

Mitigating

Mercury Madness

by William Moss



What You Can Do to Help.

As a naturally occurring metal, mercury will not simply break down. People must take action to limit its threat.

Don't increase the amount of mercury in the environment. Dispose of batteries, thermometers, and fluorescent bulbs only at approved sites.

Select fish that are low in mercury. This is especially for women of child bearing age and children. Smaller fish and cultivated fish are usually less contaminated.

Write your representatives. Whether mail, e-mail, or text messages, let your representatives know that this is serious issue affecting your district. We have the technology to limit mercury contamination, but efforts have not been supported. Projects that would have immediate impacts, include: additive-tech devices on smokestacks that clean the emissions, sewer repairs, and invitrification (formation of stable solids) of municipal waste.

Mercury content in seafood is a hot issue

The Looming Threat of Mercury Contamination

What is Mercury?

Mercury (Hg) is metallic element, like iron, gold, and lead. Mercury is a unique metal in that it exists as a dense liquid at room temperatures.

What is the Source of the Mercury Pollutants?

A small amount of mercury naturally enters our environment from volcanic activity. However, the majority of mercury pollution comes from manufactured goods. Many of these items, like batteries and fluorescent lights, are disposable. Annually approximately 70% of processed mercury is disposed as waste. Waste burning facilities and coal plants add vast amounts of Hg to the atmosphere. Once there it forms a strong bond with raindrops and falls across the lands and waters. Most of Lake Michigan's mercury enters through precipitation.

How Does Mercury Contaminate our Fish?

Mercury by itself is not that much of a threat, but in anaerobic conditions (deep lakes, sediments, wetlands) bacteria combine methyl groups with mercury to form toxic methyl mercury (CH_3Hg^+). The methyl mercury congregates in organic debris, which is then consumed by lower level members of the food chain, like tiny crustaceans and fish larvae. As one thing eats another, methyl mercury moves up the food chain and accumulates in large fish. The concentration of CH_3Hg^+ in the water is usually in the parts per billion. Levels in fish can be a thousand times higher in the parts per million.

Why is Methyl Mercury Toxic?

Unlike many organic pollutants, which are stored in fat, methyl mercury is stored in the muscles of the fish. Humans consuming the fish are then exposed to toxic levels. In the body CH_3Hg^+ binds with cysteine, an amino acid. The body confuses this complex with the enzyme, methionine, which is necessary for proper development of growing tissue. When the methyl mercury - cysteine complex is transported to tissues instead of methionine, growth is damaged.

Prolonged exposure to mercury can permanently damage the brain and kidneys. Workers continually exposed to mercury vapors while making felt hats developed nervous symptoms. This is the origin of the phrase "mad as a hatter" or "mad hatter". In developing tissues these effects can occur from brief contact, which makes mercury exposure particularly dangerous to pregnant women and fetuses. Mercury complexes easily pass through the blood/brain barrier and the placental barrier.