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FATTY ACID SUPPLEMENTS AND SCHOOL PERFORMANCE

There is emerging evidence that diet not only affects the structure of the brain, but can influence functional aspects such as memory, learning and behaviour.¹ All of these may have a role in school performance.

Of all the dietary candidates supporting cognitive function, most interest has been devoted to long chain omega-3 fatty acids (LCn3PUFA), which include docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA). This makes sense, as the brain has a high lipid and DHA content. Grey matter is 36-40% lipid with around 15-20% of this estimated to be DHA,² white matter is 49-66% lipid, while myelin has the highest lipid content at 78-81%.³ There is far more DHA than EPA in brain tissues, but while DHA is thought to be vital as a structural fatty acid, EPA's role is potentially just as important in modulating mood, neural signalling and inflammation.⁴

A major role of LCn3PUFA in the brain is to increase membrane fluidity which enhances glucose uptake and the transmission of information between neurones.⁵ In animal models of LCn3PUFA deficiency, detrimental effects on learning, memory and behaviour have been seen, while early work on the fatty acid content of formula milk revealed that inadvertent restriction of DHA and arachidonic acid in infants' diets produced detrimental effects on IQ and vision.⁶ Low blood levels of LCn3PUFA have been found in children with attention deficit disorders and, while the association does not confirm cause and effect, fatty acid supplements that include LCn-3PUFA have demonstrated modest positive effects on behaviour and learning in children

with these conditions.⁷ In addition, in normal healthy children, better LCn3PUFA status has been associated with decreased levels of inattention, hyperactivity, emotional and conduct difficulties and increased levels of prosocial behaviour.⁸

Given the interest in helping children and young people to achieve their educational potential, this article will look at recent studies which have tested the impact of fatty acid supplementation in healthy children. The results of a consumer survey on the learning environment at home, commissioned by Equazen, will also be discussed.

REVIEW OF STUDIES

A literature review was conducted on Medline to locate all randomised controlled trials published in the last 15 years, in which LCn3PUFA supplementation had been offered to healthy children. Various cognitive and learning performance indicators were used as outcomes and are summarised alongside the studies in Table 1.

It can be seen that in seven out of nine studies, some, if not all, of the children benefited from increased LCn3PUFA intakes. Interestingly, children tended to benefit more often if they were underperforming, or if their baseline LCn3PUFA status was low. This makes sense, as it suggests that improving fatty acid status helps children to achieve their potential.

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