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DHA in breast milk

It has long been recognised that human milk contains DHA and that it is essential for the neural and visual development of the infant (Crawford, Hassam and Stevens 1981, Gibson and Kneebone 1981). The fatty acid profile of human milk is influenced by the length of gestation and lactation period (Beijers and Schaafsma 1996) and preterm milk is richer in DHA than term milk (Luukkainen, Salo and Nikkari 1994). However, Genzel-Boroviczeny, Wahle and Koletzko (1997) found that the milk of mothers of preterm infants might not contain sufficient DHA and AA to meet the needs of the preterm baby.

The fatty acid content of human milk also depends on diet, for example, the breast milk of vegans contains relatively low levels of DHA (Sanders, Ellis, Path et al 1978, Sanders 1999) while differences in n-3 intake lead to wide variation in the DHA content of breast milk (Jensen 1999, Rodriguez-Palmero, Koletzko, Kunz et al 1999, Jorgensen, Lauritzen and Michaelsen 1999, Sauerwold, Demmelmair, Fidler et al 2000, Scopesi, Ciangherotti, Lantieri et al 2001). Similarly, a study of fatty acid composition of human colostrums demonstrated wide variation related to diet (Fidler and Koletzko 2000).

Supplementation with fish oil increases breast milk DHA concentration (Harris, Connor and Lindsey 1984, Henderson, Jensen, Lammi-Keefe et al 1992, Jensen, Lammi-Keefe, Henderson et al 1992, Makrides, Neumann and Gibson 1996b, Francois, Connor, Wander et al 1998). Experiments also demonstrate that increased breast milk DHA levels cause a dose-dependent increase in infant plasma and erythrocyte phospholipid DHA (Gibson, Neumann and Makrides 1997, Jensen, Maude, Anderson et al 2000).

As with experiments on formula feeding of term infants, investigations of the functional consequences of increasing DHA levels in breast milk have produced inconsistent results (Makrides and Gibson 2000) although most recent studies suggest benefits. Gibson, Neumann and Makrides (1997) did not find an effect of maternal DHA intake on visual acuity of breast fed infants although they did find a transient dose dependency on one measure of mental development. Jorgensen, Lauritzen and Michaelsen (1999) reported an observational study in which they found a relationship between breast milk DHA levels and a measure of visual acuity. Also in a later study, Jorgensen, Hernell, Hughes et al (2001) found that infant red blood cell phosphatidylethanolamine DHA level was significantly related to visual acuity at two months and twelve months of age while certain discrimination abilities were also related to blood DHA levels. It was concluded that DHA may influence the development of visual acuity and neural pathways associated with the developmental progression of language acquisition in term breast fed infants.

Conclusion *The DHA content of human breast milk depends on diet and can be increased with supplementation. Limited investigations suggest that such supplementation could be of benefit to both the infant and the mother.*