Testimony of
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On behalf of the
American Academy of Pediatrics

Before the
Food and Drug Administration
Meeting of the Risk Communication Advisory Committee

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My name is Dr. Aaron Bernstein, and I am a member of the American Academy of Pediatrics Council on Environmental Health. I am also the Associate Director of the Center for Health and the Global Environment at the Harvard School of Public Health, and a pediatric hospitalist at Boston Children's Hospital. I am here today in an official capacity representing the American Academy of Pediatrics (AAP), a non-profit professional organization of 62,000 primary care pediatricians, pediatric medical subspecialists, and pediatric surgical specialists. Thank you for the opportunity to provide comments regarding seafood consumption and children’s health.

Fish and shellfish consumption choices are laden with considerations for childhood health: the many health benefits of such consumption, as well as potential exposure to toxins such mercury, dioxins, and PCBs. In addition, fish stocks worldwide have been largely depleted because of unsustainable consumption, adding another consideration to seafood choices.

FDA’s June 2014 seafood consumption advisory was an important update for health professionals, parents and caregivers. As pediatricians, we strive to communicate clearly to our patients and their families both the health benefits and the health concerns related to fish and shellfish consumption, and this advisory has been helpful in that regard. However, we see important opportunities to further improve the advisory to make it even clearer to parents and caregivers and to ensure adequate consumption of low-mercury fish and shellfish.

**Patient Counseling and the Health Benefits of Fish and Shellfish Consumption**

In general, the following is the counseling that pediatricians have been providing to patients and their families regarding fish and shellfish consumption:

a. Eat a variety of fish and shellfish;

b. Eat domestically-raised fish and shellfish, using Country of Origin Labeling to identify it;

c. Avoid fish and shellfish higher in mercury; and

d. Try to consume small oily fish, such as sardines and anchovies, which are particularly beneficial to children and for which kids can be taught early to develop a taste.

Research shows that there are a number of health benefits of fish and shellfish consumption. Almost all fish and shellfish provide excellent overall nutrition for children. All fish are protein dense, and have little or no sugar or saturated fat. Some fish provide excellent sources of omega-3 fatty acids, ‘good fats’. Many species contain high levels of vitamin D and calcium. Some shellfish species have high iron content. Other trace nutrients, such as selenium and iodine are present in some fish and shellfish as well. The nutritional benefits make fish and shellfish important for growth and development before
birth, in early infancy for breastfed infants, and in childhood. Fish is also beneficial to pregnant and breastfeeding women, and those who may become pregnant. In adults, a diet high in fish has been shown to promote cardiovascular health, and has been recommended as part of the 2011 National Heart, Lung, and Blood Institute (NHLBI) Integrated Guidelines for Cardiovascular Risk Reduction in Childhood.

We are concerned that amid the important discussion of mercury exposure from some fish and shellfish, certain health benefits of consumption of these foods may be getting lost, and parents may be substituting other, less nutritious animal protein sources as a result, or moving towards more carbohydrate-based diets that may promote obesity. Below, we discuss the health benefits of fish and shellfish that we believe must have a greater presence in conversations about consumption, especially for children.

**Prevention of Allergic Disease**

Many studies have examined the potential of fish and shellfish consumption to prevent certain allergic diseases. For example, early introduction of seafood prior to a year of age may protect children from developing eczema, asthma, and food allergies – conditions which affect hundreds of thousands of children in the United States and which have all had substantial increases in their prevalence in recent decades. In one prospective study of more than 4,000 Swedish infants, Inger Kull and colleagues found a dose-dependent reduced risk for asthma, eczema, allergic rhinitis and sensitization as well as an inverse association between age at introduction of fish and allergy risk. Children receiving fish between 3 and 8 months of age were roughly 25% less likely to have asthma (OR$\text{adj}0.73$, 95% CI 0.55–0.97), eczema (OR$\text{adj}0.77$, 0.64–0.92), allergic rhinitis (OR$\text{adj}0.77$, 0.60–0.97), and show evidence of food allergy (OR$\text{adj}0.78$, 0.64–0.95) compared with children introduced to fish at 9 months or older. Remarkably, the benefits to these children, who ate two or more fish meals per month by age 1 persisted to 12 years of age. Several other research studies have corroborated the potential for early fish consumption having durable protective effects.

Of note, some evidence suggests that shellfish consumption in early childhood may increase risk of food allergy. We are also happy to discuss these studies upon request, as this is an important consideration.

**Cognitive Development**

A substantial body of research now documents the benefits to the developing brain in utero when pregnant women consume fish during pregnancy. A study of more than 11,000 pregnant women, for instance, found that those who ate less than 340g/week of seafood were 50% more likely to have a child with significant deficits in verbal intelligence. This same study found that inadequate maternal seafood consumption was associated with children having problems with social interactions and fine motor development.
Oken has studied a group of more than 25,000 children and found that if their moms ate more seafood, they were much more likely to do better than their peers on a host of developmental tasks. These findings and others, which show that expecting moms who don't eat seafood may be more likely to have children with poor developmental outcomes, are consistent with the developing brain's need for long-chain omega-3 fatty acids that come primarily from eating fish.

Health and Sustainability Concerns Regarding Fish and Shellfish

Providing good guidance would, of course, be easy if fish and shellfish consumption only conferred the nutritional and other benefits just described. However, these must be reconciled with the known toxic substances found in fish and shellfish including PCBs, dioxins and, importantly mercury, as well as worries about the dwindling populations of fish around the world.

Mercury pollution is a primary reason for parents to avoid feeding their children fish and for expectant mothers to avoid fish consumption during pregnancy. Available evidence indicates that prenatal and, to a lesser extent in most cases, postnatal mercury exposure has been associated with decrements in memory, attention, language, IQ and visual-motor skills in childhood. 5-7

Mercury enters the environment primarily through burning coal and from artisanal and small scale gold mining. Bacteria convert elemental to organic (methyl) mercury, a much more toxic form to humans. Methyl mercury bioaccumulates through marine and freshwater food chains and ultimately, into people. The human mercury burden comes overwhelmingly from eating fish. It must be noted that given the increased use of coal for energy in recent decades, especially in Asia, mercury levels in the world’s oceans have risen substantially, and are expected to increase much more, with a possible doubling by 2050 from 1995 levels. 8

Other pollutants have been found in fish, including polychlorinated biphenyls (PCBs) and dioxins. PCBs are chemicals that were manufactured primarily for industrial uses and can adversely affect the developing fetus and have been associated with thyroid problems, lowered IQ, and memory impairment. Given these concerns, among others, they were banned in the U.S in the late 1970s. However, they have persisted in the environment, contaminating water, soil, and air, and have made their way into fish and, as a result, humans.

A dioxin is a member of a class of chemicals that originate from combustion, metal smelting, industrial refining and processing, and chemical manufacturing. Dioxins are highly toxic substances known to cause reproductive and developmental problems, damage the immune system and cause cancer. Dioxin levels in the U.S. have declined substantially in recent years owing to regulations and are expected to continue to fall. Dioxins are
present in fish, especially fresh water fish; however, the levels in general are far lower than in beef and butter.

In addition, increasing concerns are being raised about the sustainability of fish populations. More than 80% of fisheries are maximally or over-exploited, according to the Food and Agriculture Organization of the U.N., and many fisheries in the major ocean basins of the world have entirely collapsed, such as the once great cod fishery of the Grand Banks of Newfoundland.

**Conclusion**

Fish and shellfish should be among the wide varieties of foods consumed by children because they are a good source of inexpensive, low fat protein, and are rich in omega-3 fatty acids, vitamin D, and calcium that may prevent long term allergic disease, improve cognitive development and have other long-lasting benefits to children. AAP encourages FDA to continue to offer guidance to the American public on how to enjoy fish and shellfish that are lower in mercury and other pollutants, but also to amplify these beneficial health messages regarding consumption, and to include consideration of seafood sustainability in its guidance.

Given the many dimensions that must be considered related to seafood consumption for Americans, we also encourage FDA to deliver more detailed information for pediatric healthcare providers to help them counsel their patients and families as to how best to navigate seafood choices.

AAP looks forward to working with the Advisory Committee and with the FDA to ensure that children and their families are receiving clear, helpful information regarding consumption of fish and shellfish. Thank you for the opportunity to speak to you today and I look forward to any questions you might have.
References


