Published in final edited form as:

JAMA Pediatr. 2018 September 01; 172(9): 801–802. doi:10.1001/jamapediatrics.2018.1619.

Fish Consumption During Pregnancy:

An Opportunity, Not a Risk

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Advice issued in 2017 from the US Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA)¹ recommends consuming 224 to 336 g (8–12 oz) (2–3 servings) per week of most types of commercially available fish during pregnancy, stating that “Fish and other protein-rich foods have nutrients that can help your child’s growth and development.” The 2017 advice recommends consumption of 2 to 3 servings of fish because of unspecified benefits for “growth and development.”

The 2017 advice differs from the advice last issued by the FDA and EPA in 2004, which focused solely on limiting fish consumption during pregnancy to minimize possible risks to the fetus from methylmercury.² Under the 2004 advice, pregnant women could eat 336 g (12 oz) of fish weekly, but they could also adhere to the advice by eating little or no fish.

It is a positive step to recommend a minimum fish consumption during pregnancy. Only 10% to 20% of US women eat as much as 224 g (8 oz) of fish per week.³ Pregnant women consume even less fish per week (50.4 g [1.8 oz]),⁴ with 10% to 20% of pregnant women consuming no fish.³

However, the new advice from the FDA and EPA did not identify—but should have—the benefits to neurocognitive development of fish consumption during pregnancy. The science underlying the benefits of prenatal fish consumption to neurocognitive development is

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Additional Contributions: Joshua Sharfstein, MD, Johns Hopkins School of Public Health, former Principal Deputy Commissioner for the US Food and Drug Administration, former Maryland Secretary of Health and Mental Hygiene, assisted in crafting and writing this work. He was not compensated for his contribution.

Conflict of Interest Disclosures: Messrs Spiller and Landa reported being former US Food and Drug Administration (FDA) officials and petitioning the FDA to reissue the advice that grouped fish into 3 categories according to assumed risk from methylmercury rather than grouping fish according to neurocognitive benefit.

strong, as summarized in a 2015 systematic review by Starling et al.⁵ Clinicians should recognize the importance of informing pregnant women of these benefits.

Benefits to Neurodevelopment and IQ

The European Food Safety Authority (<http://www.efsa.europa.eu/en/efsajournal/pub/3761>), the World Health Organization (WHO), the Food and Agriculture Organization of the United Nations (FAO) (<http://www.fao.org/docrep/014/ba0136e/ba0136e00.pdf>), and others highlight improved neurodevelopment as a specific benefit to fish consumption during pregnancy. Research indicates that prenatal exposure to the nutrients in fish improves neurocognitive development, including IQ, communication, and other developmental outcomes.^{6,7} Children whose mothers consumed a mean of 588 g (21 oz) of fish per week, the fourth highest quintile of consumption in the study population, had higher total scores for verbal, motor, memory, and overall cognitive development (Table).^{6–8}

Assessments by the FDA and international experts brought together by the FAO and WHO calculated that optimal fish consumption during pregnancy can increase IQ by 3 to 5 points.³ Although maximum benefits to IQ can be obtained from consumption of 224 to 336 g (8–12 oz) of fish per week, consumption of 112 to 168 g (4–6 oz) of fish per week by pregnant women can provide as much as 70% of the maximum possible neurodevelopmental benefit.³

Unlike with fish consumption, the Agency for Healthcare Research and Quality determined there is no consistent evidence that taking ω -3 dietary supplements during pregnancy benefits neurocognitive development (<https://effectivehealthcare.ahrq.gov/topics/omega-3-maternity/research>). The reason for this distinction between supplements and fish is not fully understood. The assessment by the FAO and WHO postulated that other nutrients in fish, not just ω -3 fatty acids in isolation, contribute to neurocognitive benefits.³

Unjustified Fears

The major factor limiting fish consumption during pregnancy has been fear of exposure to mercury.⁴ Excessive methylmercury can be harmful to neurocognitive development, and methylmercury is present in most fish. This concern was a key factor in the development of the 2004 advice.

However, empirical evidence published since 2004, as well as the FDA and FAO and WHO assessments, indicate that fish consumption beyond what most people eat would be necessary for exposure to become harmful.^{7,9} One study followed a large prospective observational cohort of mothers and their children in the Seychelles to assess mercury exposure and developmental outcomes 10 times during a 24-year period. Follow-up included assessments of attention, mood, language, cognition, and neuropsychologic function.⁹ These outcomes were not negatively associated with a mean prenatal mercury exposure that was more than 10 times the typical levels in the United States.⁹ A study conducted in the United Kingdom analyzed umbilical cord blood from 1054 mothers and showed no significant increase in mercury levels between mothers consuming 1 serving of fish every 2 weeks vs those consuming 4 or more servings of fish per week, and that increasing mercury levels were not associated with poorer developmental outcomes.⁶ A study in Spain found that, of

1683 children, 65% had prenatal mercury levels above the 95th percentile of typical US levels, and there was no significant association with this mercury exposure and decreased mental or psychomotor development at 14 months.¹⁰

Despite these and other studies showing very low risk from mercury exposure with large amounts of fish consumption, the 2017 advice groups fish into 3 categories according to assumed risk from methylmercury, rather than grouping fish according to neurocognitive benefit. Mercury is in most, if not all, fish, and the grouping implies major differences in the risk from mercury in the advice's first 2 groups of fish. In May 2017, former FDA officials and other scientific experts petitioned the FDA to withdraw the advice, revise it to focus on neurodevelopmental benefits rather than neurodevelopmental risk, test it with consumers, revise it as needed, and reissue it. In October 2017, the FDA denied the petition, stating that the petitioners did not show that the advice would not accomplish its goal. In November 2017, the petitioners asked the FDA to reconsider its denial of the petition.

The third group in the advice from the FDA and EPA lists 7 fish to avoid eating during pregnancy because of high mercury levels in these fish (shark, swordfish, king mackerel, tilefish from the Gulf of Mexico, orange roughy, marlin, and bigeye tuna).³ There is justification for highlighting these 7 fish to avoid, given their known levels of mercury and weak neurocognitive benefit.³

Opportunities for Clinicians

Clinicians can educate women that there are neurocognitive benefits to eating fish during pregnancy, information that is highly motivating.⁴ Clinicians can also explain that evidence is strongest for the neurocognitive benefits from fish consumption during pregnancy, more so than during lactation (both time periods are mentioned in the 2017 advice).

Clinicians can further explain that the risk of too much mercury is low if women eat 2 to 3 servings per week of fish other than those on the list of 7 fish to avoid eating during pregnancy. Pregnant women are risk averse and motivated to make changes that will improve the health of their developing children.⁴ It is possible that the new advice from the FDA and EPA, by grouping all fish according to an implied risk without explaining that the risk is remote, could dissuade women from eating the full recommended amount of fish, or any amount, because of safety concerns.

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Small Sample of Studies That Examine Neurocognitive Outcomes in Children Based on Fish Consumption by the Mother During Pregnancy

Table.

Source	Participants, No.	Follow-up	Statistically Significant Results	Weekly Fish Consumption
Daniels et al, ⁶ 2004	7421	15 mo	OR of 1.5–1.7 for the highest social and comprehension scores on the McArthur Communication Development Inventory	1–3 servings
Hibbeln et al, ⁷ 2007	11 875	18 mo	OR of 1.2–1.4 for the highest score on the Denver Developmental Screening Test	1–3 servings
		8 y	OR of 1.78 (unadjusted), OR of 1.29 (fully adjusted) for an IQ in lowest 25th percentile	For none vs 336 g (12 oz, or 3 servings)
		7 y	OR of 1.69 (unadjusted), OR of 1.19 (fully adjusted) for lower total behavioral score on the Strength and Difficulties Questionnaire	
Julvez et al, ⁸ 2016	1589	5 y	2.84 (fully adjusted) to 3.6 (minimally adjusted) points higher on the McCarthy General Cognitive Scale, and 0.61 points lower on Childhood Asperger Syndrome Test	For a median of 588 g (21 oz, or 5.25 servings) vs more or less

Abbreviation: OR, odds ratio.