Mercury in Seafood

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 U.S. 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

Swordfish and tuna are the only commercially popular fish that may have a mercury content above 1 ppm. These two species accumulate mercury as they grow larger because they consume large amounts of small fish.

Commercial fishermen capture tuna and swordfish 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 tuna and swordfish 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 levels of mercury as high as those in fish being caught today. Scientists therefore conclude that mercury levels in tuna, and probably swordfish, have not changed in the past 100 years.

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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 fish has a considerable margin of safety built into it.

Only one suspected case of methyl mercury poisoning occurred in the U.S. from eating fish. A woman on a fad diet ate 12½ ounces of swordfish a day for 10 months, and later returned to the diet for 4 or 8 week periods. The woman developed mild mercury poisoning symptoms, but doctors misdiagnosed her symptoms on several occasions. The woman was off her diet for 5 months and lost almost all her symptoms by the time the doctors suspected mercury poisoning. Samples of her hair, however, still retained high but not toxic mercury levels. Doctors could not confirm the diagnosis of mild mercury poisoning, but believed the excessive consumption of swordfish caused the symptoms.

Mercury Does Not Appear To Endanger Food Supply

Mercury does not seem to be a threat to the U.S. 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 Department of Health Services annually issues health advisories on possible contaminants in sport fish. The latest health advisories are in the California Sport Fishing Regulations (available in sporting goods stores).

References

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