Eat fish, build up brainpower

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Can pregnant women help boost their children's brainpower by eating fish? The findings of a study, presented in the *American Journal of Clinical Nutrition*, show how children born to women who consumed more fish during their pregnancies demonstrated improved outcomes in tests for verbal intelligence, fine motor skills and prosocial behavior.

Oily fish is the leading source of long-chain omega-3 fatty acids such as docosahexaenoic acid (DHA), a key structural component of cells and particularly the cell membranes of the brain. The European Commission supports health claims that DHA 'contributes to the normal brain development of the foetus and breastfed infants and to the normal

development of the eye of the foetus and breastfed infants'. (*EFSA Journal* 2011;9(4):2078)

In the NUTRIMENTHE study, the researchers investigated how fish mediate the effect and genetic variation on brainpower. The project partners focused primarily on polymorphisms in the fatty acid desaturase (FADS) gene cluster that codes for the enzymes delta-5 and delta-6 desaturase involved in the synthesis of omega-3 and omega-6 fatty acids.

Using blood samples taken from more than 2 000 women at 20 weeks of pregnancy and from the umbilical cord at birth, researchers assessed omega-3 and omega-6 fatty acids and the genotyping of 18 FADS single nucleotide polymorphisms. The team supplied omega-3 and omega-6 fatty acids to the developing child by placental transfer via the umbilical cord. How maternal and child FADS genotypes impact the levels of these fatty acids had not been investigated until now.

Dr. Eva Lattka from Helmholtz Zentrum München, the German Research Centre for Environmental Health and her team discovered how polymorphisms in the FADS gene cluster affect fatty acids in women during pregnancy. According to the researchers, the composition of fatty acids in cord blood needs maternal and child genotypes, such that maternal genotypes are primarily associated with omega-6 precursors, and that child genotypes are mainly linked to omega-6 products. They also found that the DHA amounts were equally associated with maternal and child genotypes.

"There is more contribution to omega-6 fatty acid synthesis by the foetus than previously expected; DHA levels are dependent on both maternal and child metabolism,' Dr. Lattka says. 'DHA supplied by the mother might be very important."

In a previous study, researchers had found that consumption of fish

during pregnancy is associated with verbal intelligence quotient (IQ) at age 8, but what does fish have that mediates the effect? While the study identified how eating fish is associated with maternal levels of DHA, no data has emerged on whether maternal DHA levels are directly related to outcomes in children. The NUTRIMENTHE project, which is expected to end in 2013, will work at resolving this issue.

The NUTRIMENTHE partners hosted a symposium called 'Nutrition and Cognitive Function' at the European Nutrition Conference in Madrid in late October. Researchers from Belgium, Germany, Hungary, Italy, Poland, Spain, the United Kingdom and the United States are part of the NUTRIMENTHE consortium. (*EFSA Journal* 2011;9(4):2078)

More information: www.nutrimenthe.eu/

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