

New Study Provides Reliable Seafood Consumption Guidelines

Understanding the benefits and safety of eating ocean fish

Grand Forks, North Dakota (9 June, 2009) - A study released this week by the University of North Dakota shows that current Food and Drug Administration methods for formulating seafood consumption guidelines may not provide a reliably accurate assessment of seafood safety.

Results of the study; *Selenium-Health Benefit Values as Seafood Safety Criteria*, reported in the journal, *EcoHealth*, (volume 5, number 4, pages 442-455) indicate that when mercury levels are measured in fish, the levels of the essential dietary mineral selenium also need to be considered. Since only mercury levels in fish are presently being assessed, evaluations of risk from ocean fish consumption are being overstated, and conversely, risks from eating fresh water fish from some locations may be much greater than is currently assumed.

Selenium is an essential nutrient that is required for health of the brain and hormone producing tissues. Mercury binds to selenium with an incredibly high affinity, preventing it from doing its essential functions in the body, especially the brain.

The research team lead by Dr. Nicholas Ralston has previously demonstrated that laboratory animals fed diets with selenium levels approximately equal to those present in ocean fish are more than enough to protect against adverse effects from mercury contents that are many times greater than those that actually occur in ocean fish.

“Since selenium and mercury occur together in seafood but affect health outcomes in opposing directions, it is essential to look at the balance of these elements present in fish,” says Ralston.

The study examined a new seafood safety criterion known as the Selenium-Health Benefit Value (or Se-HBV) that predicts risks or benefits of seafoods based on their relative mercury and selenium contents. Foods that contain disproportionately high amounts of mercury have negative Se-HBV's and need to be completely avoided during pregnancy.

However, foods with positive Se-HBV's provide mothers with the selenium their babies need in order to develop healthy brains. Fortunately, only a few seafoods have negative Se-HBV's. For example, among mothers that eat meats of pilot whales; -85, and large sharks estimated between -11 and -100, increasing exposures have been found to harm their unborn children. However, most other varieties of ocean fish have highly positive Se-HBV's that are expected to promote child health.

Predictions based on Se-HBV's coincide with findings that children of mothers that eat ocean fish enjoy substantial IQ benefits of up to 10 IQ points. Previous warnings regarding fish consumption have been based on worst case scenarios projected based on adverse effects of mothers eating foods with negative Se-HBV's.

“Seafood safety criteria based on the Se-HBV will improve protection of public health by properly restricting consumption of hazardous seafoods such as pilot whale and shark meats while improving public health by encouraging mothers to eat types of ocean fish that optimize their nutritional status and enhance the IQs of their children,” says Ralston.

Proponents of the study, which was funded by the National Oceanic and Atmospheric Administration (NOAA) and the Environmental Protection Agency (EPA), hope the findings will lead to a more balanced approach to seafood consumption guidelines. Particularly those pertaining to pregnant and nursing women.

About the Selenium-Health Benefit Value Study

The Selenium-Health Benefit Value Study (Se-HBV) was proposed by Dr. John Kaneko and Dr. Nicholas Ralston (*Biol. Trace Elem. Res.* 2007, 119, 242–54) to provide a reliably accurate and easily understood assessment of seafood safety for consumers.

Because it considers both the health benefits of selenium as well as risks of methylmercury, the Se-HBV index provides far more accurate predictions of seafood benefits and safety than current criteria which are based on mercury alone.

Pilot whale meats that were eaten by mothers in the Faroes study that form the basis of current U.S. Environmental Protection Agency advisories regarding seafood safety. However, studies of the effects of maternal ocean consumption are finding IQ benefits of up to 10 points in children of mothers that eat increasing amounts of ocean fish.

What is Selenium?

Selenium is an essential mineral nutrient required for vital bodily processes that are especially important in the brain and hormone producing tissues. Once in the body, selenium becomes incorporated in enzymes (selenoenzymes) that provide vital antioxidant protection in the brain in addition to aiding thyroid and immune system function.

Ocean fish are particularly rich in selenium. Out of 1,100 foods that have been analyzed for selenium by the U.S.D.A., ocean fish comprised 17 of the 25 best dietary selenium sources.

What is Mercury?

Mercury is a naturally occurring element that originates from geothermal sources, but once released into the air, it is rapidly distributed around the world until it falls to the ground where it accumulates in plants and animal materials. Mercury present in these materials is released back into the air when these materials are burned in grass or forest fires, or become retired from circulation if they become buried. Large amounts of mercury released from volcanic activities during prehistoric times became retained in fossilized materials that turned into coal.

When coal is burned, the mercury that had been fossilized in these materials for millennia is released back into the air and becomes actively distributed throughout the environment once more. Airborne mercury that deposits and accumulates in plants and animals becomes more concentrated in the food web, especially in aquatic environments. As a result, nearly all fish and shellfish contain traces of methylmercury. However, larger and older predatory fish have the highest levels of methylmercury.

Available for Interview

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