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Researchers link dietary supplement DHA to higher fat-free body mass in children

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University of Kansas researchers have reported that pregnant women who consumed a supplement of DHA (docosahexaenoic acid), a nutrient added to U.S. infant formulas since 2002, tend to have children with higher fat-free body mass at 5 years old.

The Developmental Origins of Health and Disease relates to effects of maternal and early life programming on later health. The findings of the experimental study, presented in the most recent issue of the *American Journal of Clinical Nutrition*, suggest that improving maternal DHA nutrition has a favorable programming effect on the fetus that influences body composition in early childhood.

"DHA is a nutrient found in the highest concentrations in oily fish such as salmon and tuna, foods many Americans don't eat a lot of, so they tend to get low intakes," said Susan Carlson, professor in the Department of Dietetics & Nutrition in the School of Health Professions. "Because U.S. intakes are low and because DHA is highly concentrated in the brain where it increases dramatically in the last trimester of pregnancy and the first two years of life, I have had a long interest in whether more of this nutrient is needed for optimal health during early development. DHA can be delivered to the fetus by increasing maternal intake during pregnancy and to the breast-fed infant by increasing maternal intake during lactation, which increases DHA in mothers' milk."

Women with low-risk pregnancies in the Kansas City area were enrolled in the study at KU Medical Center's Maternal and Child Nutrition and

Development Lab between March 2006 and September 2009. Half were randomly assigned to a prenatal DHA supplement of 600 milligrams, and half were given a placebo.

Five years later, children resulting from those pregnancies were tested using the BodPod, which uses air-displacement to determine body fat and fat-free mass. The researchers found the children whose mothers took the DHA supplement during pregnancy had an average of 1.3 pounds more fat-free mass but the same amount of fat at age 5 compared with the placebo group.

"While we don't know the mechanism for the finding, DHA is an omega-3 fatty acid. We do know that the balance of omega-3 and omega-6 fatty acids early in development can influence the balance of muscle and fat cells," Carlson said. "The number of muscle fibers is believed to be set by term birth."Carlson's co-author, John Colombo, professor of psychology and director of KU's Life Span Institute, noted the paper makes two important contributions to the field.

"The first contribution is about the effects of DHA," he said. "We've known for a long time that DHA is associated with improvements in visual, cognitive and behavioral development in early life, but these results suggest that DHA may also have a role in promoting a leaner, healthier growth outcome for children.

"The second contribution is actually more profound. If you think about it, our results show the conditions that children experienced during the time that their mothers were pregnant with them are associated with their physical characteristics almost six years later. To me, that's astonishing—staggering, really. Those of us working in the field of developmental science are seeing results that suggest the prenatal environment and prenatal conditions have meaningful, long-term effects on human development. Quite simply, these results add to that mounting

evidence. I think we'll learn that much more of how we 'end up' may be strongly influenced or determined by what happens before we are born."

The study's other authors are Brandon Hidaka, Jocelyn Thodosoff, Elizabeth Kerling and Holly Hull of the Department of Dietetics & Nutrition at the University of Kansas Medical Center.

Carlson said the results agreed with another study undertaken in the United Kingdom, and she suggested pregnant women seeking to increase their intake of DHA wouldn't have to look far to find good sources.

"There are currently many prenatal supplements with DHA," she said. "They also can increase their intake of oily fish like salmon and tuna."

More information: Brandon H Hidaka et al. Intrauterine DHA exposure and child body composition at 5 y: exploratory analysis of a randomized controlled trial of prenatal DHA supplementation, *The American Journal of Clinical Nutrition* (2018). DOI: 10.1093/ajcn/nqx007

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