

HEALTH ISSUES REGARDING FISH CONSUMPTION

Prepared by the Iowa Department of Public Health

Fish is a Part of a Healthy Diet

Fish is an important part of a healthy diet. There are many nutritional benefits from including fish in your diet. Fish are low in saturated fats and contain high-quality protein and omega-3 fatty acids (a class of fatty-acids that are essential for cell development and have other beneficial health effects). Fish also supply a number of vitamins and minerals that tend to be low in the typical U.S. diet; including calcium, iron, zinc, vitamin A, niacin, vitamin B6 and vitamin D. Eating fish can contribute to a healthy heart and a child's proper growth and intellectual development.



Everyone is encouraged to include fish in their diet, including women and young children. The Iowa Department of Public Health (IDPH) and several national health organizations recommend that people of all ages eat fish a minimum of twice per week to achieve optimal health benefits. Pregnant women should eat fish to ensure proper fetal development. Eating fish may protect against a variety of diseases and illnesses in adults, such as cancer, cardiovascular disease, dementia, diabetes, depression, rheumatoid arthritis, psoriasis, prostate cancer, stroke and autoimmune disease.

Chemicals in Fish

Concerns have long existed about whether fish are safe to eat due to the trace amounts of chemicals that may be present in fish tissue. Low levels of natural and man-made chemicals are in the water in which fish live. These chemicals can accumulate in the tissue of fish. Three of the chemicals that can accumulate in fish tissue are mercury, polychlorinated biphenyls (PCBs), and chlordane.



Mercury is a naturally occurring element in the environment and is also released into the air through industrial pollution. Mercury that falls from the air can accumulate in streams, rivers, lakes and the ocean. Bacteria in the water cause chemical changes that transform mercury into methylmercury. Fish absorb the methylmercury as they feed in these waters. Methylmercury builds up more in some fish than others depending on what they eat how long they live, and how high up the food chain they are.

PCBs are a family of more than 200 chemical compounds. PCBs were discovered over 100 years ago, but their production and commercial use began in 1929. Because of their remarkable insulating capacity and their flame-retardant nature,

PCBs gained widespread use as coolants and lubricants in transformers and other electrical equipment. Manufacture and use of PCBs was banned in 1979; however, PCBs are extremely persistent in the environment and biomagnifies within the food chain. As with methylmercury, fish absorb PCBs as they feed in water containing PCBs; and the PCBs build up more in some fish than others depending on what they eat, how long they live, and how high up they are in the food chain.

Chlordane is a man-made chemical that was used as a pesticide in the United States from 1948 to 1988. Prior to 1978 chlordane was used as a pesticide on agricultural crops, lawns, and gardens and as a fumigating agency. From 1983 to 1988 chlordane was only approved to be used to control termites in homes. As with PCBs, chlordane is extremely persistent in the environment and biomagnifies with the food chain. Fish absorb chlordane as they feed in water containing chlordane; and the chlordane accumulates more in the fatty tissue of some fish than others depending on what they eat, how long they live, and how high up they are in the food chain.

What are the levels of methylmercury, PCBs, and chlordane in fish that we may eat that pose risks to human health? The U.S. Food and Drug Administration (FDA) has established the following action levels in commercially bought fish at 1 milligram/kilogram (mg/kg) or part per million (ppm) methylmercury, 2 ppm PCBs, and 0.3 ppm chlordane.



According to the FDA, the general population can consume fish with the presence of methylmercury, PCBs, and chlordane at up to these levels with no adverse health effect. The U.S. Environmental Protection Agency (EPA) has also developed screening values for the presence of chemicals in fish based upon risk-based analysis. The EPA screening levels in fish are 0.4 ppm methylmercury, 0.02 ppm PCBs, and 0.114 ppm chlordane. These screening levels are, according to EPA, the levels of chemicals within fish tissue at which there may be public health concerns for consumption of recreationally caught fish.

The IDPH and the Iowa Department of Natural Resources (IDNR) have developed a protocol that combines the FDA safe level guidelines and the EPA risk-based levels to evaluate safe levels of chemicals within fish and to post consumption advisories for fish caught in Iowa lakes and rivers. The IDPH and IDNR protocol also attempts to account for the health benefits from eating fish. Reports from Harvard School of Public Health indicate that inappropriately curtailing fish consumption can increase ones risk for adverse health outcomes. Seafood and fish available in Iowa grocery stores and restaurants follow the FDA safe level guidelines. For the case of fish caught in Iowa lakes and rivers, the IDPH and IDNR protocol evaluates the levels of chemicals in fish and as a result these agencies may post consumption advisories recommending limiting the consumption of certain types of fish from specific water bodies.



If a consumption advisory is posted, the recommendation may include eating only one meal per week of a specific type of fish from a specified water body, or avoiding consumption of a specific type of fish from a specified water body altogether. The IDNR and IDPH recommend the following groups limit their consumption to one meal per week of larger size predator fish, such as walleye and bass, which are more likely to have higher concentrations of mercury: 1) pregnant and nursing women, 2) those planning to become pregnant and 3) children 12 years of age and younger. Although a recommendation may be made to limit consumption of certain types of fish from specific water bodies, the IDPH still recommends that all Iowans eat fish from a variety of sources at least twice per week.

Levels of Methylmercury, PCBs, and Chlordane in Iowa Fish

Since 1980, the IDNR has conducted annual sampling and analysis to determine the presence of these and other chemicals in fish from Iowa lakes and rivers. In only a few cases did the levels of methylmercury, PCBs, or chlordane in Iowa fish exceed the current levels for posting a "no consumption" advisory. In some cases, the levels of mercury, PCB's, or chlordane may be slightly elevated. In these cases, the IDPH and IDNR protocol currently recommends that consumption of these types of fish from specific water bodies be limited to one meal per week. The IDNR annually collects fish tissue samples from approximately 20 locations on Iowa rivers and lakes. A different group of sampling locations is chosen each year. Iowa fish are generally safe to eat if properly cleaned and prepared. Further information regarding the safety of fish from Iowa lakes and rivers and fish consumption advisories can be obtained from the IDNR web site at: <http://www.iowadnr.com/fish/news/consump.html>

All Fish and Seafood Available in Iowa

As stated before, fish and seafood are an important part of a healthy diet. Some store-bought fish may have higher levels of trace chemicals than the levels of fish caught in Iowa. The FDA and the EPA have prepared a joint advisory regarding consumption of fish. The advisory recommends that women who are planning to become pregnant; pregnant; nursing; or young children limit their consumption of fish that may have a higher content of methylmercury than other fish.



This group of people can reduce any potential health risks from eating potentially contaminated fish by:

- Eliminating the eating of the potentially more contaminated marine (or "saltwater") fish species sold in grocery stores such as: Shark, Swordfish, King Mackerel, or Tilefish
- Choosing smaller-sized fish to eat when consuming locally-caught fish

- Limiting your fish consumption to 12 ounces or two meals per week
- Limiting your consumption of albacore or “white” tuna to six ounces or one meal per week
- Limiting your consumption to the lean (non-fatty) portions of the fish
- Following these same recommendations when feeding fish and shellfish to your children, only use smaller portions

Further information about this advisory can be found at both the FDA web site at: <http://www.cfsan.fda.gov/~dms/admehg3.html> and the EPA web site at: <http://www.epa.gov/waterscience/fishadvice/advice.html>