

## Wisconsin Residents: Enjoying Fish as Part of a Healthy Diet



There has been a significant promotion of fish intake in recent years because of its high quality protein content, generally low fat content, and easy access for those who enjoy fishing. Fish and shellfish are also a good source of **omega-3 fatty acids**, which have been associated with human health benefits. The 2005 Dietary Guidelines for Americans encourages consumers to choose fish as part of a healthy diet because of the presence of heart-healthy unsaturated fatty acids.

Wisconsin residents enjoy access to many lakes and streams, some of which are prime fishing spots. Two contaminants, **methyl mercury** (mercury) and **polychlorinated biphenyls** (PCBs), are the contaminants of greatest concern in fish caught in Wisconsin waters. To reduce people's exposure to these contaminants, the Wisconsin Department of Natural Resources (DNR) issues advice to help individuals choose what fish caught in Wisconsin waters to keep, as well as how often and how much fish to eat.

Nearly all commercially harvested fish and shellfish contain traces of mercury. For most people, the risk of mercury poisoning from eating fish and shellfish is not a health concern. Yet, some fish and shellfish contain higher levels of mercury that may harm an unborn baby or a young child's developing nervous system. The risks from mercury in fish and shellfish depend on the amount of fish and shellfish eaten and the levels of mercury in the fish and shellfish. The Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA) have issued joint guidelines to encourage consumers to select appropriate amounts and types of commercial fish and shellfish to limit exposure to mercury.

Consumers may find this apparent contradiction confusing: should they choose fish as recommended in the new dietary guidelines, or should they limit intake due to concern over possible contamination? This fact sheet summarizes the current fish consumption guidelines for Wisconsin citizens and provides some recommendations for including fish as part of a healthy diet.

**Contaminants of concern.** Mercury and PCBs differ in where they come from, where they accumulate in fish, and how they affect human health. High amounts of **mercury** can be released into the air when power plants burn coal, when incinerators burn mercury-containing waste, and during the production of other chemicals. Airborne mercury attaches itself to water and dust particles and enters lakes, steams and oceans in rain, snow and runoff. One form of mercury, methyl mercury, is easily absorbed by fish and other organisms living in contaminated waters. Fish absorb mercury directly from water passing over their gills or by ingesting other mercury contaminated organisms. Larger, older and more predatory fish often contain relatively high mercury levels compared to smaller or younger fish. Mercury accumulates in the muscle of fish, so trimming, skinning, and cooking will not reduce mercury levels in fish.

Unborn fetuses and children under the age of 15 are more sensitive to mercury than adults. Mercury affects the central nervous system; damaging the developing brains of children and potentially affecting a child's behavior and ability to learn. Mercury crosses the placenta and is present in breastmilk. Thus, women of childbearing years should limit their exposure to mercury to minimize its transfer to the developing fetus or infant. A child's exposure to mercury-contaminated fish should, therefore, be **strictly limited**. Mercury is not as dangerous for healthy, non-pregnant or non-nursing, adults because their bodies can eliminate mercury faster

than children can. For all people, especially children and pregnant or nursing women, spacing fish-containing meals out over time can help reduce the amount of mercury in their bodies.

**PCBs** are synthetic (man-made) substances that were used until 1977 in the manufacture of electrical transformers and other industrial items. PCBs are also by-products of plastic incineration, such as when medical waste is burned, and were, until recently, a major by-product of paper-bleaching. PCBs are slow to break down in the environment and continue to be a problem. PCBs released into the environment accumulate in lake and stream sediment. The Great Lakes and rivers in Wisconsin with heavy industrial use are more likely to have PCB-contaminated fish than inland waters. Fish absorb PCBs from contaminated sediments suspended in the water and from their food. Absorbed PCBs accumulate in the fat of fish, leading to higher levels of PCBs in fatty fish. Cooking fish so that fat melts away (broiling, grilling) and/or trimming and skinning fish will remove some of the PCB contamination.

PCBs cause a variety of health problems. Infants and children of women who have eaten a lot of contaminated fish may have lower birth weights and may experience mental and physical developmental delays. PCBs may affect reproductive function and the immune system, and the presence of PCBs in the diet is associated with increased cancer risk. Because the developing fetus and young child are more sensitive to the toxic effects of PCBs, women of childbearing years, as well as pregnant and nursing women, should minimize their PCB exposure to reduce the amount of PCBs transferred via the placenta to the fetus, and via breastmilk when nursing.

**Sources of contaminated fish and safe eating guidelines.** Contaminated fish may be harvested from local, in-land waters or from the Great Lakes. Contaminated fish may also be harvested from other bodies of water, such as the ocean, often by commercial fishing vessels. The following recommendations highlight fish consumption guidelines for each of these sources of fish.

**Safe eating guidelines for most of Wisconsin's inland (non-great lakes) waters**

***Women of childbearing years, nursing mothers, and children under 15 may eat:\****

- 1 meal per week: Bluegill, sunfish, black crappie, white crappie, yellow perch or bullheads, **and**
- 1 meal per month: Walleye, northern pike, smallmouth bass, largemouth bass, channel catfish, flathead catfish, white sucker, drum, burbot, sauger, sturgeon, carp, white bass, rock bass or other species.

*(\*Muskie should **not** be eaten by this group of people due to high mercury content. One average meal per week = 6 ounces.)*

***Women beyond their childbearing years and all men may eat:***

- Unlimited amounts: Bluegill, sunfish, black crappie, white crappie, yellow perch, or bullheads, **and**
- 1 meal per week: Walleye, northern pike, smallmouth bass, largemouth bass, channel catfish, flathead catfish, or other species.

On certain waters, **more restrictive** advice is needed because fish have been found to contain higher levels of mercury or PCBs. The listing for specific lakes and streams in Wisconsin can be found in the bulletin *Choosing wisely: A health guide for eating fish in Wisconsin* available from your local DNR office or online: <http://www.dnr.state.wi.us/org/water/fhp/fish/pages/consumption/>.

### **Safe eating guidelines for Great Lakes waters**

While the average adult person in Wisconsin basin may not be at risk of experiencing adverse health effects from exposure to contaminants through the consumption of fish, there are some people who are at risk. These include people who eat a lot of Great Lakes fish, regularly eat large predator fish, eat fish from highly contaminated waters, or eat a large amount of fish over a short period of time. In addition, the developing fetus and young children are at greater risk than adults. The **Environmental Protection Agency (EPA)** and the **Great Lakes Commission** offer the following advice for reducing exposure to contaminants found in Great Lakes fish:

#### ***Reducing exposure to critical contaminants from Great Lakes fish***

1. **Eat pan fish rather than predator fish.** Pan fish have lower concentrations of contaminants because they are lower on the food chain. This means that they have consumed less contaminated material and therefore carry lower levels of those contaminants in their bodies.
2. **Eat smaller predator fish rather than larger predator fish.** Smaller fish are generally younger and have had less time to build up contaminants.
3. **Be aware that contaminants in fish pose different risks for different ages of people, and greater risks for certain groups.** Great Lakes fish should be consumed no more than monthly by women of child-bearing years, women who are pregnant, mothers who are currently breast-feeding, and children under 15 years of age.
4. **Choose farm-raised fish or fish from lakes, rivers, and other bodies of water that are known to have lower levels of contamination.** The levels of various contaminants in fish can vary greatly by the body of water from which they're caught. (See local DNR advisories.)
5. **Space meals out over time.** Some contaminants, like mercury, can be eliminated by the human body.
6. **Choose leaner types of fish, and removing as much fat as possible when cleaning or preparing fish.** PCB-contaminants are stored in the fat. Mercury, however, is stored in the protein and so is not reduced by cooking and cleaning. Cut off the skin where much of the fat is stored. Remove the belly fat and the fatty meat under the stomach of the fish. Fatty areas are darker in color on fish like salmon and trout, but may be lighter on other fish such as bass and walleye. Throw the fatty parts away.
7. **Bake, broil, grill, roast, boil or poach fish.** Do not fry fish; this locks in the fat which may be high in PCBs. **Throw away** any leftover juices or grease, including water in which fish was boiled or poached. Do not use them to make a soup or stock.

**About different types of fish.** Pan fish and predator fish are common names for large, diverse groups of fish. These names have many different meanings for many different people. In general, a **pan fish** tends to be a smaller fish that is cooked by frying in pan (as opposed to poaching or grilling, as with salmon). Typical pan fish are bluegill, pumpkinseed, small and largemouth bass, white and black crappie, even yellow perch.

**Predatory fish** are defined as any fish species that eat other fish. Almost all fish species are predatory, with the exception of carp, which eat plants. Some of the more common predatory species are walleye, northern pike, steelhead, salmon, and small and largemouth bass.



Both **pan fish** and **predatory fish** may be referred to as **sport fish**. A sport fish is any fish that is caught using a rod and reel.

**Safe eating guidelines for fish and shellfish from non-Wisconsin, non-Great Lakes waters**

Many of us get our fish and shellfish from the grocery store, either fresh, frozen or canned. In general such fish is not harvested from Wisconsin waters. The U.S. Food and Drug Administration (FDA) offers fish consumption advice for purchased fish and shellfish:

**Safe consumption guidelines for pregnant women, women of child-bearing age and young children consuming salt-water fish:**

- **Do not eat:** shark, swordfish, king mackerel, or tilefish because they contain high levels of mercury.
- **Eat up to 12 ounces (2 average meals) a week of a variety of fish and shellfish** that are lower in mercury. Five of the most commonly eaten fish that are low in mercury are **shrimp, canned light tuna, salmon, pollock, and catfish**. Note: Another commonly eaten fish, canned albacore ("white") tuna has more mercury than canned light tuna. So, when choosing meals, canned 'white' or albacore tuna may be consumed in **one average meal** per week (**6 ounces**). **Tuna steak** should also be limited to one meal per week.
- **Check local advisories** about the safety of fish caught by family and friends in your local lakes, rivers, and coastal areas. If no advice is available, eat up to 6 ounces (one average meal) per week of fish you catch from local waters, but don't consume any other fish during that week.

Follow these same recommendations when feeding fish and shellfish to your young child, but serve smaller portions.

(Available online in both English and Spanish <http://www.cfsan.fda.gov/~dms/admehg3b.html>)

**How do these recommendations fit together?** If you are pregnant, is it possible to eat one meal of bluegills per week, plus have tuna casserole for dinner that same week? Can you still have one meal of walleye each month? The Wisconsin Department of Health and Family Services (DHFS) has attempted to combine local and national guidelines:

**Safe eating guidelines for women who are pregnant, planning to be pregnant, or are breastfeeding and for children under age 15**

for most of Wisconsin's inland (non-Great Lakes) waters and fish bought in stores and restaurants:

**WEEKLY:**

- 1 meal per WEEK of Canned Light Tuna\* AND 1 meal per WEEK of either
  - Bluegill, sunfish, black crappie, white crappie, yellow perch, bullheads OR
  - Any commercial fish (fish you buy in a store or restaurant)

**MONTHLY:**

- 1 meal per month of any sport fish species (such as bass, walleye, northern, perch, or crappie). Sport fish are NOT fish you purchase in a store or restaurant.

**NEVER:**

- Never eat ANY shark, swordfish, king mackerel, or tilefish

These guidelines suggest that women and young children **can** eat one serving of pan fish caught in most local Wisconsin waters **and** one serving of commercial fish species per week (one serving equals 6 ounces). This meets the total FDA recommendation of two servings of fish per week. Consumers need to choose younger, lower-fat fish, properly prepared, in order to combine servings. In addition, women and young children may consume one additional meal per month of most any sport fish species. These same consumers should never eat any swordfish, shark, king mackerel or tilefish, or fish strictly prohibited in local advisories. [This guideline is available online <http://www.dhfs.state.wi.us/eh/fish/FishFS/MercryBrchre.pdf> and multiple

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copies may be available from the Wisconsin Department of Health and Family Services (608) 266-1120. Other useful information is also available online from DHFS <http://www.dhfs.state.wi.us/eh/fish/index.htm> ]

Overall, fish consumption is strongly encouraged. When fish types are selected appropriately, healthy adults can consume the recommended two servings of fish per week as part of a healthy diet.

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#### References:

1. Smith, K.M. and N.R. Sahyoun. 2005. Fish consumption: Recommendations versus advisories, can they be reconciled? *Nutrition Review* 63:39-46
2. United States Department of Agriculture. Dietary Guidelines for Americans 2005 <http://www.health.gov/dietaryguidelines/dga2005/document/> accessed 6/8/05.
3. United States Department of Health and Human Services and Environmental Protection Agency. March 2004. What you need to know about mercury in fish and shellfish: 2004 EPA and FDA Advice For: Women Who Might Become Pregnant, Women Who are Pregnant, Nursing Mothers, Young Children <http://www.cfsan.fda.gov/~dms/admehg3.html> accessed 6/3/05.
4. United States Environmental Protection Agency. 2005. Fish consumption in the Great Lakes. <http://www.great-lakes.net/humanhealth/fish/index.html> accessed 6/1/05
5. Wisconsin Department of Health and Family Services. Eating Safe Fish. <http://www.dhfs.state.wi.us/eh/fish/index.html> accessed 6/9/05.
6. Wisconsin Department of Natural Resources. 2005. Choose wisely: A health guide to eating fish in Wisconsin. <http://www.dnr.state.wi.us/org/water/fhp/fish/pages/consumption/choosewisely05.pdf> accessed 6/1/05.