally unwise from a nutritional standpoint. Fish is an excellent source of lean protein, vitamins and minerals for adults and children. In 2001, the FDA advised pregnant women to select a variety of other seafood, including shellfish, canned fish, smaller ocean fish and farm-raised fish. The FDA states that they can safely eat 12 ounces of cooked fish per week. In addition, research has shown that omega-3 fatty acids found in certain fish help lower the risk of heart disease and ease the pain of arthritis. Recent studies indicate that the omega-3 fatty acids play a role in preventing pre-term delivery, easing post-partum depression and even have positive effects on infant sleep. So, women of child-bearing age should continue to eat fish following the FDA's advice.

## Q. What do health organizations say about the benefits of eating fish?

**A.** The American Dietetic Association (ADA) recommends eating 2-3 fish meals per week, and points to fish as a low-fat source of protein that may help lower cholesterol. In addition, the association says that research shows a number of benefits from consuming omega-3 fatty acids found mainly in fatty, cold water fish such as tuna, salmon, sardines, and mackerel. According to the ADA, omega-3 fatty acids help make blood cells less sticky, so it flows through blood vessels more easily and is less likely to form clots which can contribute to heart attacks and strokes.

The year 2000 revision of the American Heart Association (AHA) Dietary Guidelines now includes a recommendation that people eat fish (including canned tuna) for heart health benefits. "At least two servings of fish per week are recommended to confer cardio protective effects," says the AHA. The guidelines also mention the beneficial effects of omega-3 fatty acids in fresh and canned tuna and salmon on other diseases such as inflammatory and auto-immune diseases.



Omega-3 fatty acids found in these seafood products are essential nutrients from fetal development during pregnancy through adulthood. They are essential in brain and vascular development of infants and newborns and may provide beneficial effects on the cardiovascular system in adults who consume higher amounts of omega-3 fatty acids.

### Reference:

Asian Food Information Center. (n.d.). *Questions and answers about mercury in the environment and food.* Retrieved September 15, 2003 <http://www.afic.org>

For additional information on mercury and fish:

The Food & Drug Administration — [www.fda.gov](http://www.fda.gov)

The Environmental Protection Agency — [www.epa.gov](http://www.epa.gov)

North Carolina Department of Health & Human Services — [www.epi.state.nc.us/epi/fish](http://www.epi.state.nc.us/epi/fish)

