

breastmilk was associated with a reduced risk of atopy in the infant. Vitamin E had no consistent relationship with atopy. Thus a maternal diet rich in natural food sources of vitamin C during breastfeeding can reduce the risk of atopy in high-risk infants.

Hoppu U, Rinne M, Salo-Vaeeanaenen P, Lampi A-M, Piironen V, Isolaari E. Vitamin C in breast milk may reduce the risk of atopy in the infant. *Eur J of Clin Nutr* 59: 123-128, 2005

3 REDUCED COGNITIVE DEVELOPMENT

A total of 3880 Australian children were followed from birth to determine breastfeeding patterns and later cognitive development. Those breastfed for six months or more scored 8.2 points higher for females and 5.8 points higher for males in vocabulary tests over those who had never been breastfed.

Quinn PJ, O'Callagan M, Williams GM, Najman JM, Anderson MJ, Bo W. The effect of breastfeeding on child development at 5 years: a cohort study. *J Paediatr Child Health* 37: 465-469, 2001

School-aged children (439) who weighed less than 1,500 g. at birth and were born in the USA between 1991 and 1993 were given a variety of cognitive tests. The very low-birth weight infants who had never been breastfed were found to have lower test scores in overall intellectual function, verbal ability, visual-spatial and motor skills than those who had been breastfed.

Smith MM, Durkin M, Hinton VJ, Bellinger D, Kuhn L. Influence of breastfeeding on cognitive outcomes at age 6-8 year follow-up of very low-birth weight infants. *Am J Epidemiol* 158:1075-1082, 2003

To determine the impact of exclusive breastfeeding on cognitive development for infants born small for gestational age, this US based study evaluated 220 infants, using the Bayley Scale of Infant Development at 13 months and the Wechsler Preschool and Primary Scales of Intelligence at five years. The researchers concluded that exclusively breastfed (without supplements) small for gestational age infants had a significant advantage in cognitive development without compromising growth.

Rao MR, Hediger ML, Levine RJ, Naficy AB, Vik T. Effect of breastfeeding on cognitive development of infants born small for gestational age. *Arch Pediatr Adolesc* 156: 651-655, 2002

Children of socioeconomic disadvantaged Filipino mothers were followed from birth through to middle childhood and assessed for cognitive ability at 8.5 and 11.5 years of age. After controlling for confounding variables, children who had been breastfed for 12 to 18 months had higher scores on the Philippines Nonverbal Intelligence Test. The effects were even greater for low-birth weight infants (1.6 and 9.8 points respectively). The authors conclude that long-term breastfeeding is important after the introduction of complementary foods, and even more so for low-birth weight infants.

Daniels M C, Adair L S. Breast-feeding influences cognitive development of Filipino children. *J Nutr*. 135: 2589-2595, 2005

Breastfeeding has potentially long-term beneficial effects on a person's life through its influence on childhood cognitive and educational development concludes this UK study. Regression analysis was used to determine that breastfeeding was significantly and positively associated with educational levels obtained by age 26 as well as cognitive abilities at age 53 years.

Richards M, Hardy R, Wadsworth ME. Long-term effects of breast-feeding in a national cohort: educational attainment and midlife cognition function. *Publ Health Nutr* 5: 631-635, 2002

4 INCREASED RISK OF ACUTE RESPIRATORY DISEASE

Brazilian children not breastfed were 16.7 times more likely to be diagnosed with pneumonia than children who had received only breastmilk as infants.

Cesar JA, Victora CG, Barros FC, et al. Impact of breastfeeding on admission for pneumonia during postneonatal period in Brazil: Nested case-controlled study. *BMJ* 318: 1316-1320, 1999

To determine the modifiable risk factors for acute lower respiratory infection in young children, this Indian hospital-based study compared 201 cases to 311 controls. Breastfeeding was one of the key modifiable risk factors for lower respiratory infection in children under five years of age.

Broor S, Pandey RM, Ghosh M, Maitreyi RS, Lodha R, Singhal T, Kabra SK. Risk factors for severe acute lower respiratory tract infection in under-five children. *Indian Pediatr* 38: 1361-1369, 2001

A number of sources were used to examine the relationship between breastfeeding and risk of hospitalisation for lower respiratory tract disease in healthy full-term infants with access to adequate health facilities. Analysis of the data concluded that in developed countries, infants who were formula-fed experienced more than three times the severity of respiratory tract illness and required hospitalisation compared to infants who had been breastfed exclusively for four months or more.

Bachrach VRG, Schwarz E, Bachrach LR. Breastfeeding and the risk of hospitalisation for respiratory disease in infancy. *Arch Pediatr Adolesc Med*. 157: 237-243, 2003

5 INCREASED ALTERED OCCLUSION

Breastfeed for straight teeth is the message from this research on feeding, sucking and dentition. This retrospective study of 1130 preschool children (3 to 5 years of age) looked at the impact of the type of feeding and non-nutritive sucking activity on occlusion in deciduous dentition. Detailed infant feeding and non-nutritive sucking activity history was collected by questionnaire in addition to an oral examination by a dentist.

Non-nutritive sucking activity has a substantial effect on altered occlusion, while the effect of bottle feeding is less marked. Posterior cross-bite was more frequent in bottle-fed children and in those with non-nutritive sucking activity. The percentage of cross-bite was lower in breastfed children with non-nutritive sucking activity (5%) than in bottle-fed children with non-nutritive sucking activity (13%). In conclusion, the data demonstrates that non-nutritive sucking activity in the first months of life is the main risk factor for development of altered occlusion and open bite in deciduous dentition. Children with non-nutritive sucking activity and who were bottle-fed had more than double the risk of posterior cross-bite, while breastfeeding seems to have a protective effect on development of posterior cross-bite in deciduous dentition.

Viggiano D. et al. Breast feeding, bottle feeding, and non-nutritive sucking; effects on occlusion in deciduous dentition. *Arch Dis Child* 89: 1121-1123, 2004

6 INCREASED RISK FOR INFECTION FROM CONTAMINATED FORMULA

Case report from a recent US based outbreak of *Enterobacter sakazakii* in a neonatal intensive care unit documents the death of a 20 day old infant who developed fever, tachycardia, decreased vascular perfusions and seizures at 11 days. The infant died at day 20. *E. sakazakii* cultures were identified from the spinal fluid and traced to contaminated powdered infant formula used in the NICU.

Weir E. Powdered infant formula and fatal infection with *Enterobacter sakazakii*. *CMAJ* 166, 2002

A Belgian-based outbreak of necrotizing enterocolitis (NEC) is traced back to infant formula contaminated with *Enterobacter sakazakii*. A total of 12 infants developed NEC during the outbreak and two infants (twin brothers) died.

Van Acker J, de Smet F, Muyldermans G, Bougafef A, Naessens A, Lauwers S. Outbreak of necrotizing enterocolitis associated with *Enterobacter sakazakii* in powdered infant formulas. *J Clin Microbiol* 39: 293-297, 2001

7 INCREASED RISK OF NUTRIENT DEFICIENCIES

Infants fed the same soy-based infant formula brand in Israel during 2003 were hospitalized in intensive care units with severe encephalopathy. Two died of cardiomyopathy. Analysis showed that the thiamine level of the formula was undetectable.

