

# Gene governs IQ boost from breastfeeding

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The known association between breast feeding and slightly higher IQ in children has been shown to relate to a particular gene in the babies, according to a report this week in the *Proceedings of the National Academy of Sciences*.

In two studies of breast-fed infants involving more than 3,000 children in Britain and New Zealand, breastfeeding was found to raise intelligence an average of nearly 7 IQ points if the children had a particular version of a gene called FADS2.

"There has been some criticism of earlier studies about breastfeeding and IQ that they didn't control for socioeconomic status, or the mother's IQ or other factors, but our findings take an end-run around those arguments by showing the physiological mechanism that accounts for the difference," said Terrie Moffitt, a professor of psychological and brain sciences in Duke University's Institute for Genome Sciences and Policy.

Moffitt, who performed the research with her husband and co-author Avshalom Caspi at King's College in London, found that the baby's intellectual development is influenced by both genes and environment or, more specifically, by the interaction of its genes with its environment.

"The argument about intelligence has been about nature versus nurture for at least a century," Moffitt said. "We're finding that nature and nurture work together."

Ninety percent of the children in the two study groups had at least one

copy of the "C" version of FADS2, which yielded higher IQ if they were breast-fed. The other 10 percent, with only the "G" versions of the gene, showed no IQ advantage or disadvantage from breastfeeding.

The gene was singled out for the researchers' attention because it produces an enzyme that helps convert dietary fatty acids into the polyunsaturated fatty acids DHA (docosahexaenoic acid) and AA (arachidonic acid) that have been shown to accumulate in the human brain during the first months after birth.

Since the first findings about breastfeeding and IQ appeared a decade ago, many formula makers have added DHA and AA fatty acids to their products. The children in these studies however were born in 1972-73 in New Zealand and 1994-95 in England, before fatty acid supplementation in formula began.

Though the jury is still out on whether such supplementation has made a difference in humans, laboratory studies in which rodents and primates were fed supplemental fatty acids have shown increased brain DHA concentrations and enhanced abilities in tests of learning, memory and problem-solving.

"Our findings support the idea that the nutritional content of breast milk accounts for the differences seen in human IQ," Moffitt said. "But it's not a simple all-or-none connection: it depends to some extent on the genetic makeup of each infant."

Moffitt and Caspi joined the Duke faculty in August, but are finishing up their research in London before moving to Durham in December.

Moffitt noted that the researchers aren't particularly interested in IQ or breastfeeding, per se. Rather, this study fits into a body of work they have done on gene-environment interactions and the brain.

"We're more interested in proving to the psychiatric community that genes usually have a physiological effect," Moffitt said. "When looking at depression or intelligence, the key bit that's often left out here is the environmental effects."

Source: Duke University

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