In this issue, information about the health benefits of eating fish, whitefish in particular, has been collected. There is a growing appreciation for fish in the diet. What was once *“brain food”* has been found helpful in reducing heart disease risk, stroke risk, even artery damage from smoking. Especially interesting is exciting new research just coming out about Omega-3’s action on autoimmune diseases and even depression and cancer (see page 6).

Also included are two articles that address a health risk — contaminants such as mercury in fish. Recent testing results have found mercury remarkably low in Lake Superior whitefish, and contaminants at a 10-year low.

Whitefish is a mild flaky fish that lends itself to almost any preparation. It can be beamed, poached, baked, grilled, smoked, boiled, even made into a pie and lends itself to many different cuisines. A selection of recipes is included, along with tips for cleaning, filleting and storing your newfound treasure.

Where can you get tribal Great Lakes fish products? Many fishers sell to wholesalers who in turn sell to the public. Other fishers run their own businesses. Just ask around your community or the community you are visiting to locate tribal fish. Even if you can’t get tribal fish, you can still ask where your fish is from.

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**American Heart Association recommends two meals of fish per week**

Healthy people should eat omega-3 fatty acids from fish and plant sources to protect their hearts, according to updated American Heart Association recommendations published in the Nov. 18, 2002, Journal of the American Heart Association.

*“Omega-3 fatty acids make the blood less likely to form clots that cause heart attack and protect against irregular heartbeat that cause sudden cardiac death. Since 2000, the American Heart Association’s dietary guidelines have recommended that healthy adults eat at least two servings of fish per week, particularly fish such as mackerel, lake trout, herring, sardines, albacore tuna and salmon. These fish contain two omega-3 fatty acids — eicosapentaenoic and docosahexaenoic acids (EPA and DHA). A third kind, alpha-linolenic acid, is less potent. It comes from soybeans, canola, walnut and flaxseed and oils made from those beans, nuts and seeds. Depending on their stage of life, consumers need to be aware of both the benefits and risks of eating fish. Children and pregnant and nursing women may be at increased risk of exposure to excessive mercury from fish but also are generally at low risk for CVD. Thus, avoiding potentially contaminated fish is a higher priority for these groups. For middle-aged and older men, and postmenopausal women, the benefits of eating fish far outweigh the risks within the established guidelines.

Although the mechanisms responsible for omega-3 fatty acids’ reduction of CVD risk are still being studied, research has shown: — Decreased risk of sudden death and arrhythmia. — Decreased thrombosis (blood clot). — Decreased triglyceride levels. — Decreased growth of atherosclerotic plaque. — Improved arterial health. — Lower blood pressure."

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**Great Lakes Whitefish Remarkably Low In Mercury**

There has been a lot of talk in the news lately about the presence of mercury in fish. Recent newspaper articles have reported that levels of mercury in swordfish, shark, tuna and other ocean fish have levels of mercury that sometimes exceed the levels set by the U.S. Food and Drug Administration (FDA).

Whitefish from our northern waters are significantly lower in mercury than many ocean fish. This fact, coupled with the fact that they are especially high in omega-3 fatty acids, makes whitefish an ideal choice for a healthy diet.

Fishers and their customers should know that since 1991 the Chippewa Ottawa Resource Authority (CORA) has been monitoring mercury in fish caught by tribal commercial fishers. Fish collected from Lake Huron, Lake Michigan and Lake Superior are tested for a variety of chemicals, including mercury, in an independent government lab.

Whitefish, in particular, show levels of mercury well below the FDA’s “action level” of 1 part per million. None of the whitefish sampled by ITFAP in the 10 years since testing began have exceeded 0.5 parts per million. In fact, out of a total of 120 individual whitefish tested, the highest level of mercury detected was 0.14 parts per million with the average being 0.04 parts per million — almost 100 times less than the FDA action level!

In contrast, up to 10 percent of canned tuna sampled had levels of mercury in excess of 0.5 parts per million, while a third of swordfish and shark had levels of mercury in excess of the FDA’s action level of 1 part per million, according to several sources (see citations below).

Although newspaper headlines can instill uncertainty in many people, health experts continue to stress that fish are an important part of a balanced diet. Studies continue to show that certain nutrients in fish, especially omega-3 fatty acids, help to lower cholesterol and blood pressure and reduce the risk of heart attack and stroke.

For more information on CORA’s fish contamination monitoring program, contact Mike Ripley at 906-632-0072.


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**Testing of Lake Superior fish show lowest levels of contaminants**

Sault Ste. Marie, Mich. — Results from testing of Lake Superior whitefish and lake trout show the lowest levels in the past decade. The fish tested were collected from commercial catches in the Whitefish Bay area and analyzed at an independent laboratory.

The fish are tested as part of a long term fish contaminant monitoring program conducted by the Inter-Tribal Fisheries and Assessment Program (ITFAP) in order to determine contaminant levels in commercially caught fish. The results of these tests are then compared to levels of contaminants determined to be safe by various government agencies.

ITFAP began testing commercially harvested fish in 1991 and this past year’s results are the lowest levels seen in the 10 years since the program began. Lake Superior fish were tested for a wide range of contaminants including mercury, PCBs, Dioxins and pesticides such as DDT.

All fish were well below the guidelines for commercial fish issued by the U.S. Food and Drug Administration and below the Michigan Department of Public Health’s guidelines for consumption of sport fish by the general public. The state also issues special guidelines for consumption by pregnant women, women of childbearing age and children.

Even under these special, more restrictive guidelines, these test results indicate that pregnant women can eat as much Lake Superior Whitefish as they want provided that it is prepared with the skin and visible fat removed.

The Lake Superior fish tested were remarkably low in mercury especially when compared to levels of mercury found in tuna and swordfish. Levels of pesticides, such as DDT, which was banned in the United States in the 1970s, are also remarkably low in Lake Superior fish. Contaminant levels in fish from all of the Great Lakes have declined dramatically since the 1970s when regulations were put in place to reduce pollution.

These results are encouraging for many people who enjoy eating Great Lakes fish, especially since studies show that most Americans eat a diet high in saturated animal fats. Studies show that Americans could dramatically reduce their risk of heart attack and stroke by switching to a more lean protein source such as properly prepared fish. Other studies also show that a different type of fat, omega-3 fatty acids, may actually reduce the risk of cancer.

Great Lakes fish are especially high in omega-3 fatty acids in comparison to other foods.

For more information, contact Mike Ripley at (906) 632-0072.
Freshwater fish is a good source of Omega-3 fatty acids. Recent studies suggest that eating 0.5 to 1 gram of fish oil daily reduces the risk of heart disease death in middle-aged men by a whopping 40 percent. The star of the show is Omega-3 fatty acids because of its significant role in reducing the risk of heart disease.

Contrary to popular belief, not only saltwater fish offer these benefits. Oil from both freshwater and saltwater fish is the best food source of Omega-3 fatty acids. In fact, a study during the 90's, Lake Superior Study also found that Lake Superior chub, lean lake trout, fat lake trout (siceweat), smelt, whitefish, and burbot (loesch) are all good sources of the fatty acids. Omega-3 fatty acids are the sort of fat found in flax and canola oil. Omega-3 fatty acids reduce heart risk by reducing platelet activity (blood clotting). This works in two ways. Overactive platelet activity may help to accelerate the build up of plaque on the arteries. Further, blood clots formed by blood platelets may become stuck in a plaque-narrowed artery and trigger a heart attack.

In a recent study of Lake Superior fish, some species were also found to be an excellent source of monounsaturated fats, like the fat found in olive oil. This sort of fat reduces blood cholesterol.

A healthy diet also includes some Omega-6 fatty acids, a polyunsaturated fat not as beneficial as Omega-3 fatty acids. This is the sort of fat found in safflower or soybean oil. Although Omega-6 fatty acids reduce blood cholesterol, they can increase platelet activity.

Since reduction of clotting is the key step to preventing heart disease, food scientists recommend that individuals eat less Omega-6 fatty acids and more Omega-3 fatty acids.

Researchers found that vitamin C and taurine, an amino acid in fish, reversed abnormal blood vessel dysfunction by flow mediated dilation which takes ultrasound images of blood vessel diameter in the arm after a tourniquet is placed on the forearm. Greater diameter after flow mediated dilation assessment indicates good endothelial function. The researchers reported that taurine restored normal vessel function according to flow mediated dilation measurements.

Amino acid in fish may help repair damage from smoking

Researchers found that vitamin C and taurine, an amino acid in fish, reversed abnormal blood vessel response associated with cigarette smoking, according to a Jan. 7 American Heart Association release.

Taurine is found in many foods but is most abundant in fish.

Taurine is present even in mild, white fish, not just fatty fish. The taurine supplement used in the study is equivalent to that found in one serving of fish.

“When blood vessels are exposed to cigarette smoke it causes the vessels to behave like a rigid pipe rather than a flexible tube, thus the vessels don’t dilate in response to increased blood flow,” said David J. Boucher-Hayes, M.D., senior author of the taurine study and professor of surgery at the Royal College of Surgeons in Ireland, Beaumont Hospital, Dublin.

This is a condition called endothelial dysfunction. Endothelial dysfunction is one of the earliest signs of the atherosclerosis, which is a major cause of heart attacks and stroke.

Boucher-Hayes and colleagues recruited 15 healthy smokers aged 20 to 37 and 15 healthy non-smoking volunteers. The smokers were given either two grams per day of vitamin C for five days or 1.5 grams per day of taurine. Smokers then waited for a two-week "wash-out" period and switched therapies for five more days.

Researchers assessed blood vessel functioning by flow mediated dilation which takes ultrasound images of blood vessel diameter in the arm after a tourniquet is placed on the forearm. Greater diameter after flow mediated dilation assessment indicates good endothelial function. The researchers reported that taurine restored normal vessel function according to flow mediated dilation measurements.

Keep in mind we do need some Omega-6 fatty acids: it does help lower blood cholesterol, and also reduces lipoproteins to help prevent atherosclerosis and heart disease.

It is best to eat a variety of oils in moderate quantities, with a diet heavier on Omega-3 fatty acids than other fats. The best way to get these oils is to eat two meals per week of fish rich in Omega-3 fatty acids, prepared without additional oil.

Fish that is baked, broiled, or grilled is best. The health benefits of fish are greatly reduced by bathing and frying the fish.

So, many commercial species of Great Lakes fish offer the health benefits of Omega-3 fatty acids, monounsaturated oils, and Omega-6 fatty acids, both of which are needed for a healthy diet.

The information in this article about fish oil and human health is from two publications written by Paul B. Addis, Ph.D, a food scientist with Minnesota extension Service, Department of Food Science and Nutrition, University of Minnesota.

FRESH FISH 101

Fish is a highly perishable foods. If your shopping trip is more than an hour, pack your fish in a cooler.

Indicators of fresh fish include eyes which are clear and bulge a little. Whole fish and fillets should have firm, shiny skin. The fish should smell fresh and mild, not fishy. All fresh seafood should be kept at 32 °F and should feel cold to the touch.

Keep seafood cold before it is prepared. Store it in the coldest part of the refrigerator at a temperature close to 32 °F. Fish kept at 40 °F will lose quality faster. Fish can be stored with ice in the refrigerator. Wrap dressed fish or fillets in a moisture-proof paper or plastic wrap. Fish that is not prepackaged should be washed under cold, running water after patting dry with an absorbent paper towel prior to wrapping. In general you should use fresh or defrosted seafood in one or two days.

Thaw fish in the refrigerator, a 1-pound package should thaw in about 24 hours. You can also thaw it under cold running water or place it in cold water changed every 30 minutes or in your microwave followed by cooking.

Wash your hands before preparing seafood or other foods and avoid cross contamination of raw fish with other foods and thoroughly clean utensils and food preparation surfaces.

FISH PREPARATION 101

Grilling and barbecuing

If using whole fish, cut gashes through the skin to allow the heat to penetrate. Brush with oil, butter or marinade to keep the fish moist during cooking. Place over a preheated grill or barbecue, or under a salemander. Place 2 to 4 inches from the source of heat. Cook 4 to 8 minutes per 1/2 inch thickness of fillet; 6 minutes for 3/4 inch; 9 minutes for 1 inch and 11 minutes for 1 1/2 inch.

Poaching

Poached fish is cooked in a seasoned liquid held at just below boiling point. The simmering temperature for water is usually 200°F.

Fillets should be placed in a simmering liquid. This effectively “seals” the fish and stops the juices from escaping and coagulating into a white coating on the cut surface of the fish. Fish may be shallow or deep poached. When fish is shallow poached the cooking liquid barely covers the fish and it is usually used to make a sauce.

Times given below are for cuts of fish placed in hot poaching liquid: 8 minutes for 1/2 inch thickness of fillet; 10 minutes for 3/4 inch; 12 minutes for 1 inch and 13 minutes for 1 1/2 inch.

Steaming

Place the seasoned fish in a perforated steamer or on a heatproof plate over a saucepan of gently boiling water. The fish must be covered tightly during cooking. Time: 3 minutes for 1/2 inch thickness of fillet; 7 minutes for 3/4 inch; 11 minutes for 1 inch and 14 minutes for 1 1/2 inch.

Baking

Dry: Score the surface of the fish with a sharp knife and place in a well-oiled dish. Bake at 450°F until desired. Always baste the fish throughout cooking, until the fish is browned and tender. Bake at 350°F.

In liquid: Cover with liquid such as tomato, milk or stock-based mixture. Cook at 190 degrees Celsius using the times listed below.

Foiling baking: Cut the foil or greaseproof paper large enough to wrap individual fillets, steaks or whole fish. (If you wish, unseal the fish briefly before placing it on the paper foil). Season the fish with salt and pepper, fresh herbs, onion, tomato, lemon, orange or mushrooms. Grease the foil and bring the edges of the foil or paper together and fold tightly. You can also brush the paper with lightly beaten egg white to make sure the package is air tight. Bake at 425°F using times as below.

Fresh fish: 8 minutes for 1/2 inch thickness of fillet, 11 minutes for 3/4 inches, 15 minutes for 1 inch, and 20 minutes for 1 1/2 inches.

Cooking Frozen Fish

For best results, frozen fish should be cooked while it is still frozen or icy (before it starts to drip). This poses no real problem as fish can be cooked from a frozen state by adapting the recipe slightly and cooking for longer at a slightly lower temperature. As a general “rule of thumb” allow an extra 10 minutes for each 1 inch of thickness of fillet.
**Whitefish Recipes Old and New**

Whitefish is a mild, tasty fish that holds together well. It can be steamed, poached, boiled and baked. It can be made into soups, chowders, salads, spreads. It is good fresh, smoked, even powdered. A local favorite is whitefish sausage, made with lots of pepper. Unlike whitefish, making a delicious fish fry, frying is not recommended in order to realize all the health benefits.

**Domers: fisherman's special**

In the old days, the fishing boats were steam powered. For lunch, the fishermen used to make fish sandwiches of whitefish or walleye, dressed with lots of pepper. Whitefish makes a delicious fish fry. Frying is not recommended in order to realize all the health benefits.

**Wawa Whitefish: Making domers at home**

1 whole whitefish or walleye, dressed
1 tsp salt
1/2 tsp black pepper
1/2 tsp cayenne pepper
2-1/2 tsp salt
1 tbsp paprika

**Powdered fish**

Anishinabe living in the bush did not have access to refrigerators. They found ways to preserve their catch by smoking or even powdering their fish. First, a stand was constructed using green wood. The stand had a series of parallel sticks to hold the fish in place and was placed over a low fire.

Fish were gutted and rinsed. They were not beheaded or boned. A cut was made from the back of the head down through the tail. In this way, the fish could hang on the sticks over the fire. The fish were smoked all though the day and night. A lot of the fat dripped down into the fire.

When ready, the fish would be taken off, skinned and beheaded. When iron skillets became available, Anishinabe used them. The remaining flesh and bones were placed in the heavy skillet and reduced to a powder (including the bones) by pushing the contents back and forth while holding the skillet over the fire. A certain amount of patience.

**Whitefish Baked with Fiddlehead Ferns**

1/2 c White wine
2 tbsp Dijon mustard
3/4 lb fiddlehead ferns or asparagus
1 md onion; finely diced
2 tbsp unsalted butter

**Russian Pickled Whitefish**

4 pieces of whitefish fillet (about 6 oz each)
1 onion, thinly sliced
1 tbsp mustard
1 tsp whole coriander seed
1 tsp minced garlic
1 c white wine
1/4 c vinegar
1/4 c water
2 tbsp chopped fresh dill
salt and pepper — to taste

**Whitefish Chowder**

2 tbsp finely diced ham
1 bunch green onions, chopped
3 medium potatoes, peeled & diced
1 tsp salt
1/8 tsp white pepper
1 c water
1 qt milk, scalded
1 lb. Minced whitefish, thawed
4 tbsp soft butter
4 tbsp flour
1 c cream

**Whitefish Salad**

2 lb smoked whitefish
2-1/2 stalks celery, strings removed
1 c sour cream; approximately
1/2 c whitefish mayonnaise, heapingly ground black pepper
1 tsp snipped fresh dill *
1 tsp chopped parsley +

**Irish Fish Pie**

(also know as Cod Cobbler)
1 1/2 lb filets of cod or other white fish
2 oz butter
2 oz flour
1/2 liter milk
3 oz grated cheese
Scone topping
1 c flour
2 oz grated cheese
2 oz butter
1 1/2 baking powder
1 pinch salt
1 egg yolk
milk

**Smoked Whitefish Salad**

1 pk (8 oz) cream cheese
1/2 lb smoked whitefish
2 tbsp green onions; finely chopped
1 tsp fresh dill; finely chopped
1 tsp mayonnaise, homemade

**Mayo-based spread**

Smoked whitefish is also good mixed very well with mayonnaise, finely diced onion and garlic. Some people like to indulge a little dill relish or chopped dill pickles. (A tip given to me by Lothrop Fisheries. — J. Dale)

Some of the above recipes came from http://www.recipesource.com. Check out this site for other fish recipes as well as Native American recipes that have been submitted to the site.
Eating fish can significantly reduce women’s risk of stroke

Eating fish can significantly reduce a woman’s risk of the most common type of stroke, according to a study released in 2001. The study stated that nearly 80,000 women found that eating fish was linked to reductions in the risk of ischemic, or clot-related, strokes, which account for about 83 percent of all strokes. Frequent fish eaters — 4 ounces of fish two to four times weekly cut their risk of ischemic stroke by 48 percent. Slightly higher risk reductions were found in women who ate fish five or more times weekly. Slight risk reductions were also found even in those who ate fish once a week or less.

Omega-3 fatty acids, found in most fish, have been shown to lower levels of blood fats linked to cardiovascular disease and to help keep blood from clotting. Another study released in 2001 by the Food and Drug Administration said pregnant women and those who might become pregnant should not eat four types of fish — shark, swordfish, king mackerel and tilefish — because they could contain enough mercury to hurt a fetus’ developing brain.

Fish is widely considered part of a healthy diet. But some types of fish can harbor high amounts of mercury, an element found naturally in the environment and also a pollutant.

Omega-3 fatty acids may cut prostate cancer risk in half

By EMMA ROSS AP Medical Writer
LONDON (AP) — Eating even moderate amounts of fish rich in Omega-3 fatty acids can cut the risk of prostate cancer in half, research suggests.

Omega-3 fatty acids, plentiful in dark, oily fish, are known to fight heart disease. They also have shown promise in protecting against cancers of the colon, rectum and ovary.

Previous studies have shown fatty fish oils can cut the risk of prostate cancer cells in laboratory dishes and in animals. In another study, prostate cancer was found less frequently in men who had high levels of fatty acids in their blood.

So, now a study published in 2001 in The Lancet Medical Journal, found that Swedish men who ate greasy fish only occasionally or not at all were twice as likely to develop prostate cancer as those who made it a moderate or large part of their diet.

Dr. Regina G. Ziegler, a nutritional epidemiologist at the National Cancer Institute, was cautious about the Swedish findings. The study was financed by the Swedish Cancer Society, The John D. and Catherine T. MacArthur Foundation and the Swedish Council for Planning and Coordination of Research.

“It’s a provocative study,” said Ziegler, who was not involved with the research.

“But there could be other dietary patterns that go along with eating very little fish that could be at work here.”

People who seldom or never eat fish tend to substitute with more red meat, Ziegler said, and scientists believe animal fat — butter, cream, beef, pork and processed meats — may encourage prostate cancer.

“If the fish is really protective, or is red meat causing the cancer?” Ziegler cautioned.

Also, Swedish men eat a lot of oily fish, so there isn’t many in the study group who ate very little of it. That means that although the study involved thousands of men, the effect seen was driven by a small number of men with unusual levels of fish consumption.

With such a small sample, it is difficult to rule out the possibility that it was not the fish itself, but something else about the men who were not big fish eaters, Ziegler said.

Prostate cancer strikes about 21 out of every 100,000 men worldwide, according to the World Health Organization. It is most common in North America and northwestern Europe.

The study involved 6,272 men followed for about 30 years. During the study, 466 of them were diagnosed with prostate cancer, on average when they were 76 years old.

The link between the fatty fish and a reduced frequency of prostate cancer was even stronger after the results were adjusted to account for the influence of other eating habits, a genetic predisposition to prostate cancer and smoking, drinking and exercise habits, the study said.

“We’re only talking about a moderate intake. This would be about one or maybe three servings a week. That is very manageable,” said one of the researchers, Alicja Wolk, professor of epidemiology and nutrition at the Karolinska Institute in Stockholm, Sweden. “What is also important is that the fatty fish is not the less you have to eat to get the same benefit.”


Origins of the whitefish

The Anishinabe have more than one story about the creation of the whitefish. In all that I have heard, the whitefish came from the brain of a woman. Sometimes she falls and breaks her head open in her own folly; her life is put to better use than she made of it by creation of the Crane Clan, and the oldest with the formation of the Great Lakes. Here is one of the oldest, of which I know only a fragment.

Long ago, Nanabush took the head of a bad woman and cracked it on the ice. The Great Lakes waters held back by the ice pack were freed to fill the basin, taking with them the brains of the woman, which became the whitefish, filling the Great Lakes with its bounty.

— J. Dale, Editor

New research on Omega-3 Fatty Acids suggests it is helpful for inflammation and autoimmune diseases

In December 2002, the Center for Genetics, Nutrition and Health, Washington, D.C. reported that omega-3 fatty acids have anti-inflammatory properties and might be useful in the management of inflammatory and autoimmune diseases.

The report found omega-3 as the most potent of the fatty acids, particularly omega-3 fatty acids from fish. The report said that diseases omega-3 fatty acids might help — coronary heart disease, major depression, aging and cancer, arthritis, Crohn’s disease, ulcerative colitis and lupus erythematosus — all have something in common. They are all are characterized by an increased level of interleukin 1 (IL-1), a proinflammation cytokine.

There have been a number of clinical trials assessing the benefits of dietary supplementation with fish oils in several inflammatory and autoimmune diseases in humans, said the report, including rheumatoid arthritis, Crohn’s disease, ulcerative colitis, psoriasis, lupus erythematosus, multiple sclerosis and migraine headaches.

Many of the placebo-controlled trials of fish oil in chronic inflammatory diseases reveal significant benefit, including decreased disease activity and a lowered use of anti-inflammatory drugs, said the Washington report.

In another study published in "Prostaglandins, Leukotrienes and Essential Fatty Acids," researchers found two reasons that omega-3 fatty acids decrease inflammation in rheumatoid arthritis: the ability to modulate the immune system and the ability to decrease the inflammatory response through the production of hormone-like compounds called prostaglandins.


Turn your diet around with fish

Americans eat 17 times as much Omega-6 fatty acids as they eat Omega-3 fatty acids, which is very unhealthy. Usually the Omega-6 fatty acid is eaten in the form of vegetable oils. A Wu paper presented at five times as much Omega-3 fatty acids as Omega-6 fatty acids. One of the best ways to get Omega-3 fatty acids into the diet is to eat fish twice a week without using additional oil. Many freshwater fish, such as the bass, trout, bass, lake trout, yellow perch, lake trout (tisonew), and whitefish, are especially high in Omega-3 fatty acids.