

## **Seafood Consumption During Pregnancy May Improve Attention Capacity in Children**

*A new study highlights the importance of eating a diet rich in lean and fatty fish during the first months of pregnancy*

Barcelona, 3 October 2019. A team of scientists from the [Barcelona Institute for Global Health \(ISGlobal\)](#), a centre supported by "la Caixa", has studied the relationship between the consumption of various types of seafood during pregnancy and attention capacity in children at eight years of age. The results, published in the *International Journal of Epidemiology*, show that eating a **seafood-rich diet during early pregnancy is associated with better attention outcomes in children.**

The study included 1,641 mother-child pairs from the [INMA Environment and Childhood Project](#), a Spanish cohort study on the role of pollutants during pregnancy and their effects on children. Over the course of their pregnancies, the mothers completed numerous food-frequency questionnaires that assessed how often they ate more than a hundred different food items, including various types of seafood. Data on the children's dietary habits were also collected using the same questionnaire at one, five and eight years of age. At eight years of age, the children also completed the Attention Network Task (ANT), a computer-based neuropsychological test designed to assess attention function. The main ANT outcomes assessed by the researchers were the number of **omission errors** committed in relation to target stimuli and the **speed of responses** to stimuli. Both outcomes are commonly used as indicators of selective and sustained attention.

The study builds on [earlier research](#) that analysed children at five years of age. "The consumption of seafood **during the first trimester of pregnancy** had a greater effect on children's attention capacity than the consumption of seafood later in pregnancy or at five years of age, by which time some neurodevelopment processes have already been completed," commented **Jordi Júlvez**, researcher in the [Childhood & Environment](#) programme at ISGlobal and lead author of the study.

Brain development takes place mainly during pregnancy, through complex biological processes such as neuron formation, synaptogenesis and myelination. Essential nutrients such as polyunsaturated fatty acids (PUFAs) play a fundamental role in these processes. "**Docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA)** are the main omega-3 PUFAs involved in neurological development, and **seafood is the main source of both of them,**" added Júlvez.

Because these nutrients participate in the definition of foetal brain structure and function, they have a large impact on later neuropsychological development. Attention is a complex behaviour that all children must learn, since it precedes other crucial functions such as memory. "We focused on the attention function because attention-deficit hyperactivity

disorder is common in school-age children,” commented **Jordi Sunyer**, head of the Childhood & Environment programme at ISGlobal.

The study also assessed the differences between various types of fish and seafood: fatty fish, lean fish, canned tuna and shellfish. Children whose mothers ate a diet rich in various types of seafood scored very well on the attention tests, as did children of women with a diet rich only in fatty fish. However, **scores were lower in children whose mothers relied on canned tuna or shellfish** for their seafood intake.

The role of genetics in PUFA metabolism was one of the elements analysed in the study. “We observed differences in the effect of seafood on children’s attention capacity as a function of genetic variations known as single nucleotide polymorphisms (SNPs),” commented Júlvez. The findings suggest that some SNPs facilitate PUFA metabolism, thereby contributing to better attention outcomes, while others have a negative effect on PUFA metabolism. Seafood consumption was shown to have a compensatory effect in children with SNPs that hinder PUFA metabolism. “Children with, for example, the rs1260326 CC genotype—which has been associated with lower PUFA levels—had worse attention scores if their mothers had not eaten much seafood during pregnancy,” commented Júlvez. “But their outcomes improved if their mothers consumed more seafood.”

### **Reference**

J. Julvez, S. Fernández-Barrés, F. Gignac, M. López-Vicente, M. Bustamante, R. Garcia-Esteban, J. Vioque, S. Llop, F. Ballester, A. Fernández-Somoano, A. Tardón, M. Vrijheid, C. Tonne, J. Ibarluzea, A. Irazabal, N. Sebastian-Galles, M. Burgaleta, D. Romaguera, J. Sunyer. Maternal Seafood Consumption during Pregnancy and Child Attention Outcomes: A Cohort Study with Gene Effect Modification by PUFA-related Genes. *International Journal of Epidemiology*, September 2019,

### **About ISGlobal**

The Barcelona Institute of Global Health (ISGlobal) is the result of an innovative alliance between “la Caixa” and academic and government institutions. The Institute was set up to contribute to the efforts of the international community to address health challenges in a globalised world. ISGlobal has consolidated a hub of excellence in research and medical care that has its roots in work first started in the world of health care by the Hospital Clínic and the Mar Health Park and in the academic sphere by the University of Barcelona and Pompeu Fabra University. The pivotal mechanism of its work model is the transfer of knowledge generated by

scientific research to practice, a task undertaken by the Institute's Education, Policy and Global Development departments. ISGlobal is a member of CERCA, the Catalan Government's network of research centres.

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