INFANTS AND CHILDREN WITH HIGHER DHA STATUS HAVE BETTER COGNITIVE OUTCOMES

As early as 1929, it was noted that babies that are breastfed have better cognitive outcomes than those who are artificially fed[1]. This finding has since been attributed to the DHA content of breastmilk.

DHA IS THE MOST ABUNDANT OMEGA 3 FATTY ACID IN THE BRAIN AND CENTRAL NERVOUS SYSTEM.

DHA is found throughout the body and is the most abundant Omega 3 fatty acid in the mammalian central nervous system. It is a major constituent of brain neurons where it is thought to speed up neuronal response by increasing membrane fluidity. DHA is also found in high levels in the retina as well as the frontal lobes, the brain region involved in executive function, attention, memory and language[2,3].

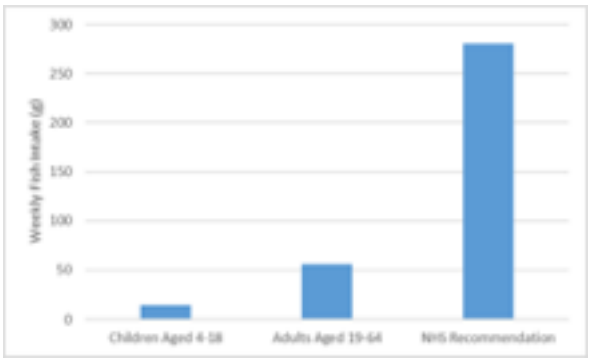
THE UK POPULATION FAIL TO EAT ENOUGH DHA, ESPECIALLY CHILDREN

Fish, particularly oily fish, is high in long chain omega 3 fatty acids which includes DHA.

The UK NHS currently recommends that we should eat 2 portions of fish per week, with one of these being oily[4].

Two major surveys of UK dietary nutrition found that these recommendations were not being met. For children aged 4 to 18 years, the weekly intake of fish is 14g, this is one-tenth of a portion (140g). Adults aged 19 to 64 years had a slightly greater intake of fish, consuming 56g per week but this is still a long way off the recommended intake[5]. This is shown in Figure 1.

Figure 1: Weekly fish intake for children aged 4-18 (14g per week) and adults aged 19-64 (56g per week) compared to the NHS recommended weekly amount[5].



STUDIES THAT DEMONSTRATE THE EFFECTS OF DHA SUPPLEMENTATION:

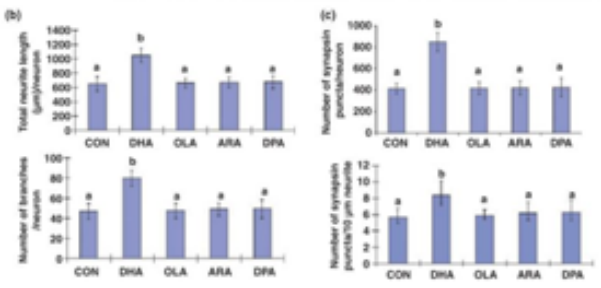
1. In 2000, brain development was studied in healthy term infants who were given formula enriched with 0.36% DHA versus those given formula not enriched with DHA (placebo). This was carried out from 5 days of age to 18 months. The group with DHA enriched formula had improved motor and cognitive development compared to the placebo group at the same age[6].

2. DHA may contribute to neuronal development in the hippocampus, an area of the brain associated with memory and learning. Animal studies have shown that DHA supplementation increases neuronal growth and the development of synapses, junctions where neurons interact. Improvements in the architecture of the hippocampus are thought to aid learning and display another potential beneficial effect of DHA supplements[7]. These findings are shown in Figure 2.

3. The rate of accumulation of brain DHA is highest in infancy, and although accumulation does continue into childhood, the rate of accumulation declines. Establishing high levels of brain DHA in childhood helps to maintain these DHA levels during later life[8].

4. A study providing 1 teaspoonful of cod liver oil per day to infants aged from 9 to 12 months found an increase in voluntary attention in a free-play test when compared to a group receiving no supplement. The results were most pronounced in boys given cod liver oil. The study also found significant associations between the child's attention and their red blood cell DHA composition[9].

Figure 2: Quantitative changes in neurite growth and branching (b) and synapsin (a protein involved in signalling between neurons) formation (c) after different fatty acid treatments. DHA shows significantly greater results than other fatty acids across all parameters above[7].



DHA SUPPLEMENTATION IN HEALTHY PRETERM BABIES IMPROVES VISUAL ACUITY

A study of preterm infants determined whether those supplemented with a marine -oil DHA oil developed better visual acuity (ability to see) vs those who were not supplemented. The results were significant up to the age of 4 months old[10].

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