



SALMATE® Newsletter - Brain Development

SALMATE® is a natural source of Poly Unsaturated Fatty Acids (PUFA) such as Eicosapentaenoic Acid (EPA) and Docosahexaenoic Acid (DHA) from quality fish oil.

SALMATE® provides a balance of EPA and DHA in proportions that help provide the best physiological and cost effective results.

SALMATE® is free-flowing, starch encapsulated fish oil with an 18 month shelf life when kept in a dry, cool storage, and because SALMATE® is free-flowing it allows it to be added to a feed regime more easily than a liquid fish oil supplement.

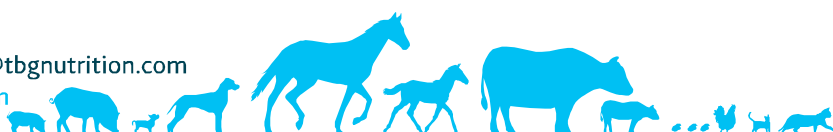
The Importance of Fatty Acids in Brain Development

Essential Fatty Acids (EFA) are essential for brain development of animals, both young and old. Young animals need EFA in their own diet as well as in the diet of the mother before birth. Recent studies have shown that the light sensitivity of the retinal rod photoreceptors is significantly reduced in newborns when there is an n-3 fatty acid deficiency. In the womb the fetus and the placenta are dependent on maternal EFA supply for their growth and development, with DHA supplemented infants showing greater mental and psychomotor development scores. (2)

Several studies have shown the role of DHA in the brain, which can be divided into properties conferred by lipid-bound DHA in the membrane bilayer and those related to unesterified DHA. The functions that are related to the membrane include those properties of the hydrophobic membrane core, such as conferring a high degree of flexibility and direct interaction with membrane proteins, which impact the speed of signal transduction, neurotransmission, and formation of lipid rafts. (1)

Unesterified DHA, on the other hand, appears to have roles in regulating gene expression, ion channel activities, and can be further metabolized to neuroprotective metabolites in the brain. These studies also suggest that DHA is important in neurogenesis and also influences phospholipid synthesis and turnover. (3)

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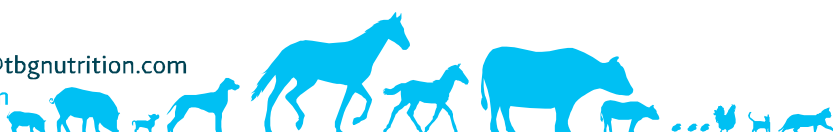


- The Brain, retina and other neural tissues are rich in long-chain polyunsaturated fatty acids
 - They serve as specific precursors for eicosanoids, which regulate numerous cell and organ functions
- Light sensitivity of retinal rod photoreceptors is significantly reduced in newborns with n-3 fatty acid deficiency;
- DHA significantly enhances visual acuity maturation and cognitive functions;
- Single-cell oil sources of long chain PUFA results in increased blood levels of DHA as well as an improvement in visual function in formula-fed infants matching that of human breast-fed infants:
 - The effect is mediated not only by the known effects on membrane biophysical properties, neurotransmitter content, and the corresponding electrophysical correlates but also by modulating gene expression of the developing retina and brain
- DHA also has significant effects on photoreceptor membranes and neurotransmitters involved in the signal transduction process, rhodopsin activation, rod and cone development, neuronal dendritic connectivity, and functional maturation of the central nervous system
- Both n-3 and n-6 LCPs play important roles in neuronal growth, development of synaptic processing of neural cell interaction, and expression of genes regulating cell differentiation and growth
- Dietary DHA is needed for the optimum functional maturation of the retina and visual cortex, with visual acuity and mental development seemingly improved by extra DHA

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- Aging is also associated with decreased brain levels of DHA
 - Fish consumption is associated with decreased risk of dementia and Alzheimer's disease
 - The reported daily use of fish-oil supplements has been linked to improved cognitive function scores
- Both n-3 and n-6 LCPs play important roles in neuronal growth, development of synaptic processing of neural cell interaction, and expression of genes regulating cell differentiation and growth
- The fetus and placenta are dependent on maternal EFA supply for their growth and development, with docosahexaenomic acid (DHA)-supplemented infants showing significantly greater mental and psychomotor development scores
 - breast-fed children do even better
- Dietary DHA is needed for the optimum functional maturation of the retina and visual cortex, with visual acuity and mental development seemingly improved by extra DHA
- Aging is also associated with decreased brain levels of DHA
- Fish consumption is associated with decreased risk of dementia and Alzheimer's disease
- The reported daily use of fish-oil supplements has been linked to improved cognitive function scores, but confirmation of these effects is needed
- Deficiency of n-3 fatty acids can modify membrane proteins' ability to bind ligands and





- activate enzymes, and alter receptor activity, antigenic recognition, signal transduction, and lateral mobility within the lipid bilayer

Benefits of SALMATE® in Brain Development for Humans and Animals

Numerous studies show a strong correlation between the amounts of Omega-3 fatty acids ingested, particularly DHA and EPA, and cognitive function, visual acuity, and total brain development. Brain development for both humans and animals is complex and occurs very rapidly during the later periods of pregnancy and the first two years of life. It is critical that adequate DHA and EPA consumption occurs in these periods of development. It is clear that n-3 EFA deprivation may affect brain development at multiple levels, from membrane biogenesis, through gene expression, protect against oxidative stress, and altered neurotransmission.(1)

Recommended intake of EPA and DHA for human brain development is at least 650mg per day. SALMATE® is an ideal medium to use in order to supply this minimum level of DHA and EPA for animals.

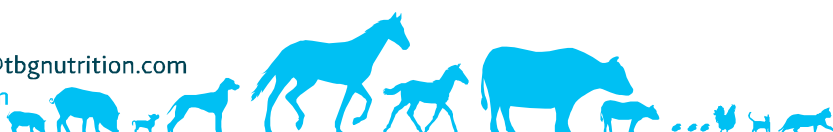
Studies have shown that an increase in DHA and EPA in diets positively affects animals and humans by:

- Enhancing visual, auditory, and sensory perception
- Increasing cognitive function
- Strengthening visual function
- Increasing muscle function



(4)

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Sources

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