

Breastfeeding and Brain Development (Cognitive Development)

Children who are breastfed have better neurodevelopment outcomes, and the duration of breastfeeding also affects a child's intelligence. There are three substances, which may explain the association between breastfeeding and higher scores on intelligence tests. **There are two fatty acids associated with the development of nerve cells, retina and the brain, and are present in breastmilk but are absent in infant formula and cow's milk.** These, decosahexaenoic acid (DHA) and arachidonic acid (ARA), have been shown in experiments to improve eyesight and some motor responses in infants and young children. The third, lactose, a carbohydrate, is a readily available source of galactose, which is essential in the production of the galactolipids, including cerebroside. These galactolipids are essential to CNS development. The amount of lactose in the milk of a species and the relative size of the brain varies and is the highest in human milk. The fact that lactose is found only in milk and not in other animal and plant sources enhances the significance of its high level in human milk. We are reporting studies by various workers that prove these points. Following scientific evidences clearly points out the association.

These studies done over last few years prove the point that breastfeeding enhances the neurodevelopment of infants and their intellectual and scholastic ability in later life. The increase in the IQ by breastfeeding is directly related to the duration of breastfeeding. These benefits are strongest for the infants of low birth weight on breastmilk feeding. Poor who are more likely to enter into child malnutrition are more likely to benefit from enhanced optimal breastfeeding practices.

1. Horwood LJ et al. *Breastmilk feeding and cognitive ability at 7-8 years. Arch Dis Child Fetal Neonatal Ed* 2001; 84: F23-F27.

Increasing duration of breastmilk feeding was associated with significant increases in both verbal IQ and performance IQ. Children breastfed for eight months or longer had mean verbal IQ scores that were 10.2 points higher and performance IQ scores that were 6.2 points higher than children who did not receive breastmilk. There was a significant association between duration of breastmilk feeding and long term benefits for child cognitive development.

2. Lucas A et al. *Breastmilk and subsequent intelligence quotient in children born preterm. Lancet* 1992; 339: 261-264.

300 children who had been **born preterm** were studied at age of 7-8 years. The authors discovered that those children who had been **fed breastmilk** in the early weeks of life had an **8.3-point advantage in intelligence quotient** over those who had received artificial milk. There was dose response relation between the proportion of breastmilk in the diet and subsequent I.Q.

3. Morrow-Tlucak M, Haude RH & Ernhart CB. *Breastfeeding and cognitive development in the first two years of life. Soc Sci Med.* 1988; 26: 71-82.

This study measured cognitive development in **children at the age of 2 years**. Using the Bayley scale, it showed that those breastfed for four months or less had a 3.7 point advantage over those artificially fed. Those fed for over four months were at a 9.1 point advantage. As with the above study, this study shows a **dose response relationship between the duration of breastfeeding and the subsequent I.Q.**

4. Vestergaard M et al. *Duration of breastfeeding and developmental milestones during the latter half of infancy. Acta Paediatric* 1999; 88: 1327-32.

This study suggests that **breastfeeding have a positive effect on long-term brain development**. They studied 1,656 infants at the age of 8 months to determine whether duration of breastfeeding affects mental development. Three developmental milestones were measured: crawling, pincer grip, and

polysyllable babbling. The proportion of infants who mastered the specific milestones increased consistently with increasing duration of breastfeeding.

5. Horwood LJ et al. *Breastfeeding and later cognitive and academic outcome. Pediatrics* 1998; 101(1): 91-97.

The authors studied the association between the duration of breastfeeding and childhood intelligence and academic success from 8-18 years of age. 1000 children born in New Zealand were evaluated with a series of cognitive and academic measurements from 8-18 years of age. **Persistent advantages were found among infants breastfed for more than eight months.** These children achieved higher IQs at eight and nine years, improved reading comprehension, mathematical, and scholastic ability from 10 to 13 years, and higher academic outcomes in high school.

6. Lanting CI et al. *Neurological differences between 9-year old children fed breastmilk or formula milk as babies. Lancet* 1994; 344:1319-22.

A retrospective study conducted in nine years old Dutch children fed with artificial milk exclusively or supplemented to breastmilk within the first three weeks of life were reported to have twice the rate of minor neurological dysfunction as compared to children fully breastfed at least for the first 21 days of life.

7. Lucas A et al. *A randomised multicentre study of human milk versus formula and later development in preterm infants. Arch Dis Child* 1994; 70:F141- F146.

Preterm children fed unsupplemented donor milk are substantially advantaged in their psychomotor and mental development at 18 months compared with those fed a standard formula and were not disadvantaged compared with those fed a nutrient enriched formula.

8. Anderson JW et al. *Breastfeeding and cognitive development: a meta-analysis. Am J Clin Nutr* 1999; 70: 525-535.

In the analysis of 20 studies which compared cognitive development, it was determined that **breastfeeding was associated with significantly higher scores for cognitive development than artificial feeding** and that the developmental benefits of breastfeeding increased with duration of feeding. **This benefit was strongest for children of low birth weight.** The developmental achievement persists at least through adolescence.

9. Worobey J. *Feeding method and motor activity in 3-month old human infants. Perception and Motor Skills* 1998; 86: 883-95.

It is common knowledge that breastfed infants and those who receive formulas show different speeds in physical growth. This study was conducted to find the differences in behavior according to feeding methods in the first months of life. 40 three-month old breastfed infants and 40 three-month old formula-fed infants were assessed for their motor response. The authors found that the **breastfed infants showed greater motor activity than those fed with formula.**

10. Williams C et al. *Stereoacuity at age 3.5 years in children born full-term is associated with prenatal and postnatal dietary factors: a report from a population based cohort study. Am J Clin Nutr* 2001; 73: 316-22.

The objective of this study was to compare visual acuity at age 3.5 years in healthy full-term children who were breastfed and in similar children who had not been breastfed. The results show that children who had been breastfed for 4 months were 2.77 times more likely to achieve high grade stereoscopic vision than were children who had not been breastfed. Children whose mothers ate oily fish during pregnancy were also 1.57 times more likely to achieve high-grade stereoscopic vision than were children whose mothers did not eat oily fish. The authors suggest that for full-term infants, **breastfeeding is associated with enhanced stereoscopic vision at age 3.5 years**, as also a DHA-rich maternal antenatal diet irrespective of later infant feeding practices.

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February 2005