Mercury level in fish caught in Indian River Lagoon higher than it should be?

Harbor Branch launches new study of humans who eat fish and live around the estuary

By Scott Wyland

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INDIAN RIVER COUNTY — A 20-year-old man fishes local waters every day for his meals and scoffs at the idea he might ingest too much mercury.

"I ain't dead yet," said Justin Baird, who stopped at a Sebastian Inlet tackle shop one gusty afternoon after making his day's catch. "I've been eating fish since I was a little kid."

His haul included mackerel, sheepshead, red drum and speckled trout. Baird, who is jobless, figured he would gobble it up in two days.

Chances are, all the fish contained some mercury.

As the poor economy drives residents like Baird to fish to survive, marine researchers in Fort Pierce are studying the degree to which eating fish from the Indian River Lagoon and other regional waters can boost people's mercury levels. The toxin can damage various parts of the human body.

The lagoon's dolphins have tested at some of the highest levels of mercury seen in the species worldwide. That made researchers at Harbor Branch Oceanographic Institute curious about how mercury in the lagoon and adjacent waters might affect people.

They began collecting and testing hair samples last year from people who live near the lagoon — something they'd never done before on Florida's eastern coast. The data will be made available to federal, state and local agencies and perhaps be used in future advisories for people fishing in the lagoon.

By testing both genders, this research goes further than a 2010 study by the Martin County Health Department, which measured mercury levels in 400 local women and found a fourth of them had elevated amounts — the highest rate nationally among women tested.
Mercury is a neurotoxin that accumulates in the body's fatty tissue over time and can cause brain damage, muscle weakness, tremors and death, according to state health officials. Pregnant women with high mercury levels are more likely to give birth to children with damaged nervous systems.

"Mercury is a big one (neurotoxin) because it eats holes in the brain" when the level is high enough, said Jeff Beal, marine biologist for the state Fish and Wildlife Conservation Commission.

Fish often pick up an organic form of the substance known as methylmercury. It forms when rainfall carries vaporized mercury — emitted from coal-fired power plants and mines — into waterways laden with certain bacteria.

The Everglades, Lake Okeechobee and the lagoon all have depleted oxygen, making them breeding areas for bacteria that generate methylmercury, according to biologists. Some researchers believe sulfates from fertilizers and fungicides boost the growth of methylmercury.

Health Concerns

Last summer researchers took 59 hair samples from adults who lived near the lagoon, mostly in St. Lucie County, and found their average mercury levels were higher than in other test areas in North America. Nearly all participants ate some seafood, making it likely that the higher mercury came from fish, researchers say.

Only 9 percent of them said they caught their own fish, evidence that eating a diet heavier in seafood — even if store-bought — can raise a person's mercury level, said Adam Schaefer, a Harbor Branch epidemiologist.

Harbor Branch's goal is to take at least 150 hair samples, including from people in Indian River and Brevard counties, with an increased emphasis on impoverished residents who fish in the lagoon and nearby waterways for their meals, Schaefer said.

Baird indicated he eats fish a dozen or more times a week, including species that health officials advise against eating more than once or twice a week, such as sheepshead and red drum.

"He's way over what anybody would say is recommended," Schaefer said. "He's obviously being exposed to (mercury) levels. When you talk about the health effects, these are cumulative effects."

So far, mercury levels in the hair samples aren't alarming, but they cause some concern because no amount of this toxic substance in a person's system is healthy, Schaefer said.

Mercury averaged 1.5 parts per million of hair in people living near the lagoon, a level considered elevated by federal standards. That's almost double the mercury found in samples taken in Wisconsin and Montreal, Quebec, and about 35 percent more than in samples gleaned at the Louisiana Gulf Coast.
The mercury concentration in those who were tested depended on how often they ate fish as well as the type and size of the fish, according to a Harbor Branch report.

Research is limited on what is a dangerous, chronic level, Schaefer said. He must notify people who test above 5 parts per million that they have a hazardous concentration, he said, adding it hasn't happened yet.

The state Department of Health has issued a mercury advisory that recommends how often you should eat certain types of fish caught in particular waters, whether it's a lake, river, lagoon or the ocean.

Because mercury can neurologically impair developing fetuses and children, the advisory suggests women of childbearing age and kids ingest certain fish less often than men.

For example, children and younger women are told to not eat blackfin tuna and king mackerel caught in coastal waters, whereas men can eat either once a month. Younger women are also told to avoid swordfish, tuna steak, tile fish, Chilean sea bass and orange roughy.

Many of the fish on the list are "not a huge deal for males," said Derek Tremain, an assistant research scientist for state Fish and Wildlife.

However, Schaefer advised against men eating fish with reckless abandon.

Men who were tested had roughly 2.5 times the mercury concentration of the women, the report states.

The men either ate heftier quantities of seafood or feasted on bigger, predatory fish, which tend to be laced with more mercury, Schaefer said.

"You need to be pretty savvy about what species you're eating," Schaefer said.

**Escalating Doses**

Mercury escalates as it makes its way up the marine food chain.

Oysters and clams eat mercury-tainted plankton and microbes. Bigger fish gobble these shellfish and, in turn, fall prey to even larger fish. As the mercury is passed on to the next larger predator, it magnifies until it reaches the apex: dolphins, humans and other mammals.

Mercury absorbs in fat, so the oilier types of fish will carry more of the chemical, Beal said. He noted blackfin tuna is oilier than yellowfin tuna and thus contains more mercury.

Largemouth bass, black grouper, snook and "jacks" — a variety of predatory marine fish — are other examples of fish that can collect higher doses of mercury, according to the health advisory.
A group of men who were fishing near a Sebastian Inlet bridge were aware of the mercury advisories, but seemed unconcerned.

"You've got to eat a lot of fish to get to the amount of mercury that will harm you," said Clint Weise, 64, who's a part-time winter resident in the Sebastian area.

Weise said he takes precautions such as slicing off salmon's belly fat, where most of the mercury collects.

Rich Maldonado, 49, who recently moved to Palm Bay from New York, said he tries to eat as healthy as possible — a habit that was reinforced when he competed in bodybuilding contests.

These days, most everything people ingest is bad in some way, he said as he flung his fishing line into the water.

"You've got to eat fruits, vegetables, something. What are you going to do, not live?" Maldonado said. "Fish is one of the healthiest things you can put in your mouth."

He eats a mixture of fish he catches and buys at the store a total of twice a week, he said.

His son, Justin Maldonado, 22, who's unemployed, eats fish several times a week, and mainly what he snags from local waters. He thinks it's a healthier alternative to meat, despite the mercury.

"But I also smoke cigarettes," he said, smiling. "The main thing is that fish is so much better when it's fresh."

Across the way on the north jetty, John Cruz, 72, who hails from Orlando, withstood strong gusts and crashing waves that occasionally drenched him as he dangled a line in the ocean.

Cruz has fished here for almost 20 years and has caught everything from sheepshead and drum to pompano and flounder.

He eats fish a couple times a week and doesn't worry about what species it is.

"We don't fish in the river or lakes," Cruz said. "The ocean — it's got to be safe."

**Part of Larger Problem**

But the ocean is not immune to mercury-tainted fish, researchers say.

Larger seagoing fish can eat smaller fish that swam from rivers into the ocean after ingesting mercury, Tremain said. Or fish can dwell in a contaminated area such as Lake Okeechobee and travel north through the estuaries to the Sebastian Inlet.
"There is a complex system all around and it's a tough system to track," Tremain said.

The Indian River Lagoon is enclosed and lacks a strong flushing action, so contaminants like mercury get trapped, said Grant Gilmore, senior scientist for Estuarine, Coastal and Ocean Science, a Vero Beach research firm.

"You have to be more careful with this estuary versus ones in other parts of the state," Gilmore said.

Harbor Branch is gauging people's mercury intake as part of an integrated study of the troubled lagoon, Schaefer said.

Researchers are studying other problems such as nitrogen and phosphorous runoff from lawn fertilizers generating algae blooms in the lagoon. The algae blocks sunlight and sucks up oxygen, killing plant life that feeds smaller fish and, in turn, degrades the ecosystem.

In the past, various agencies and researchers would do studies on the lagoon that were disconnected, Schaefer said.

Now an epidemiologist like himself is sharing notes with experts on fish, dolphins and water quality to better combat current problems and prevent future ones in the lagoon, Schaefer said.

The mercury study is in an early stage and there are many questions to answer, he said. For example, why dolphins in one section of the lagoon test higher for mercury than those in another section, or why fish in one lake show more mercury than fish in a neighboring lake.

The purpose is to not scare people away from seafood, but help them make informed choices, Schaefer said.

Baird said no one will discourage him from eating fish, his main source of protein.

"I don't eat red meat," Baird said. "I eat fish every day. That's all I eat."

**SELECT MERCURY LEVELS**

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<th>Location</th>
<th>Test subjects</th>
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MERCURY HAZARD

Mercury is a neurotoxin that absorbs in the fatty tissue and accumulates over time.

A concentrated enough dose can cause brain damage, muscle weakness, tremors and death.

Pregnant women, nursing mothers and children are at the most risk.