

Eating Fish Maximizing Benefits and Minimizing Risks

As part of the Great Lakes Restorative Initiative, the Environmental Protection Agency has provided funds to Michigan State University to educate health care professionals on advice to provide patients on maximizing benefits of eating omega-3 fats while minimizing the ingestion of potentially harmful pollutants. This information pertains to both fish caught in the Great Lakes and their watersheds, as well as store bought fish.

In 2006, the American Heart Association published Recommendations for Cardiovascular Disease Risk Reduction that included “**Consume fish, especially oily fish, at least twice a week**”(Circulation 2006;114: 82-96). Table 1 shows a list of oily fish. This recommendation was put forward so as to increase the ingestion of two omega-3 fatty acids, docosahexaenoic and eicosapentaenoic. Table 2 summarizes the benefits which can be obtained from ingesting fish or fish oil. Note only the lowering of triglycerides requires ingestion of the FDA approved high dose fish oil pill, Lovaza, four times a day. The other benefits are associated with eating fish twice a week or a daily fish oil supplement.

Table 1. Oily Fish
Anchovies
Carp
Eel
Herring
Kipper
Mackerel
Orange Roughy
Salmon
Sardines
Trout
Tuna (fresh only)

Table 2. Summary of Cardiovascular Benefits of Ingesting Fish/Fish Oil
Primary Prevention
19 % Reduction in CV Events (0.5gm/day)
S/P Myocardial Infraction
23% Reduction (0.5 gm/day)
Arrhythmias
30% Reduction Risk of Atrial Fib (0.5 gm/day)
Congestive Heart Failure
5-10% Reduction Mortality (0.5 gm/day)
Triglycerides
30-40% Reduction (FDA Approved 4 gm/day)

Eating Fish, continued...

The contaminants in fish are mercury and chlorinated hydrocarbons (i.e. DDT, dioxin, PCBs). Mercury is in the flesh of the fish and increases with the size and age of the fish. Four fish should never be eaten because of their mercury content, king mackerel, shark, swordfish and tile fish. Figure 1 shows the best fish to eat to obtain the most omega-3 fatty acids while ingesting the least mercury (salmon, herring and trout).

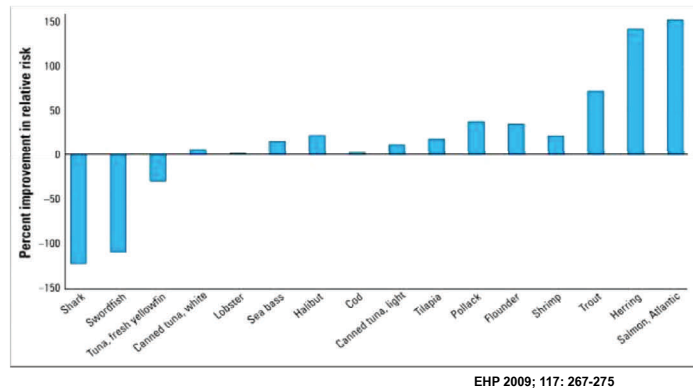
Chlorinated hydrocarbons in the fatty part of fish are higher in certain rivers and lakes. People can reduce their consumption of these contaminants by selecting where they catch fish and during preparation and cooking by trimming off the fat, and baking, boiling or grilling the fish. The Michigan Department of Community Health (MDCH) puts out guidelines on how many and what type of fish to eat, by watershed: www.michigan.gov/documents/FishAdvisory03_67354_7.pdf. Since children are at the highest risk of the neurologic effects of mercury and the potential long term carcinogenic risk of chlorinated hydrocarbons, recommendations are stricter for children and women of child bearing age who will pass the contaminants to the fetus.

MDCH has a useful summary brochure on how many and what kind of fish to eat (Figure 2). This brochure assigns different types of fish from one to eight points and indicates someone should not eat more than eight points per month. The brochure is a variable at: www.michigan.gov/mdch/0,1607,7-132-54783_54784_54785---,00.html.

The medical literature does not support a clear difference between wild vs. farm fish in terms of benefits or risks.

Fish oil supplements do not contain mercury. Chlorinated hydrocarbons accumulate in fat but one can select fish oil less likely to have chlorinated hydrocarbons: www.edf.org/page.cfm?tagID=16536.

Figure 1. Estimated Net Effect of Mercury and Fish Oils on Cardiovascular Risk, Two 6-oz Fish Meals per Week.



Mercury Advisory for Store-bought or Restaurant Fish

Going to the store or out to eat?

Fish are grouped and assigned points based on the amount of mercury in 6 ounces of fish (one meal). Fish with more mercury get more points.

The lower the score, the better the fish is for you to eat. Eat no more than 8 points of fish meals per month...

EAT
no more than... **8 points** per month

1 Point

Anchovies	Pollock
Catfish (farm-raised)	Salmon* (canned, frozen, fresh)
Crab	Sardines
Crawfish	Scallops
Flatfish (flounder, sole)	Shrimp
Herring*	Squid
Mullet	Tilapia
Oysters	Trout* (freshwater)
Perch* (ocean or freshwater)	Whitefish*

2 Points

Cod	Mahi mahi
Freshwater Drum* (aka Sheepshead)	Snapper
Jack smelt	Tuna (canned light)

4 Points

Bass* (sea, striped, rockfish)	Scorpion fish
Bluefish	Tuna (Albacore, canned white)
Hallibut	Tuna (fresh, frozen)
Lobster	Weakfish (sea trout)
Sablefish	

8 Points

Grouper	Marlin
Mackerel	Orange Roughy

Do not eat these fish:
Shark, Swordfish, Tilefish, King Mackerel

* This chart is based on FDA fish fillet mercury data.
* Advice to eat no more than 8 points is good for everyone, including pregnant women & children.
* If you catch these fish in Michigan, please see the Michigan Fish Advisory at www.michigan.gov/eatsafefish.

There are many resources on the web to obtain additional information about safe fish consumption. These include sites for continuing medical education and brochures for patients. A summary of such sites are:

Patient Resources

EPA Fish Advisories

http://water.epa.gov/scitech/swguidance/fishshellfish/fishadvisories/advisories_index.cfm

FDA Mercury in Fish and Shellfish – Consumer Guide

<http://www.fda.gov/Food/ResourcesForYou/Consumers/ucm110591.htm>

MDCH Guidelines for Eating Michigan Fish and Wild Game

http://www.michigan.gov/mdch/0,1607,7-132-54783_54784_54785---,00.html

Michigan 2010 Fish Advisory –Recreational Caught Fish

http://www.michigan.gov/documents/FishAdvisory03_67354_7.pdf

Statewide Mercury Advisory –Recreational Caught Fish

http://www.michigan.gov/documents/mdch/Statewide_Mercury_Advisory_Fact_Sheet_2010-07_327066_7.pdf

Mercury Advisory – Store Caught Fish – Consumer Guide

http://www.michigan.gov/documents/family_fish_166020_7.pdf

Evaluation of Contaminants of Fish Oils

www.edf.org/page.cfm?tagID=16536

Continuing Medical Education

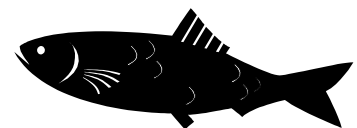
Association of Reproductive Health Professionals

<http://www.arhp.org/publications-and-resources/clinical-proceedings/RHE>

Fish Facts for Health Professional: Methylmercury Exposure and Health Effects and Four Web-Based Modules

www.fish-facts.org

In summary, the data strongly supports that the regular ingestion of fish or fish oil has cardiovascular benefits. There are multiple resources to select the best fish to eat to obtain the beneficial omega-3 fatty acids while minimizing exposure to mercury and chlorinated hydrocarbon contaminants. All patients need to know about the benefits of eating fish and which fish to avoid. Conveying information about which fish to avoid to the parents of children and women of child bearing age has the highest priority.



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S Remember to report all cases of occupational disease!

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