



Seafood Consumption During Pregnancy: Understanding and Managing Risk

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The Risk of Concern Has Been Methylmercury

- ✓ **MeHg is a neurotoxin**
 - *The unborn child is generally more sensitive to it than the adult*
- ✓ **MeHg is essentially in all commercial fish**
- **Is eating commercial fish during pregnancy causing harm to unborn children in the U.S.?**
 - Always? Sometimes? Never? And if so, how much harm?



U.S. Fish Consumption Advice

- **Message:** *To pregnant women, women who might become pregnant, nursing mothers, and young children on what & how much fish to eat to limit their exposures to MeHg.*
 - Avoid 4 commercial species with the most MeHg.
 - Do not eat more than 12 ounces/week (340 g) of other commercial species.
 - Do not eat over 6 oz/wk (170 g) of albacore tuna.
- Most recent advice was issued in **2004**.

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What We Did Not Know When We Issued That Advice in 2004

- **The Risk** (i.e. likelihood and severity of harm) from MeHg in commercial fish.
- **In particular:** The likelihood and severity of harm to unborn child when fish consumption during pregnancy is:
 - higher than 12 oz/wk (340 g);
 - equal to 12 oz/wk (340 g); or
 - less than 12 oz/wk (340 g).

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More We Did Not Know: From Research Published After the Advice

- Eating fish during pregnancy would become associated with improved neurodevelopment in offspring.
(6 of 6 studies)

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More From Research Published After the Advice

12 oz. fish/week Became a Research Target

- Eating more than 12 oz (340 g) fish/wk during pregnancy would become associated with improvements rather than with deficits.
(4 of 4 studies that examined that question)
- Also, eating more than 12 oz (340 g) fish/wk would be associated with greater benefits than eating less than 12 (at least under some circumstances).

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More From Research Published After the Advice

But on the other hand...

- **Beneficial effect** apparently does not increase indefinitely in proportion to consumption.
 - 3 studies produced evidence of a “plateau”
- **MeHg** can adversely affect the outcome. (3 of 4 studies that examined that question.)
 - Can cause effect to be a smaller benefit; or...
 - Can replace benefit with adverse effect.

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Take-Aways (1)

- The overall effect (i.e., the “**net effect**”) of fish consumption on fetal neurodevelopment appears to include an adverse contribution and a beneficial contribution.
 1. **Adverse**: MeHg
 2. **Beneficial**: presumably from one or more nutrients in fish, with omega-3’s being potential candidates.

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Take-Aways (2)

- The beneficial contribution seems to be greater initially, at least for many species.
- The beneficial contribution increases with consumption until a benefits “plateau” is reached.
- That plateau is probably at no less than circa 12 oz (340 g)/wk.

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Take-Aways (3)

- **MeHg can affect outcomes.**
 - Fish lower in MeHg can be more beneficial than fish higher in MeHg.
 - A diet that emphasizes fish high in MeHg can be net adverse.

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Potential Effect on Advice

- **Focus of U.S. advice in 2004:**
 - How pregnant woman can *minimize risk* to the developing nervous system from methylmercury without avoiding fish.
- **How we could re-focus that advice now:**
 - How pregnant woman can *maximize benefit* to the developing nervous system from fish while minimizing risk from methylmercury.

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First Attempt in U.S. (Gov't): *Dietary Guidelines for Americans, 2010* (HHS/USDA)

- Added a minimum consumption target:**
Pregnant women should eat 8-12 oz/wk. of varieties low in MeHg for improved infant health outcomes, e.g., visual & cognitive development.
- Other aspects of the advice are the same as in FDA/EPA 2004 advice.
 - E.g., avoid same 4 high-MeHg species.

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Growing Interest in Updating the 2004 Advice

- **Two main concerns:**
 1. We could be doing more harm than good;
 - FDA survey: pregnant women eating 1.9 oz/wk
 2. 2004 advice and Dietary Guidelines are inconsistent.
- **We get letters:**
 - 3 from over 150 scientists & others;
 - 5 (4 to us; 1 to President Obama) from 30 U.S. Congressmen & Senators

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How Updating Can Be Done

- **Take into account results from the new research.**
- **Quantitatively assess the net effects on fetal neurodevelopment from eating fish during pregnancy.**
 - Calculate dose-response for the adverse MeHg effect
 - Calculate dose-response for beneficial “fish” effect.
 - Combine the two to calculate dose-response for the net effect

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What We Are Doing

- FDA published a draft quantitative assessment of the net effects of fish consumption in 2009.
- FDA is now consulting with the U.S. EPA on:
 - Updated assessment;
 - Consumption advice.
- Goal: complete FDA/EPA consultation this year.
- Obtain public input immediately thereafter.