

THE CULINARIAN

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We the People of
the United States,
in Order to form
a more perfect Union,
establish Justice,
insure domestic
Tranquility,
provide for the
common defence,
promote the
general Welfare,
and secure the
Blessings of Liberty
to ourselves
and our Posterity,
do ordain and
establish this
Constitution for the
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*From the Golden Gate to the Eastern Shore,
we set the trend on how America eats.*

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Mercury in Seafood

The following has been supplied to us by Pamela Tom, California Sea Grant Marine Advisor, University of California, Food Science and Technology Department, Davis, California, 95616.

Mercury

Mercury is a naturally occurring metallic substance. Minute quantities of mercury are in air, water, soil, and all living matter. Mercury exists as both inorganic and organic forms, and the organic methyl mercury is the most toxic to humans. Mercury vaporizes into the air from natural soil deposits. Rain washes mercury out of the air and returns it to rivers, lakes, oceans, and the soil. This cycle of vaporization and washing-out has probably taken place since the earth formed. Because plants and animals evolved in the earth's environment, all contain trace quantities of mercury.

Mercury and the Environment

Plants absorb mercury from the soil and air during normal growth. In some cases, plants concentrate mercury to small metal droplets. Some bacteria convert inorganic mercury to organic mercury compounds. Fish and animals may consume mercury containing bacteria. Some animals and vegetables convert organic mercury back to inorganic compounds.

This constant cycling of mercury from one form to another has gone on for eons without any recognizable toxic effect on the world's food supply. Our use of mercury has probably not significantly increased the mercury concentration in the oceans.



Awareness of Potential Dangerous Effects Increasing

Until the 1950's, we were only vaguely aware of the problems resulting from mercury misuse. Isolated events tragically demonstrated the potential dangers.

In 1953, an epidemic hit fishermen and their families in villages on Japan's Minamata Bay. A number of people who were highly dependent on seafood showed signs of brain damage. Some of these cases were fatal. An investigation revealed that a local chemical plant was discharging organic mercury into the bay. The fish in the area absorbed the mercury and eventually passed it on to the villagers.

Authorities eliminated the source of pollution after finding the cause of the problem. Mercury in the bay returned to normal levels, and once again the local fish were safe to eat.

Guidelines Established For Mercury in Food

The US Food and Drug Administration (FDA) routinely analyzes foods for mercury. Almost all foods have mercury levels within the norms for natural environmental mercury content. Only some fish and fishery products have levels greater than considered normal.

In 1969, FDA set a 0.5-part-per-million (ppm) action level as the maximum safe limit for total mercury in fish. Action levels represent the limit at or above which FDA will take legal action to remove a product from the market. FDA based this level on their investigations, and on Japanese and Swedish mercury poisoning experiences.

In 1979, FDA raised the mercury action level to 1 ppm. FDA based this change in the action level in part on a National Marine Fisheries Service

study. The study showed that a 1 ppm action level would adequately protect consumers.

In 1984, FDA switched from enforcing the mercury action level based on total mercury to a methyl mercury basis. The change occurred for two reasons. An acceptable test for methyl mercury was available, and evidence indicated that methyl mercury was a small part of the total mercury in some fish.

Only Some Fish Exceed Limits

King mackerel, shark, swordfish, and tilefish are the four fish FDA found may have mercury levels above 1 part per million (ppm). These species accumulate mercury as they grow larger because they consume large amounts of small fish. All four combined add up to a very small amount (about 1%) of the fish Americans eat. The average mercury level in the types of fish Americans eat is low – 0.086 ppm, weighted for consumption.

Commercial fishermen capture large fish at sea, far from any source of industrial pollution. The mercury in their system must come from natural sources. For years, we have probably eaten some fish with mercury levels above FDA's limit without harmful effects. Analysis of museum specimens of tuna caught from 1879 to 1909 reveal that they contain similar levels of mercury as those in fish being caught today.

Scientists therefore conclude that mercury levels in ocean fish have not changed in the past 100 years.

Why We Have Not Suffered From Eating Fish

Researchers found that some fish, including tuna, can block and reduce the toxicity of mercury in their tissues. This research may explain how we have safely eaten fish containing levels of mercury higher than allowed by FDA. Most experts agree that the 1 ppm action level for methyl mercury in

New Dietary Guideline Recommendations on Seafood Consumption

The Dietary Guidelines Advisory Committee (DGAC) released updated seafood consumption recommendations in a report on June 15, 2010. The DGAC notes that eating at least 12 ounces per week of seafood can be safe to the general population if consumers choose the right mix of seafood i.e., selecting species that are low in contaminants such as methylmercury and persistent organic pollutants (POP). The 2004 FDA/EPA seafood advisory for women who may become or who are pregnant, nursing mothers, and children ages 12 and younger can safely eat up to 12 ounces of seafood, should limit eating white (albacore) tuna to 6 ounces per week, and should not eat large, predatory fish (such as, shark, tilefish, king mackerel and swordfish) while following Federal and local advisories. Among these vulnerable groups, scientific studies show that eating seafood beyond 12 ounces per week may be safe, but additional benefit/risk considerations are needed.

The benefits of omega-3 fatty acids from fish outweigh the risks of mercury and POPs if the types and sources of seafood to be avoided by some consumers are clearly communicated to consumers. The Committee's report says that eating two servings of seafood per week can reduce coronary heart disease or sudden death in persons with and without cardiovascular disease and can improve babies' eyesight and brain development during pregnancy and nursing.

Revisions to the Dietary Guidelines for Americans based on the DGAC suggestions are expected by the end of the year.

Source: Report of the Dietary Guidelines Advisory Committee on the Dietary Guidelines for Americans, 2010, Part D., Science Base, Section 3: Fatty Acids and Cholesterol and Section 8: Food Safety and Technology. (June 15, 2010). www.cnpp.usda.gov/DGAs2010-DGACReport.htm.

Mercury, continued from page 7

fish has a considerable margin of safety built into it.

To date there is no confirmed case on file with the Centers for Disease Control (CDC) of methyl mercury poisoning resulting from the consumption of seafood.

In 2004, the latest mercury advice came out jointly from the FDA and Environmental Protection Agency (EPA) for women who are pregnant or about to become pregnant, nursing mothers, and young children.

Mercury Does Not Appear To Endanger Food Supply

Mercury does not seem to be a threat to the US food supply based on all available data. Much of the bad publicity on mercury emerged from the misuse of mercury-treated materials. The biggest problem was uncontrolled dumping of industrial waste into the environment.

Caution has prevailed where possible mercury contamination exists. State and federal agencies now regulate industrial discharges of mercury, and mercury use in agriculture, to provide an increased margin of safety.

Freshwater Sport Anglers

High levels of mercury naturally occur in some freshwater lakes, rivers, creeks and reservoirs in California. Fish in these waters may contain high mercury levels. **The California Office of Environmental Health Hazard Assessment** annually issues fish consumption advisories on possible contaminants in sport fish. The latest consumption advisories are in the **California Sport Fishing Regulations** (available in sporting goods stores).

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