

# EATING LAKE MICHIGAN FISH

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## What Are PCBs?

PCBs, polychlorinated biphenyls, are colorless and odorless chemicals that were widely used in electrical equipment and other industrial applications before they were banned in 1976. These man-made chemicals are considered toxic because exposure to small doses is suspected of contributing to a variety of health problems. PCBs do not quickly decompose into less harmful chemicals, so they are extremely persistent in the environment.

Even after all inputs of PCBs into the Great Lakes have stopped, the chemicals will remain in the food chain for years. Several studies are currently underway to determine how long contaminated sediment will continue to contribute PCBs into the aquatic food chain.

## Are PCBs Still Entering the Environment?

Yes. Of the 1.4 billion pounds of PCBs produced in this country before 1976, about half has entered the environment via discharges to air, land and water. Products that contain PCBs are also still being disposed of. The problem is, PCBs remain mobile in the environment, leaching out of landfills into rivers and lakes, and evaporating into the air. Scientific studies have shown that atmospheric fallout accounts for a substantial amount of the PCBs entering the Great Lakes today.

## What Levels of PCBs are Considered Safe in Fish?

The U.S. Food and Drug Administration has determined that fish containing PCBs at levels over 2 parts per million (ppm) pose a health risk to people who eat them. One part per million is comparable to one cup of milk out of the total volume of 16 milk trucks. Commercially caught fish containing more than 2 ppm PCBs cannot be sold for human consumption. Based on this standard, the states bordering Lake Michigan have issued health advisories concerning consumption of certain sport-caught fish. The standard is based on the fact that high levels of PCBs have caused cancer in exposed laboratory animals. Medical authorities suspect prolonged exposure to small doses of PCBs can contribute to a variety of human health problems, including developmental problems in children, liver damage and cancer. The federal PCB tolerance level in fish is based on the assessment that the average person, consuming 13 pounds of fish per year, will not accumulate dangerous levels of contaminants over his or her lifetime. As in fish, PCBs accumulate in humans and are not passed out of the body.

## Why Are PCBs a Problem in Lake Michigan Fish?

Most PCBs in the environment end up in rivers, streams, lakes and, ultimately, the oceans. Once there, PCBs enter the food chain and become progressively concentrated from small organisms to large fish and, finally, in people who eat the fish. Many large, fatty fish like lake trout, carp and chinook salmon have been found to contain PCB concentrations 100,000 to one million times greater than the concentrations in surrounding waters. As a result, some fish contain high enough PCB levels that they are considered unsafe for human consumption.

## What Is the Risk of Eating Great Lakes Fish?

There is controversy over whether PCBs, when consumed at the levels found in Great Lakes fish, actually harm humans. But the longer you live and the more PCBs you ingest, the more PCBs you are likely to concentrate in your body, so state health agencies recommend that you limit your consumption to fish with PCB levels below 2 ppm. Most people today have traces of PCBs in their blood and fatty tissues. Individuals who consume large quantities of fish that contain high PCB levels (such as large chinook salmon, brown or lake trout) from the Great Lakes, especially from Lake Michigan, will have substantially higher intakes of PCBs than the general population. Based on conservative projections from animal studies, such individuals may face an increased risk of developing cancer. However, it is far more dangerous to smoke cigarettes or not wear a seat-belt than to eat Great Lakes fish. All three of these risks are voluntary and can be minimized by an individual.

## How Long Will PCBs Remain a Problem in Lake Michigan Fish?

Unlike sugar, which is metabolized and passed through an animal's body, most PCBs tend to build up over time in a fish's fat and tissues. The older a fish is, the more it has eaten, the more PCBs it has concentrated in its body. In large older fatty fish, PCBs may remain a problem for at least a decade. Because PCBs become attached to particles in the lake, they eventually settle out and are buried in bottom sediments. However, it takes a long time for PCBs to become permanently buried. As bottom-dwelling organisms feed, they ingest these PCBs and pass them back into the food chain.

## Is the Risk Higher in Some People?

Yes. Medical studies indicate the risks of developmental or health problems from ingesting PCBs are highest for the developing fetus or nursing infant whose mother is or has previously been exposed to PCBs, whether from eating fish containing PCBs or from other sources. A pregnant woman can transfer relatively high doses of PCBs directly to her fetus, and later her infant can receive additional PCBs through her milk. It is best to minimize exposure to infants because of their small size and potentially high body-dose. Women of childbearing age are advised to avoid eating fish that do not meet federal health standards. Men, and women past their childbearing years or women who do not plan to have children, face a relatively low health risk from eating PCB-contaminated fish (based on the average consumption of 13 pounds of fish per year).

## What Kinds of Fish Are Most Contaminated?

It is the larger older fish, which have eaten more food (especially oily alewives), that have the highest levels of PCBs. Lake trout can live in Lake Michigan for 10 years, so they generally contain more PCBs than chinook salmon, which only live in the lake for three to four years. Coho salmon, which are in the lake only two or three years, contain even lower levels than chinook salmon. However, the amount of PCBs in two similar sized fish of the same species, caught in the same area of the lake, can vary greatly. Recent samples indicate these Great Lakes sport fish are likely to contain PCB levels higher than 2 ppm and, according to fish consumption advisories, should not be eaten:

- Lake trout over 23 inches.
- Brown trout over 23 inches.
- Chinook salmon over 32 inches.

Furthermore, children and women of childbearing age are advised to avoid eating:

- Lake trout over 20 inches.
- Chinook salmon over 21 inches.
- Coho salmon over 26 inches.
- All brown trout.

Many other species of fish in Green Bay contain PCB levels higher than those found in Lake Michigan fish. For information on these fish, contact the nearest Wisconsin Department of Natural Resources office.

## Are PCB Levels in Fish Declining?

Yes. PCB levels in most Lake Michigan fish appear to have declined dramatically in the last 10 years, and this trend seems to be continuing. However, PCBs remain a problem in lake trout, due to their size, age and alewife diet. Levels of PCBs in fillets taken from large lake trout formerly tested around 25 ppm PCBs. Today, they test out at 6-8 ppm. Levels in larger chinook salmon have dropped, but they remain in the 2-5 ppm range. The states around Lake Michigan have stepped up their sampling programs and pooled their information to determine the PCB levels in the lakes' fish more accurately.

Due to the vast amount of PCB-contaminated sediment in Green Bay, however, declines in PCBs in fish tissue there have not been as evident over the past few years.

## Are Small Fish Less Contaminated?

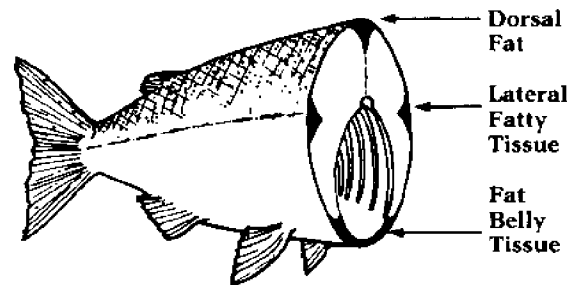
Yes. Small fish and fish that do not feed on alewives contain lower levels of PCBs because they have not lived as long and ingested enough PCBs to have accumulated high levels of the chemical. Lake trout smaller than 23 inches, coho salmon and rainbow trout generally have PCB levels below 2 ppm. Perch and smelt contain PCB levels lower than any other Lake Michigan sport fish.

## Can Cleaning Fish Reduce PCB Levels?

Yes, but not always enough to bring PCB levels below 2 ppm. Great Lakes fish consumption advisories are based on an analysis of fish fillets, including the skin and certain fatty areas. You can significantly reduce the level of PCBs in fish by properly cleaning, trimming and skinning your catch. It is important to trim all the fat from four key areas: the belly flap, lateral line, along the backbone, and adjacent to the skin. Tests on chinook salmon from Lake Michigan show that proper removal of the skin and fat from these four key areas reduced PCB levels by more than 50 percent. Similar tests on lake trout show that PCB levels can be reduced by more than 30 percent.

### Cleaning and Trimming

- Remove all of the skin.
- Cut away the dark meat on top of fish along the backbone.
- Slice off the fat belly meat along bottom of fish.
- Cut away a V-shaped wedge along the lateral line on each side of whole fish or on skin side of each fillet.



## Can Cooking Fish Reduce PCB Levels?

Yes. While cooking does not destroy PCBs, the heat from cooking melts the fat in the fish, thus removing some of these contaminants. It is not advisable to deep-fry your Great Lakes catch. It is best to broil or bake trimmed, skinned fish on an elevated rack so any additional fat melted out of the fish drops off. Do not use the drippings for sauces: Dump the drippings in the garbage. If you boil or poach your fish, discard the fish broth. Studies on smoked fish have shown that while some oil leaves the fillets, a significant amount of moisture also leaves, so smoking does not substantially reduce PCB levels.