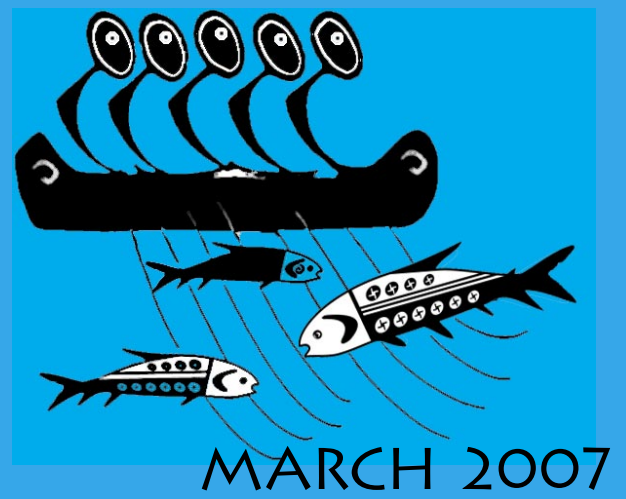


For the Seventh Generation

PRESERVING THE RESOURCE



Mukwa giizis — Ziisibaakadake giizis • Vol. 10 No. 2 • Bimonthly Journal of the Chippewa Ottawa Resource Authority

GREAT LAKES WHITEFISH SENSORY ANALYSIS HELPS POSITION ITS NATIONAL MARKETABILITY

Taste tests show 2 to 1 preference over Canadian inland whitefish

**By Ron Kinnunen,
Michigan Sea Grant
Extension**

Michigan Sea Grant Extension has been working on a Great Lakes whitefish marketing study with support from a Fisheries Extension Enhancement Grant through the National Sea Grant Program. One part of this project included sensory analysis of Great Lakes whitefish to help better position this important commercial fish in the marketplace. With guidance from the Lake Whitefish Marketing Steering Committee, it was determined that fresh Great Lakes whitefish would be compared to fresh inland lake whitefish marketed by the Freshwater Fish Marketing Corporation of Canada; frozen Great Lakes whitefish would be compared to fresh Great Lakes whitefish; and frozen Great Lakes whitefish would be compared to frozen farmed catfish, tilapia, and Atlantic salmon.

The Lake Whitefish Marketing Steering Committee is made up of state and tribal commercial fishers/processors, and representatives from the Great Lakes Indian Fish and Wildlife Commission and Chippewa Ottawa Resource Authority.

The research for this project was carried out at the Michigan State University Department of Food Science and Human Nutrition Sensory Evaluation Laboratory that runs under the direction of Janice Harte. Ron Kinnunen and Chuck Pistis, who are both with Michigan Sea Grant Extension, worked with Janice Harte and her graduate students to conduct the Great Lakes whitefish sensory analysis. The consumer panelists that participated in the product testing ranged from 113 to 115 for each of the three sensory analysis tests. For all the tests, 0.5 ounce samples



Photo used courtesy Michigan SeaGrant

Half-ounce samples of fish fillets are prepared with no seasonings and rated by panelists for taste, appearance, and texture. Above, Chuck Pistis holds a tray of fish ready to be sampled.



Photo used courtesy Michigan SeaGrant

There were 113 to 115 panelists rating products in each of the sensory tests.

were prepared from the loin section of the fish fillets and they were cooked in a microwave without any additional seasoning.

In the first sensory analysis test fresh northern Lake Huron lake whitefish was compared to fresh inland lake whitefish from Lake Winnipeg. The consumer panel preferred Great Lakes whitefish two to one over the Lake Winnipeg lake whitefish in the attributes of cooked appearance, texture, and overall acceptability.

The second sensory analysis test compared fresh Great Lakes whitefish to Great Lakes whitefish that

had been frozen for 1 and 4 months. Two side-by-side frozen fillets were stored in 3 mm vacuum sealed bags. During the freezing process, all vacuum packed fillets were spread out on racks in the freezer to freeze evenly and quickly. The freezer was kept at -10 °F to -20 °F. The consumer panel preferred the 1 and 4 month frozen Great Lakes whitefish over the fresh Great Lakes whitefish in cooked appearance, texture, and overall acceptability. The consumer panel could not differentiate a cooked flavor difference between the fresh or frozen Great Lakes whitefish.

A comparison was made in the third sensory analysis test between frozen Great Lakes whitefish and frozen farmed catfish, tilapia, and Atlantic salmon. The consumer panel gave similar ratings to Great Lakes whitefish when compared to tilapia and catfish in the areas of cooked appearance, flavor, and overall acceptability. On cooked texture Great Lakes whitefish scored the same as tilapia and Atlantic salmon. Atlantic salmon did score higher than Great Lakes whitefish in cooked appearance, flavor, and overall acceptability. Wild Great Lakes USA scored the highest on a consumer label preference.

In summary, the Great Lakes whitefish commercial fishing industry should use the results of this study to help position its product against other competing fishery products. Since Great Lakes whitefish is preferred two to one over Canadian inland lake whitefish, retail stores and restaurants that use inland lake whitefish based solely on price should be made aware of these results to help enhance repeat customers. The stigma that frozen Great Lakes whitefish is inferior to fresh product is dispelled in this study as the consumer panel gave the frozen product high scores. Salmon, catfish, and tilapia are in the top 10 species consumed in the United States. They are also the top three fish species in retail value in the United States. Since Great Lakes whitefish compared favorably with these top selling fish species it can compete with its qualities in the market place. When marketing Great Lakes whitefish "Wild Great Lakes USA" should be prominent on the label as this is preference was made by a consumer panel.

TEST ONE

GREAT LAKES VS. CANADIAN INLAND

- The consumer panel preferred Great Lakes whitefish **two to one** over the Lake Winnipeg lake whitefish in the attributes of cooked appearance, texture, and overall acceptability.

TEST TWO

FRESH VS. FROZEN WHITEFISH

- The consumer panel preferred the 1 and 4 month frozen Great Lakes whitefish over the fresh Great Lakes whitefish in cooked appearance, texture, and overall acceptability.
- The consumer panel could not differentiate a cooked flavor difference between the fresh or frozen Great Lakes whitefish.

TEST THREE



GREAT LAKES WHITEFISH VS. FARMED catfish, tilapia & Atlantic salmon

- The consumer panel gave similar ratings to Great Lakes whitefish when compared to tilapia and catfish in the areas of cooked appearance, flavor, and overall acceptability.
- On cooked texture Great Lakes whitefish scored the same as tilapia and Atlantic salmon.
- Atlantic salmon did score higher than Great Lakes whitefish in cooked appearance, flavor, and overall acceptability.

BEST LABEL

- "Wild Great Lakes USA" scored the highest on a consumer label preference.



BURBOT: A terrific tasting fish known by many names

By Jennifer Dale-Burton

One winter day when I was a little girl, my dad took my sister and me out on the river to pull up some lines he'd set with last spring's smelt. He walked up to the first hole, covered with snow and marked with a little flag, and started hauling in a heavy line. (It was a long time ago.) The thing he pulled out of that hole looked like a big, fat, thick-skinned mutant eel, and as it proceeded to throw itself around on the ice, Dad neatly wacked it on the head with a baseball bat, and it was still.

My mother cleaned the fish, taking off long skinny fillets along each side — it hardly seemed worth it. But then she set aside the livers, which were the size of her fist. She poached the fillets, which were firm and sweet. The next morning she rolled the livers in a very fine coating of flour and seasonings, and fried them up for us — they tasted so good, and good for us. We had them with eggs.

Dad explained the fish was only available to us on the St. Marys River in the winter, when it came closer to shore. They liked to stay close to the bottom, and in the colder depths of the lake (Superior) and its big river systems, he said.

The loche, scientific name *Lota lota* — AKA Mize (Ojibwe), Lush, Maria, Burbot, Lawyer, Black Cod, Log Perch, Eel Pout, Ell Pout, Methy, Loche, Lingcod, Cusk, Mud Shark, and Poor Man's Lobster — is the only freshwater cod.

“Lota lota” good recipes for burbot fillet and liver

Loche is plentiful across the northern continents and known as a delicacy in some places, and a trash fish in others. But over time, burbot is becoming better known as fun to fish and fine to eat. Alaskan Natives prize its liver and eggs. Anishianbe call the fish “Mize.” and also love all parts of the fish. In Brittany, loche liver is made into a gourmet pate called “sea foie gras.” Here are some recipes to start off with:

Poor Man's Lobster

In a big stock pot, bring 8 quarts water and 1 tablespoon of salt to a rolling boil. Cut loche fillets into pieces about 4-inches in length. Reduce heat and simmer fish for 5-10 minutes. Don't try to cook too many fish pieces at once or they will not cook evenly. The fish is done when it turns opaque and rises to the surface. Remove with slotted spoon and drain in colander on the back of the stove while the rest of the fish are prepared. They will firm up a little at this time. Serve with melted butter.

Cooks say to make the loche taste even more like lobster, add a can of

I have since found out that loche is found in clear, cold lakes and rivers carved by the glaciers, across both North America and Europe.

Burbot are typically 15 to 22 inches in length, weighing 1 to 3 pounds. But, the record catch in Michigan was an 18-plus pounder from Munuscong Bay in 1980. It must have been quite an old fish, since it takes them 6 to 7 years to mature to spawning size.

The fish is called ugly but I now find it quite attractive — its skin is mottled black to green with a creamy-colored belly. It is found in all the Great Lakes but is rare in Lake Erie.

The burbot are also victims of the sea lamprey but their numbers were at one point returning. Now that sea lampreys have again reared their ugly heads, burbot numbers may again decline.

The burbot fillet, liver and roe are quite nutritious. The fish itself is high in omega-3 fatty acids and Vitamin D, and the liver in particular is high in Vitamin A.

Burbot can be caught in the winter under the ice. They spawn in midwinter shallow waters in gravelly areas. Individual fishermen swear by a variety of gear or bait — ask the locals what's best.

Ice fishing events in the northern Great Lakes Basin are growing in popularity — check out the Escanaba Burbot Bash in Michigan's U.P. and the Leech Lake Eelpout Festival in Walker, Minn.

lemon-lime soda to the water before bringing it to a boil.

Baked Loche Liver

Loche liver is rich, firm and creamy. Fishers say it is best before the fish spawn. Lay out livers seasoned with salt and pepper on broiling pan and bake at 375°F until cooked through. (Use a broiling pan so that the oil drains.) This liver is good as a breakfast meat, with crackers, crusty rolls, or for use in other dishes, such as wild rice pilaf.

Loche Eggs

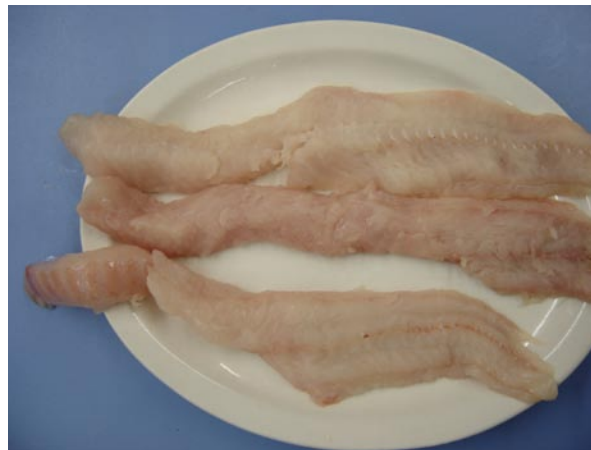
Here is an untested recipe from “Best Cranberry Recipes of the Canadian Western Arctic,” by Judy Semple, Aklavik, NWT: “Fry a good amount of loche liver and loche eggs. Crush it with a potato masher. Add 2 or 3 cups of cranberries. Add sugar to taste. Stir together in a mixing bowl. Put into a cake pan. This is good hot or cold. You can even freeze it and have it for a snack later. Can also be made with whitefish liver and eggs.”

Sounds interesting.



Lota lota from “La Pesca e i Pesci d'Acqua Dolce”, by H. Chaumeton, ed. Arnoldo Mondadori, 1986

Above is a beautiful example of the burbot, also known locally as loche. The fish is mottled green to black with a creamy underside.



Photos used courtesy Creighton Regional Development Corp. <http://www.saskntfp.com>

Above are nice examples of loche fillets (L) and loche livers (R). The fillets are thin strips of firm white flesh flaky and mild when cooked. The fist-sized livers are full of omega-3 fatty acids and Vitamin A.

Kennecott sulfide mining application on back burner

By Jennifer Dale-Burton

On March 1, the Michigan Department of Environmental Quality (DEQ) announced that it had withdrawn its proposed decision to approve a permit for the Kennecott Eagle Minerals Company to conduct mining operations at the proposed Eagle Project Mine. Public hearings scheduled for March 6-8 were postponed.

A DEQ release said the decision was made after discovering that two reports on the structural integrity of the mine were not made public. “As a result, there has been an insufficient opportunity for the entire mining team and DEQ management to review the additional technical reports and determine their significance from a technical, legal, and policy perspective,” said the DEQ statement.

In a joint press release, top environmental groups, including the League of Conservation Voters Education Fund, Michigan Environmental Council, Save the Wild UP and Sierra Club's Michigan chapter, have called for the reassignment of the DEQ's top mining regulator, Geological Survey Division Chief Hal Fitch, as “essential to restoring integrity to the agency's mine permitting process.”

“Whether or not this inexcusable breach of trust was done with Mr. Fitch's knowledge is beside the point,” said James Clift, Policy Director of the Michigan Environmental Council. “It is symptomatic of a relationship Mr. Fitch and his subordinates have with Kennecott

that is compromising their ability to make objective decisions regarding this application. It has seemed from Day One that the regulators were acting more as an arm of Kennecott Minerals than the public watchdogs they are supposed to be. We have confidence that Gov. Granholm and MDEQ Director Steve Chester will find a replacement whose integrity and impartiality is beyond reproach.”

The DEQ director said, “This department has committed itself to making this process as open and transparent as possible. In light of this information, we must allow the needed time for ourselves, as well as the public, to give it the appropriate review.”

In a separate statement, Save the Wild U.P. called the reports “suppressed,” and that the suppression has already proved that the mining application process does not work.

“Just imagine being a miner when the roof fails and tons of rock and millions of gallons of water from the Salmon Trout crash in. It's the worst-case scenario with many deaths likely, and it would leave the Salmon Trout and the watershed bleeding sulfuric acid into Lake Superior for thousands of years,” said Dick Huey, of Save the Wild U.P.

The two reports, “Technical Review — Crown Pillar Subsidence and Hydrologic Stability Assessment for the Proposed Eagle Mine,” prepared for the DEQ by David Sainsbury, Ph.D., Itasca Consulting

See “Kennecott Sulfide Mine,” page 4



BOATS FOR SALE

42-FOOT GILL NET TUG



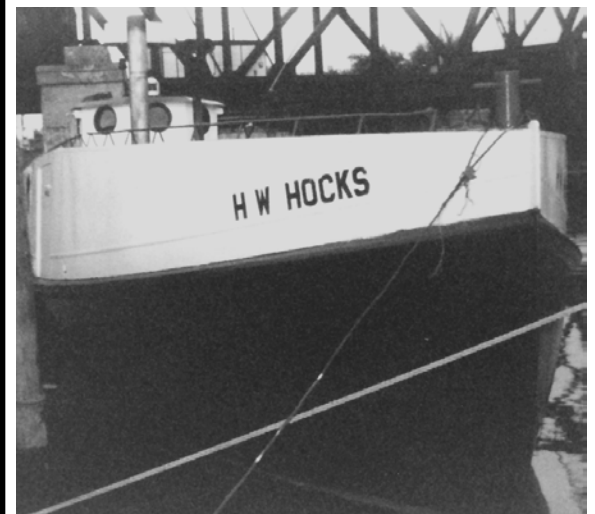
FOR SALE — 42' Gill Net Tug "Niibing Nimido" (Formerly the "Francis Clark"). This steel tug was constructed in the 1950s, but has been well maintained and is very clean. The vessel is powered by a 630 Caterpillar diesel engine and has a 30" lifter. Currently docked at the Arthur Duhamel Marina at Peshawbestown, Mich. Contact Don Chippewa or Rose Weese at 1645 S. Center Highway, Suttons Bay, MI 49682, for more information. Or, contact the Grand Traverse Band Natural Resources Department at 231-534-7500 to relay a message.

36-FOOT TRAP NET BOAT



SHAMROCK FOR SALE — The beautiful 36-foot, diesel-powered trap net boat "Shamrock" is for sale for \$40,000. Included is a new Perkins 115T motor and a 4-axle trailer. Call 248-2150.

HW HOCKS FOR SALE



FISHING VESSEL FOR SALE — H. W. Hocks, 48-foot + 13-foot + 6 draft. CAT D-13000 6 Inline, Power Take Off, Pony Motor Starter. Twin Disk Trany, 4-inch Propeller Shaft, Large Rudder. New 24-mile Radar, 600-foot Depth Finder, GPS, Large 8-inch Compass, and 30" Crosely gill net lifter. Warm Vessel: Coal and Wood Stove. Contact Skip Parish Sr. at 248-2848.

Tribal leader calls for immediate action on ballast water discharges

WASHINGTON D.C. — Frank Ettawageshik, tribal chairman for the Waganakising Odawak (Little Traverse Bay Bands of Odawa Indians), testified before the House Transportation and Infrastructure Committee in Washington D.C. on March 7 regarding aquatic invasive species. Speaking on behalf of CORA, Ettawageshik called for immediate action to stop introductions of exotic species through unregulated ballast water discharges.

Ettawageshik explained the Anishinabe principal of planning for the seventh generation with the understanding that sometimes there needs to be immediate action to protect the needs of the coming generations. "Today," Ettawageshik said, "is one of those times we call for immediate action."

Ballast water from ships coming from overseas is the source of most invasions of aquatic invasive species in the Great Lakes. There are at least 183 exotic species proliferating in the Great Lakes today, including sea lamprey, zebra mussels and round goby. The cost to control the damage caused by these species is estimated to be more than \$5 billion per year.

Aquatic invasive species are ruining the fisheries that tribal commercial fishers depend upon for a living. Ballast water has also been implicated for the introduction of a new deadly fish disease called viral hemoragic septacemia or VHS.

"Commercial fishing on the Great Lakes, particularly tribal fishing, is on the verge of collapse," Ettawageshik said.

CORA has been pushing for stronger ballast water legislation



Photo by Christine Manninen, Great Lakes Commission

ACTION NOW — On March 7, Frank Ettawageshik (above, left), Little Traverse Bay Bands of Odawa Indians tribal chairman, testified to Congress that immediate action is needed to stop ballast water as a source of new Great Lakes aquatic invasive species. Testifying above is Gary Becker, mayor of Racine, Wisconsin. Others speaking to Congress that day were Rep. Vern Ehlers, Rep. Rahm Emanuel, Rep. Mark Kirk, Rep. Tim Walberg, Wisconsin DNR Water Division Administrator Todd Ambs, Healing Our Waters-Great Lakes Coalition Director Jeff Skelding, and National Wildlife Federation's Great Lakes Office Director Andy Buchsbaum. According to PR Newswire, more than 100 hunters, anglers, and environmentalists were in attendance to press for immediate restoration to avoid a further deterioration of the lakes.

to prevent any new introductions of aquatic invasive species to the Great Lakes. With a new Congress in place, it is hoped that legislation will finally pass. CORA has supported Michigan's ballast water legislation with the understanding that laws covering

the entire United States would be better. Senator Carl Levin recently introduced legislation that would require ships to treat ballast water by the year 2012.

It is hoped that the House of Representatives will soon introduce a similar bill.

Grand Traverse Band hires new environmental stewardship director



Photo courtesy GTB News

Kris Petoskey has been hired as Grand Traverse Band of Ottawa and Chippewa Indians environmental stewardship director.

Smelt packs goodies

Smelt are healthy and fun at the same time. They are on the lowest end of contaminants such as PCBs and mercury. They are high in omega-3 fatty acids. There are 1.2 grams of omega-3 fatty acids for every 100 grams of smelt consumed. In comparison, canned light tuna in water (of the sort available in stores with lower mercury levels) has about 0.3 grams per 100 grams.

(Sources: ITFAP, ASTDR, Addis)



Smelt Sampler

The next time you have a smelt fry, try serving them with a variety of dipping sauces, like tartar sauce, ranch, cocktail sauce, chipolte, honey mustard, hot mustard, or your own favorites.

Omega-3s: the brainiest food around

By Jennifer Dale-Burton

Including enough omega-3 fatty acids in our diet is key to fetal development in the womb and to lifelong health, researchers have determined. Including enough omega-3s in our diet provides relief for some conditions and prevents others.

Mothers pass omega-3 fatty acids on to their developing children during pregnancy and breastfeeding. As life goes on, omega-3s are needed for brain development and brain health, protection against cardiovascular disease, inflammatory diseases such as rheumatoid arthritis, as well as an array of health issues surrounding obesity, diabetes and even Alzheimer's. In fact, the American Heart Association recommends that adults with cardiovascular disease get a daily 1,000 mg dose of omega-3s.

Scientists have been studying the health benefits of omega-3s for some time, and have found a number of beneficial uses, such as stroke and heart attack prevention. They later found that omega-3s in the diet were important for those at risk for depression, arthritis, and Alzheimer's. At a recent symposium, scientists' findings show clear evidence that omega-3s are so important in the human diet, that lacking them can have an adverse effect on health. In fact, researchers at the symposium felt that the evidence presented is compelling enough for the Food and Drug Administration (FDA) to make recommendations regarding omega-3 fatty acids, arguing that omega-3 fatty acids are "important from womb to tomb."

What are Omega-3 fatty acids?

Most people have heard that saturated fats (red meat) and "transfats" (margarine) are unhealthy, causing a high cholesterol level that in turn heightens risk of heart attack. Also, most people have heard that polyunsaturated and monosaturated fats (olive oil) are good for our bodies.

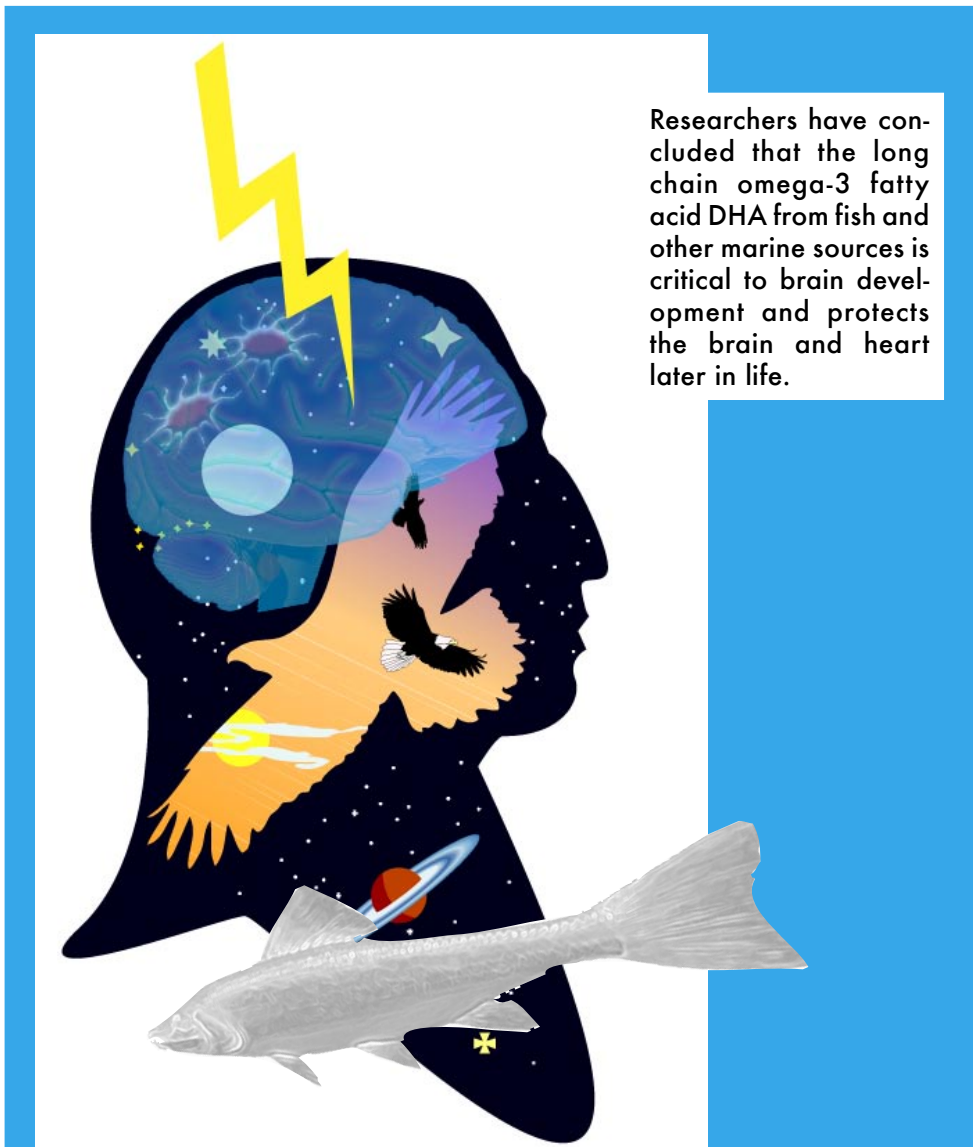
Omega-3 fatty acids are essential polyunsaturated fatty acids that are used by the human body, but cannot be manufactured by the human body.

There are two basic kinds of omega-3s. One kind of omega-3 fatty acid is plant-based. Walnuts and flaxseeds are abundant in this type of omega-3. The other kind is marine-based. It is mostly found in fish oils, and fatty coldwater fish are especially abundant in these oils.

From Kennecott Sulfide Mine, page 2

Group Inc., and a later May 22, 2006, technical review memo from Sainsbury, cast doubt on the safety of the mine.

"The analysis techniques used to assess the crown pillar stability of Eagle Mine do not reflect industry best-practice. In addition, the hydrologic stability of the crown pillar has not been considered. Therefore, the conclusions made within the Eagle Project Mining Permit Application regarding crown pillar subsidence are not considered to be defensible," wrote



Researchers have concluded that the long chain omega-3 fatty acid DHA from fish and other marine sources is critical to brain development and protects the brain and heart later in life.

Great Lakes Fish High In Omega-3s!

Lake Herring.....	3.6	Chinook Salmon	1.3
Chubs	3.5	Rainbow Smelt.....	1.3
Lake Whitefish	3.4	Walleye	0.4
Lean Lake Trout.....	3.0	Yellow Perch and Loche ...	0.3
Coho Salmon.....	1.5		

The marine-based omega-3 fatty acids are a more complex form made out of a longer molecular chain. This is the kind of omega-3 fatty acid our bodies can use — about 60 percent of the human brain is made up of these complex omega-3s, called DHA, and it is especially abundant in brain and eye tissues.

The plant-based omega-3s are less complex, and our bodies use them to make the more complex omega-3s, although not efficiently. Only about 5 percent of plant-based omega-3s we ingest are converted. This is not to say we should not eat them — it's a lot better to eat plant-based omega-3s than it is to eat other fats.

Omega-3 vs. omega-6

Most people eat way too many omega-6 fats and not enough omega-3s.

When omega-3s are not available, the body replaces it with a substitute from the omega-6 class of fatty acids. This replacement fatty acid cannot replace all of the functions of the marine-based omega-3, DHA.

Health professionals know there should be a balance between omega-6 and omega-3 fatty acids, but disagree on the exact ratio — it should be in the range of 1:1 to 4:1. The typical American diet is usually a ratio of 11:1 to 30:1. The richest source of omega-6 fatty acids is safflower oil. Sunflower, corn and sesame oil also have a lot of omega-6s.

Some medical research has suggested that excessive levels of omega-6 fatty acids, relative to Omega-3 fatty acids, may increase the probability of a number of diseases. Several medical conditions are

Sainsbury in his May 22 memo.

All of this followed on the heels of a United States Environmental Protection Agency (EPA) announcement in February that at least one federal permit will be required before construction may begin.

In a letter to Kennecott representatives, EPA Water Division Director Jo Lynn Traub urged the company to submit previously requested information regarding a treated water infiltration system

proposed by Kennecott. The proposed system is a series of pipes buried underground that allows treated water to trickle back into the ground, impacting the entire aquifer.

In the meantime, the DEQ has stated that it will share the findings of its review with the public as that information becomes available, and the technical reports will be posted on the DEQ's Web site at <<http://www.michigan.gov/deqogs>>, then click on Kennecott Eagle Project.

associated with substantially lower levels of omega-3 fatty acids compared with healthy people. While it has not been conclusively proven that low levels of omega-3s are responsible, replenishing them is associated with significant improvements in several instances. Examples of these conditions include depression, bipolar disorder, and attention deficit hyperactivity disorder (ADHD).

Omega-3s and healthy babies

Also reported at the symposium was the importance of omega-3s for a healthy pregnancy. The expert panel at the Symposium decided to recommend 300 mg a day of DHA omega-3.

Researchers found that women who experienced recurrent miscarriages were helped by omega-3 supplements. There was an 86 percent improvement in miscarriages over a 3-year period.

Other studies have shown that postpartum depression is associated with low levels of omega-3s in the diet. The researchers determined this is because expectant mothers' omega-3s go to their developing baby and later the breastfeeding baby. This leaves mothers with low levels, which impacts their own health.

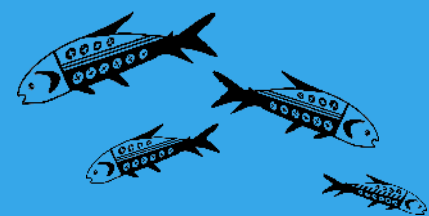
The United States has some of the lowest levels of DHA omega-3s in human milk, while the highest levels are found in Japan, where people eat much more fish. Although scientists acknowledge the need for more studies in this area, they reason that DHA is essential in cognitive and visual development because DHA is concentrated in the brain and eyes.

Research discussed how children benefit from early DHA supplementation. They have higher IQ scores and better neurological development, body control, coordination and fine motor skills.

(Sources: *Omega-3 Fatty Acids: Recommendations for Therapeutics and Prevention Symposium, Institute of Human Nutrition, Columbia University College of Physicians and Surgeons, New York; University of Maryland; American Heart Association*)

Deadline

The next deadline for the CORA newsletter "Preserving the Resource" is Monday, May 7, 2007. Call or write Jennifer Dale-Burton at the CORA Public Information & Education Program 906-632-0043, or jmdale@chippewaottawa.org. See <<http://www.1836cora.org>> for archived newsletters.



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BIA 2007 Office Closures:

May 28, July 4, September 3, October 8, November 12, November 22, and December 25.