Frequently Asked Questions About Mercury in Seafood

2013 FLORIDA SEAFOOD BROWN BAG WEBINAR SERIES
2013 Florida Seafood Webinar Series

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Program Goals

- Help answer frequently asked questions regarding seafood and mercury
- Make consumers more informed on how to maximize the health benefits associated with consuming seafood while minimizing risks associated with mercury
What is mercury and how does make its way into the environment?

- Naturally occurring element
  - Heavy metal
- Found in air, water, and organisms in various concentrations

<table>
<thead>
<tr>
<th>Natural Sources</th>
<th>Human-Caused Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atmospheric deposition</td>
<td>Burning of fossil fuels</td>
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<tr>
<td>Mineral recycling</td>
<td>Mining operations</td>
</tr>
<tr>
<td>Volcanic activity</td>
<td>Incineration of wastes</td>
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<td>Batteries and thermometers</td>
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</tbody>
</table>
Why do some types of seafood have higher levels of mercury than others?

- Biomagnification
- Age of fish
- Diet
- Location
  - Freshwater
  - Coastal waters
  - Open ocean

80-90% of mercury can be transferred per trophic level

Diagram adapted from Dr. Darren Rumbold, FGCU
Why is mercury in the diet a concern?

- Developmental toxicant
- Evidence of neurological impairment when consumed in large quantities
  - Minamata Bay, Japan: 1950’s
  - Iraq: 1970’s

<table>
<thead>
<tr>
<th></th>
<th>Mercury levels in hair (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>2.46 – 700</td>
</tr>
<tr>
<td>Iraq</td>
<td>1 - 674</td>
</tr>
<tr>
<td>US</td>
<td>0.47 – 1.73</td>
</tr>
</tbody>
</table>

*The concentrations of mercury consumed during the Japan and Iraq events are not found in the U.S.*
Question
How was the safety level of mercury determined?

Two Major Studies
- Faroe Islands
- Seychelles Islands

- Establishment of a Reference Dose (RfD)
  - 10-fold safety factor
  - One of the most restrictive in the world
  - Based on a **lifetime of exposure**
    - **NOT** a line in the sand
Is mercury in seafood a health concern for most people in the U.S.?

• According to the U.S. EPA, most people’s fish consumption does not cause a health concern
  ○ Risk is low for those who consume the recommended two servings of seafood a week
  ○ Eating a variety of seafood lowers the risk even more
  ○ Mercury is eliminated from the body over time

Image credit: Bryan Fluech, FSG
Question
What does the 2004 U.S. EPA/FDA Mercury Advisory Recommend?

Recommendations
- Eat 8 to 12 ounces (2 servings) of a variety of seafood a week
- **Avoid:** shark, swordfish, king mackerel, and tilefish
- Limit white (albacore) tuna to 6 ounces per week
- Check local advisories for recreationally caught seafood

**IMPORTANT:** *this advisory is intended only for pregnant women, women who may become pregnant, nursing mothers, and young children.*

*There is no specified advice for older groups*
“Fish and shellfish are an important part of a healthy diet. Fish and shellfish contain high quality protein and other essential nutrients, are low in saturated fat and contain omega-3 fatty acids. A well balanced diet that includes a variety of fish and shellfish can contribute to heart health and children's proper growth and development.

Thus, women and young children in particular should include fish or shellfish in their diets due to the many nutritional benefits.”

U.S. EPA/FDA Mercury Advisory
Why has there been confusion over mercury and seafood?

- Unintended “Spillover” effect from past EPA/FDA advisories
  - Many thought the message applied to elderly and to adult men

- Pregnant women confused
  - Precautionary principle prevailed

- Contradictory media messages about the benefits of fish and the risks of Mercury
What do I need to know mercury in fish that is caught recreationally in Florida?

- Most fish caught in Florida can be eaten without harm, however...
  - Mercury advisories do exist for most fresh water bodies and coastal waters
    - Women of childbearing age, children
    - All others

Table 1. Eating Guidelines for Freshwater Fish from Florida Waters

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>COUNTY</th>
<th>SPECIES</th>
<th>Woman of childbearing age, young children NUMBCK OF MEALS*</th>
<th>All other individuals NUMBCK OF MEALS*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerojet Canal [see Canal C-111]</td>
<td>Miami-Dade</td>
<td>Spotted sunfish</td>
<td>One per week</td>
<td>Two per week</td>
</tr>
<tr>
<td>Alafia River</td>
<td>Hillsborough, Polk</td>
<td>Largemouth bass</td>
<td>One per month</td>
<td>One per week</td>
</tr>
</tbody>
</table>
What mercury levels are set for the U.S. commercial seafood industry?

- U.S. Food and Drug Administration has an **action level** of 1 ppm for mercury.

- Acceptable Daily Intake (ADI): A level of exposure for the general population that is deemed to be without appreciable risk over a lifetime for overt, neurological effects.
More than 90% of the seafood eaten by Americans comes from 10 main varieties

1. Shrimp
2. Canned tuna
3. Salmon
4. Alaskan Pollock
5. Tilapia
6. Pangasius
7. Catfish
8. Crab
9. Cod
10. Clams

Most commercial fish in the U.S. contain MeHg levels ranging from .01ppm-.5 ppm

Source: National Fisheries Institute based on NMFS raw data
Does farm-raised seafood generally have high levels of mercury?

No.

Farm-raised fish are often:

- harvested younger
- fed a controlled diet
- not large, predatory species

The current U.S. seafood supply is increasingly relying on aquaculture to meet its growing demands.
Can seafood be prepared in a certain way to minimize the amount of mercury in it?

No.

Mercury accumulates in the muscle tissue of the fish and shellfish we eat. Removing the skin or preparing it in a certain way, will not reduce the amount of mercury present.

Image credit: NOAA
What role does selenium play in mercury toxicity?

- Mercury can combine with selenium, preventing selenium from functioning
- If there is sufficient selenium to maintain proper body function, the risks from mercury are diminished
- It is more important to look at mercury to selenium ratios that mercury levels themselves

http://www.undeerc.org/fish/
Take Home Messages

- Most seafood consumed in the U.S. have low mercury levels.
- The risks associated with not eating seafood are greater than the health risks associated with mercury in seafood.
- The current FDA guidelines provide recommendations on how to obtain the benefits that fish can provide to the fetus and young children while minimizing any effects from methylmercury.
- Following the recommended dietary guidelines of eating two servings of a variety of seafood per week provides net health benefits for the entire population.
Resources

Seafood Health Facts: Mercury in Seafood

- Consumers and Patients
- Healthcare Professionals
- Scientific Publications and References

Fish, Mercury, and Nutrition: The Net Effects (Video)

U.S. FDA: Mercury Levels in Commercial Fish and Shellfish (1990-2010)

U.S. EPA: Mercury

EPA-FDA Joint Federal Advisory for Mercury in Fish: “What You Need to Know About Mercury in Fish and Shellfish

Florida Department of Health: Fish Consumption Advisories
Thank You!

Please do not forget to complete the online evaluation

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