Methylmercury in the food web: from fish to people

Methylmercury is absorbed by fish when contaminated water passes through their gills or when they eat a contaminated food source. Methylmercury is persistent, meaning it is slowly removed from the body, and will build up in individual fish or people. This process is called *bioaccumulation*.

As prey fish are eaten by larger predator fish, and eventually by humans, the methylmercury can greatly increase up the food chain. This process is called *biomagnification*.

**What is mercury?** Mercury is a naturally occurring metal that is present throughout the environment in low concentrations. Mercury is generally present in the environment as either inorganic mercury or as organic methylmercury. Inorganic mercury comes in three forms: elemental, mercuric, and mercurous.

**Where does mercury in fish come from?** Worldwide, 66% of mercury in the environment comes from human-made sources, mostly released to air and water.

**What is methylmercury? How is it created?** Methylmercury is the type of mercury found in fish and is much more dangerous to human health than inorganic mercury. Methylmercury can be absorbed into the body six times faster than inorganic mercury, and it is taken into the part of the fish that people usually eat — the muscle tissue. This means that methylmercury is more bioavailable than other forms of mercury. Because of this high bioavailability, methylmercury can account for more than 95% of the mercury in fish tissue.

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Are there regulations for mercury in fish?

Yes, fish consumption advisories are set to help people make informed decisions about eating local fish. Fish provide many dietary benefits as a source of lean protein, omega-3 fatty acids, and essential nutrients, but fish are also the main source of mercury exposure for most people. In North Carolina, there is a statewide advisory for mercury. Women of childbearing age (age 15–44), pregnant women, nursing women, and children under 15 should not eat fish high in mercury, including largemouth bass. Check your local advisory for more information – see below.

How can methylmercury affect my health?

Eating certain fish is a source of low doses of mercury for extended periods of time. These low-level, chronic exposures have been shown to affect the nervous system and muscle coordination.

Children and pregnant women are the populations of greatest concern for mercury exposure. Mercury exposure in pregnant women may damage a developing fetus by passing through the placenta barrier to the fetus. The brain and nervous system of a developing fetus or a young child is more susceptible to damage than adults.

What is a serving?

For an adult
4 ounces

For children, ages 4–7
2 ounces

Where can I get more information?

- North Carolina Department of Health and Human Services: epi.publichealth.nc.gov/oee/fish/advisories.html
  Fish Consumption advisories for the State of North Carolina
- Duke University Superfund Research Center Community Engagement Core: What’s in my fish?
- UNC-Chapel Hill Superfund Research Program: eatfishwisely.org
  Guide to Eating Locally-Caught Fish in the Triangle
- NCSU Center for Human Health & the Environment: appliedecology.cals.ncsu.edu/fish-consumption/
  What You Need to Know about Eating Freshwater Fish in NC: Fish Consumption Advisories

Cited references available on request