

April 11, 2001

METHYLMERCURY: A FISHERMAN'S POINT OF VIEW

Robert P. Jones, Executive Director
Southeastern Fisheries Association
1118-B Thomasville Road
Tallahassee, Florida 32303
850/224-0612 e mail Bobfish@aol.com

I attended the Methylmercury Symposium in Charleston, South Carolina held on April 9th and 10th, 2001. Over 200 people heard a wide array of PhD's discuss the methylmercury situation. The reports were professionally presented, technically challenging and understandable for the most part if you paid attention. This Symposium resulted from concern on the part of South Carolina officials and others monitoring levels of methylmercury in fish with the catalyst being the recent mercury advisory on the consumption of king mackerel.

South Carolina seems to issue the most number of Fish Consumption Advisories of any state in the nation. South Carolina established fish consumption advisories in 1976. For more specific information on the South Carolina program you can visit their website at : www.sedhec.net/eqc/admin/html/fishadv.html or you can call toll free 888/849-7241 for a copy of ML#004042 which shows the 2001 SC Fish Consumption Advisories. I will also be posting Technical Report Number 88, by Charles J. Moore entitled: *A Review of Mercury in the Environment (Its Occurrence in Marine Fish)* on our website at www.southeasternfish.org.

What is mercury?

“According to the EPA, mercury is a basic chemical element of which there is a fixed amount on earth. It is a heavy, silvery white liquid that vaporizes quickly at ambient temperatures. It exists in three oxidation states: metallic, mercurous and mercuric. Most mercury occurring in the atmosphere is in the form of elemental vapor. Most mercury in water, soil, sediments or biota is in the form of inorganic salts or organic (methylmercury) forms.”¹

Numerous reports indicate most of the mercury emitted into the atmosphere is from power generating plants built thirty to sixty years ago that still burn fossil fuel. Additionally municipal waste combustion facilities and medical waste incinerators also emit mercury.

¹ Moore, Charles J., *A review of Mercury in the Environment*, April 2001

It must be noted that power generating plants built after World War II contributed greatly to the growth and comfort of the nation. It isn't fair to point a finger at this strategic industry without first noting how many jobs it has created and how electricity has made our lives so comfortable. On the other hand, it is now past time for the power plants, municipal plants and incinerators still burning fossil fuel, to step up to the plate and spend whatever it takes to remove mercury from their emission process.

Mercury in its inorganic form is poorly absorbed in the digestive tract of man and animal. If inorganic mercury is consumed it moves swiftly through the body because it is not absorbed. On the other hand, "methylmercury is almost completely absorbed within the digestive track."²

Mercury becomes methylated through biological and chemical actions expedited by certain compounds in the water or sediments. Once mercury changes into methylmercury it is toxic and can be a health risk to humans. A recent report notes "the South Florida Basin, Nevada Basin and Range, Sacramento (Calif.) River Basin, the Santee River Basin (South Carolina) and Coastal Drainages and Long Island and New Jersey Coastal Drainages have the greatest mercury contamination."³

It is strongly speculated that agricultural runoff and phosphates flowing through the South Florida Basin contribute to the process of changing mercury into methylmercury because this specific kind of pollution and runoff exacerbates the biological process for formation of methylmercury. This could be the reason for the high concentrations of methylmercury in fresh water fish such as black bass. In other basins and wetlands, the process of methylation of mercury takes much longer as the ingredients necessary for the process are absent or much less.

So Where Are We?

The US Food & Drug Administration has had an action level of 1.0 ppm of mercury since January 19, 1979.⁴ In 1984, the original action level ppm for mercury was set at 0.5 ppm for fish & shellfish but this regulation was challenged in court and subsequently changed based on additional information. At that time FDA converted the standard based on methylmercury.

Swordfish and tuna were high visibility fisheries in the 1970's and when the 0.5 ppm was established the swordfish landings decreased significantly.

² Ibid

³ Krabbenhoft, David. P, et al, *Mercury loading and transformations in aquatic ecosystems and its bioaccumulation in fishes: What can we say from a national perspective?*, Mercury Symposium, April 9, 2001

⁴ Federal Register, 44:3990, January 19, 1979.

After the level was raised to 1.0 ppm and after the Magnuson Act was passed in 1976 bringing all distant water commercial fishing fleets back to US waters, the landings of swordfish increased to 37 million pounds in 1989. The FDA level of 1.0 ppm for methylmercury for fish remains as the action level.

The US Environmental Protection Agency, based on a Report by the National Academy of Sciences⁵ and their own work have recommended the following: “Table 4⁶. EPA recommended monthly fish consumption limits (number of 8 ounce portions) of fish containing various levels of MeHg (methylmercury) for an individual weighing 158 pounds in order to not exceed the recommended RfD of 0.0001mg/kg of body weight/d.(EPA 1999)

| Concentration in fish tissue MeHg (ppm) | Fish meals/ month 8 ounce portions |
|--|--|
| >0.03 – 0.06 | 16 |
| >0.06 – 0.08 | 12 |
| >0.08 – 0.12 | 8 |
| >0.12 – 0.24 | 4 |
| >0.24 – 0.32 | 3 |
| >0.32 – 0.48 | 2 |
| >0.48 – 0.97 | 1 |
| >0.97 – 1.90 | 0.5 |
| >1.9 | NONE” |

To compare fish species with this EPA proposal I list the following species and the mean mercury levels that have been collected by the Gulf of Mexico Program from 1990 to 1999.

| SPECIES | # SAMPLES | MEAN Hg in Edible tissue ppm | MAX PPM |
|-------------------------|-----------|---------------------------------|---------|
| Blacktip shark | 73 | 0.86 | 2.0 |
| Bonnethead shark | 76 | 0.51 | 1.4 |
| Groupers (Mycteroperca) | 64 | 0.43 | 1.4 |
| Jack Crevalle | 68 | 0.63 | 3.1 |
| Sand seatrout | 93 | 0.57 | 0.9 |
| Largemouth bass | 723 | 0.46 | 1.6 |
| King Mack > 39” | 58 | 0.96 | 1.7 |
| King Mack (33”-39”) | 89 | 0.69 | 1.1 |
| King Mack < 39” | 77 | 0.60 | 1.7 |
| Spanish mackerel | 179 | 0.57 | 1.7 |
| Common snook | 190 | 0.50 | 1.5 |

⁵ National Research Council, *Toxicological Effects of Methylmercury*. 2000

⁶ Moore, Charles J., *A Review of Mercury in the Environment*, April 2001, page 11

The king mackerel health concern helped generate a sampling program by North Carolina, South Carolina, Georgia and Florida.

KING MACKEREL SAMPLED 1999

| <u>Size category</u> | <u># of fish</u> | <u>Average methylmercury</u> | <u>Range</u> |
|----------------------|------------------|------------------------------|-----------------|
| < 27 INCHES | 19 | 0.22 PPM | 0.14 – 0.36 PPM |
| 27 TO 32 INCHES | 43 | 0.34 PPM | 0.15 – 1.00 PPM |
| 33 TO 39 INCHES | 53 | 0.80 PPM | 0.25 – 2.10 PPM |
| > 39 INCHES | 66 | 1.54 PPM | 0.40 – 3.50 PPM |

The King Mackerel Problem.

King mackerel landed commercially average 27 to 34 inches in length and the overall mercury level of commercially caught fish was 0.6 PPM. The FDA determined that there is a small chance of commercially caught king mackerel having more than 0.6 PPM and the commercially caught king mackerel over 39 inches make up a very small proportion of king mackerel that are supposed to be sold on the market that it (FDA) does not prohibit the sale of king mackerel larger than 39 inches.⁷

Where I contend FDA , NMFS and other state and federal agencies “misses the boat” so to speak, is that hundreds of thousands of pounds of recreationally caught king mackerel are sold by sponsors of king mackerel tournaments in the southeastern United States. Most significantly, the bulk of these tournament king mackerel are far larger than 39 inches in length and as such pose a significant health risk to certain sectors of the population. The thrust of high stake king mackerel tournaments is to catch as big a king mackerel as possible each day of the tournament. The biggest fish can bring \$100,000 and up to the lucky angler. While the Southeastern Fisheries Association does not object to the sport fishing tournaments, we do object to selling these high mercury content king mackerel on the market. Sport caught fish, especially scombroid-toxin forming species like king mackerel, should never be sold now that the federal government requires mandatory federal inspection of all facilities selling fish in the United States. King mackerel over 39 inches in length, besides having higher contents of mercury can also develop histamine poison if not properly handled.

Under FDA rules, all commercial fish dealers must randomly probe the internal temperature of all king mackerel they receive and a record must be kept and available for inspection. Tournament caught fish by anglers should not be sold to the general public.

There are numerous sites on the Internet that discuss mercury in fish. One of the most informative is located at: <http://www.cfsan.fda.gov/~frf/sea-mehg.html>

⁷ Pers.Communication to Charles J. Moore, from Gregory M. Cramer, FDA-CFSAN, 2000.

This is a very short statement pertaining to a very large problem, potentially the biggest problem the United States seafood industry has ever faced. If the US Environmental Protection Agency or Congress were to set an action level of 0.2 PPM for methylmercury, most seafood would disappear from the American diet, including American lobster, grouper, tuna, snapper et al.

I close with a story concerning pollution in Florida that can be applicable to all those who are polluting our environment.

In the early 1970's, Clyde Richbourg, President of Southeastern Fisheries Association and I attended a federally sponsored public hearing in Pensacola to discuss local pollution problems. The hearing was conducted by a crusty, old, federal official. I recall a simply marvelous exchange between him and a CEO from a company that was a significant contributor to the pollution of Pensacola Bay.

The CEO from company X marched stiffly to the microphone in the center of the aisle being used for the audience to ask questions of the federal panel. This handsomely dressed executive, with a rich baritone voice, told the panel and those in the crowded room about the many uses of his company's products and how greatly the plant contributed to the overall economy of the county by providing hundreds of jobs. To make his point crystal clear, and to sway public opinion if he could, he paused and then closed by saying words to the effect, **"We were invited into your homes and now you condemn us for being here."**

The federal official had a tinge of a grin on his face as he stood and picked up the microphone and said, **"You are absolutely right that these good people did invite you into their homes and you came willingly. But they did not invite you to urinate on their living room carpet."**

You could have heard a pin drop as the CEO walked quickly back to his seat. That one comment said more than reams of rantings and ravings. The same is true today.

We all must pull together to stop people from urinating on our living room carpet.