

Mercury, Dioxin, and PCBs

Contamination in Fish

and Children's Health

Indigenous Women's Mercury Investigation

c/o North American Water Office

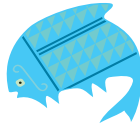
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What are the Threats to Child Health?



MERCURY is a deadly neurotoxin. It builds up in the body and damages the brain and spinal cord. Mercury can change the way you walk, talk, see, and hear. It can also cause irritability, depression, anxiety, and loss of self-confidence. At low levels, adult symptoms include abnormal sensations such as tingling or loss of feeling in the feet and hands or about the mouth. High levels of mercury poisoning can cause death.

Babies born to 1 in 10 US women of childbearing age are at risk of having nervous system disorders due to in-the-womb mercury exposure (US Center for Disease Control) from eating mercury contaminated fish.

Indigenous Peoples, Asians, Pacific Islanders, and other multiracial people are disproportionately at risk from this contamination because of cultural dietary preferences or poverty.

A National Health and Nutrition Examination Survey for the years 1999-2002 demonstrated that women in these groups had 17% higher blood mercury.

HEALTH EFFECTS OF MERCURY POISONING

FETUS, INFANT, AND YOUNG CHILDREN POISONING SYMPTOMS:

BRAIN DAMAGE
MENTAL & PHYSICAL RETARDATION
CEREBRAL PALSY
DELAYED WALKING & TALKING
BEHAVIOR PROBLEMS
LEARNING DISABILITIES
DEATH

ADULT POISONING SYMPTOMS:

DAMAGE TO KIDNEYS AND NERVES
CHANGES IN PERIPHERAL VISION
TINGLING, PRICKLING, OR NUMBNESS
IN HANDS, FEET, NOSE AND LIPS
DAMAGE TO MALE SPERM
STUPOR, CONVULSIONS, COMA, & DEATH
LONG TERM EXPOSURE CAUSES
PERSONALITY CHANGES, IRRITABILITY,
DEPRESSION, ANXIETY, AND LOSS OF
SELF CONFIDENCE

Walleye



LARGE Walleye and

Northern Pike

ARE NOT SAFE

ONE MEAL A MONTH OF THESE FISH

ONLY IF THEY ARE

20 INCHES OR SHORTER .

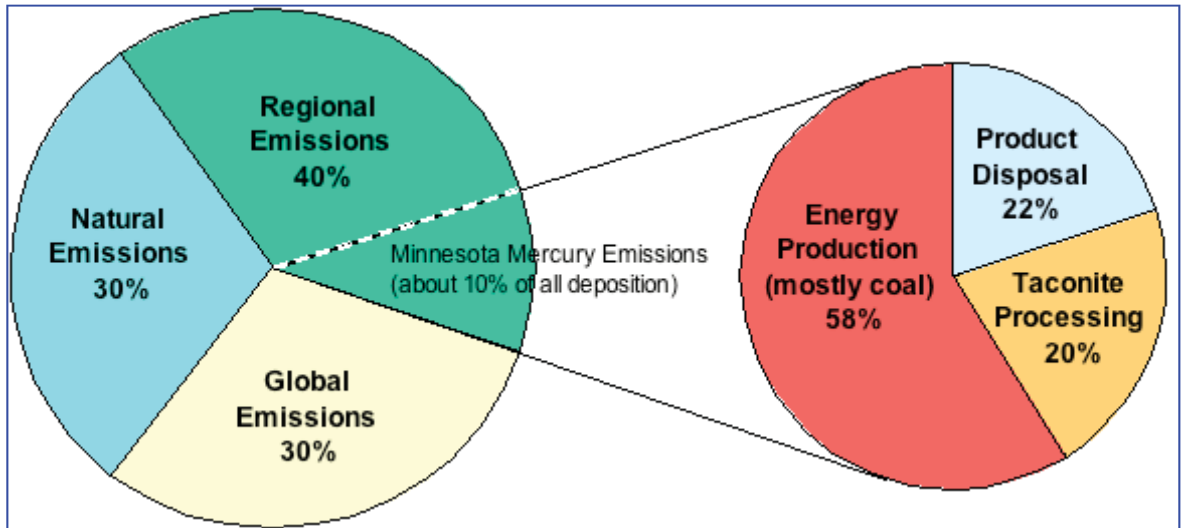
Northern pike



Women of child bearing age, nursing mothers , children under fifteen, and fishing guides are at extreme risk from mercury contamination. *Mercury crosses the placenta and is excreted in breast milk.* Fetuses and young children are 4 to 5 times more sensitive to methyl mercury than adults. Changes to the nervous system of fetuses and young children are not reversible and may result in mental retardation and cerebral palsy. Women and children should eat only smaller safer fish.

Five years ago it was possible to eat the safer types of fish every day. Now only one safe fish meal a week is advised by the Health Department. Large *Walleyes and Northern Pike* **should not** be eaten at all by *women and children.* Men may also have cause for concern. Animal studies show that mercury can damage sperm.

MERCURY EMISSION ESTIMATES IN MINNESOTA



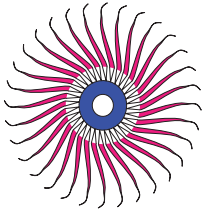
Source: Minnesota Pollution Control Agency 2005

Mercury in fish has been a growing problem in Minnesota for over thirty years. Forty one states have fish consumption advisories. Minnesota, Wisconsin, Michigan and Florida have the most mercury contamination in fish.

Minnesota's mercury emissions are approximately 3,175 pounds reduced from 11,300 pounds in 1990. Efforts to stop the use of mercury in products, such as, mercury in latex paint and the

mandated control of garbage incineration stack gases yielded these past reductions.

New mercury legislation passed with bipartisan support in 2006 will reduce the mercury emissions from the 3 largest coal fired power plants (Xcel Energy's Sherburne County Plant, the A.S. King Plant, and Minnesota Power's Clay Boswell Plant) in Minnesota by 1,200 pounds a year. Public interest groups must keep up the pressure to enforce the law.



Indigenous Women's Mercury Investigation

We have been conducting oral histories since 2002 with Ojibwe and Dakota tribal members from Minnesota's Indigenous Nations and Communities on the role of water and value of fish to cultural survival, and the impacts contamination from mercury, dioxin and PCBs have on the health of Indigenous Peoples.

Conclusions to date document that:

1) Families on 9 of 11 reservations rely on fish for more than one meal a week; 2) Two reservations have been told not to fish from the Minnesota and Mississippi Rivers; because the fish are too contaminated to eat; 3) Tribal members at poverty levels rely on catching larger fish because this means more family members can be fed with less work; 4) Fish species that are preferred by many Tribal families are not necessarily those tested or monitored by Minnesota Department of Health (MDH) (Black Buffalohead, Tullibee, White Suckers); 5) Few tribal members had ever seen the educational materials available on mercury, dioxin, and polychlorinated biphenols

contamination in Minnesota fish produced by MDH or had any positive interaction with MDH staff; 6) Even with education about the contamination threat to health, those at subsistence levels will continue to eat fish daily because they must; 7) When independent research was conducted by Tribes contamination hot spots were identified by their Environmental Specialists contrary to the MDH claims that none exist (Fond du Lac/Grand Portage Fish Consumption Advisory Project Final Report, 2001); 8) Fish consumption surveys utilized by the Minnesota Pollution Control Agency and MDH (Fish Consumption Survey: Minnesota and North Dakota Final Report, Environmental Research Center UND, 2001) to determine contaminated waters clean-up to allow for one fish meal a week were not representative of overall Indigenous Peoples in Minnesota nor did they include our Asian Immigrants, African Americans, African Immigrants, or Latinos.

9) When families consumed fish in excess of the State Health Department guidance children had health and behavior problems. 2007

Which fish are safer to eat?

PERCH



CRAPPIE



ROCK BASS



BLUEGILL



Safer fish

to eat are

**bluegills, crappies,
rock bass and perch.**

**These fish may be eaten once a
week by
all children ,
nursing mothers and women
of child-bearing age.**

For information on

specific lakes and rivers

www.health.state.mn.us/divs/eh/fish/eating/index.html

1-800-657-3808

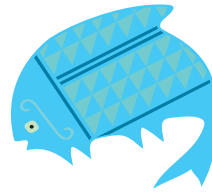
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Animals such as otters and mink, birds like bald eagles, osprey, diving ducks, Minnesota's State bird, the loon, and reptiles like snapping turtle are at risk from eating methyl-mercury, dioxin and PCB contaminated fish.

*Indigenous Women's Mercury Investigation
is a project of the
North American Water Office (NAWO)*

The Food Value



of
Fish

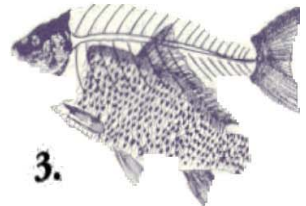
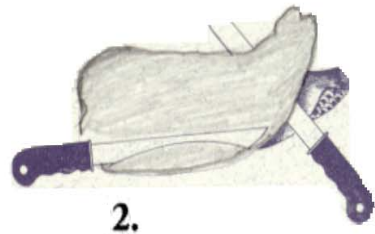
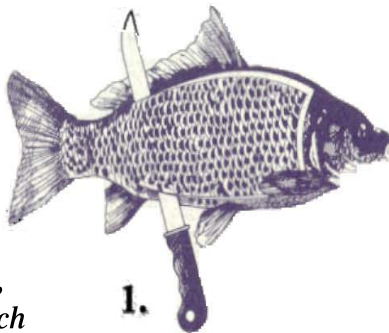
Protein is basic to the diet. It can be broken down into amino acids which are essential for the growth and repair of body tissue. Whereas some proteins are incomplete and must be supplemented with other protein foods, fish proteins are complete, containing all the amino acids required by the body. A four-ounce serving can contain from thirty to fifty percent of the body's daily requirement of protein.

Fish are also a valuable source of vitamins, which are necessary for the body's functions. Fish liver oil is an exceptional source of vitamins A and D. Vitamin A is necessary for healthy skin and development of bones. Vitamin D plays an important part in the body's use of calcium, a mineral vital for sound teeth and bones. All fish contain several of the B complex vitamins necessary for many of the body's processes, especially digestion and the nervous system.

POLYCHLORINATED BIPHENOLS (PCBs)

How to Clean Fish to Reduce Your Exposure to PCBs:

- 1. Cut along the bone to get just the meat and skin.*
- 2. Fat is under the skin. You cannot see fat in the meat. Cut off the skin with the fat, and fatty meat on the stomach of fish.*
- 3. Use only the meat. Throw away all other parts of the fish. Do not make fish head soup with these parts. They are the most contaminated.*



NAWO is a member of the

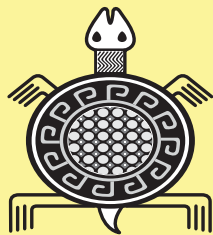


PCBs are synthetic chemicals that were originally used as coolants and lubricators in transformers and other electrical equipment. They are usually colorless or light yellow.. The type of PCBs that tend to build up in fish, turtle, and other animals and bind to sediments in our water bodies happen to be the most cancer causing components of all the PCBs mixtures.

HEALTH EFFECTS of PCBs

exposure include


- rare liver cancers and
- malignant melanomas



Other non-cancer

effects include

- ***immune system effects*** (such as increased susceptibility to pneumonia and viral infections),
- ***reproductive effects*** (low birth weight, reduced conception rate, reduced sperm counts in animals),
- ***neurological effects*** (deficits in visual recognition, short term memory and learning),
- ***endocrine effects*** (thyroid hormone levels are altered and are critical to normal growth and development in animals and humans, furthermore high blood pressure, cholesterol and triglycerides are also elevated.)



WHAT
IS
DIOXIN?

Dioxin is formed as an unintentional by-product of many industrial processes involving chlorine such as waste incineration, chemical and pesticide manufacturing and pulp and paper bleaching.

Dioxin is formed by burning chlorine-based chemical compounds with hydrocarbons. The major source of dioxin in the environment comes from waste-burning incinerators of various sorts and also from backyard burn-barrels. Dioxin pollution is also affiliated with paper mills which use chlorine bleaching in their process and with the production of Polyvinyl Chloride (PVC) plastics and with the production of certain chlorinated chemicals (like many pesticides).

DOES DIOXIN
CAUSE
CANCER?


Yes.

The United States Environmental Protection Agency's

Dioxin Reassessment: Draft Final
Exposure & Health Document
(September 2000)

confirmed that dioxin is a cancer hazard to people.

The International Agency for Research on Cancer (IARC) which is part of the World Health Organization, published their research on dioxins and furans and announced on February 14, 1997, that the most potent dioxin, 2,3,7,8-TCDD, is now considered a Class I or known human carcinogen (IARC Monographs, Volume 69).



If you're eating the typical North American diet, this is where you are getting your dioxin from:

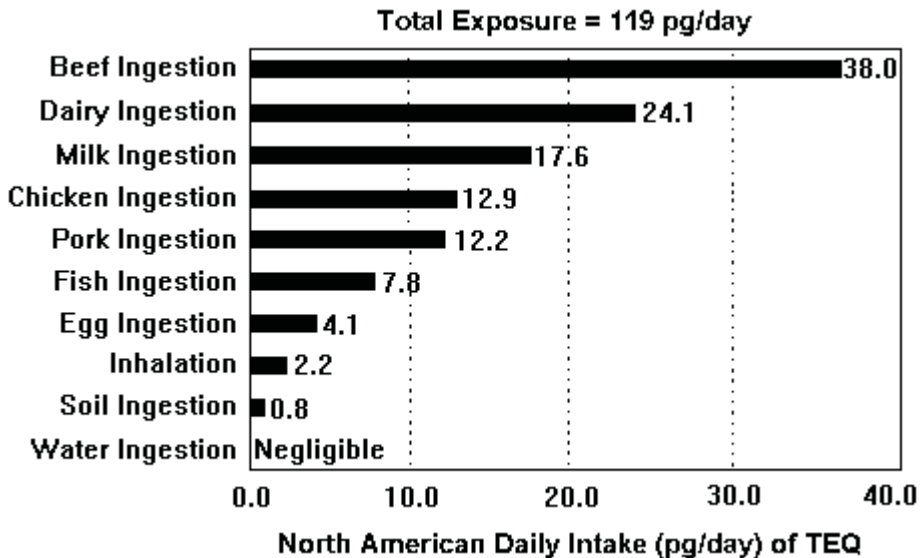
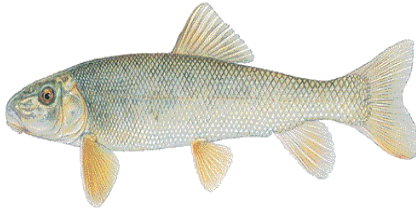


Chart from [EPA Dioxin Reassessment Summary 4/94 - Vol. 1, p. 37](#)
(Figure II-5. Background TEQ exposures for North America by pathway)

[A TEQ is a dioxin Toxic Equivalent, calculated by looking at all toxic dioxins and furans and measuring them in terms of the most toxic form of dioxin, 2,3,7,8-TCDD. This means that some dioxins/furans might only count as half a TEQ if it's half as toxic as 2,3,7,8-TCDD.]

Source: Dioxin Homepage <http://www.ejnet.org/dioxin>, and
Agency for Toxic Substance and Disease Registry 1-888-422-8737

WHITE SUCKER



COMMON CARP



CATFISH



WHITE BASS



BLACK BUFFALO FISH



DO NOT
EAT
THESE FISH
FROM THE
MINNESOTA
AND
MISSISSIPPI
RIVERS
THEY ARE
MERCURY,
DIOXIN, &
PCBs
POISONED.

Fish images used by permission MNDNR