Omega-3:
EPA/DHA from fish oil

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Unless one regularly feasts on salmon, sardines, herring and mackerel, fish rich in omega-3 fatty acids, avoidance or deprivation of these foods may result in unnecessary suffering during periods of growth, injury, infection and stress. It is generally agreed that a well-balanced diet that includes vitamins, minerals, fatty acids and dietary fibers can help protect us against some of today's most common diseases, including heart disease, arthritis, cataracts, Alzheimer's disease and some forms of cancer. Adherence to such a regimen may even reverse the effects of aging. Infants may be protected from the stresses of low birth weight and sudden infant death syndrome (SIDS). Suggested benefits of omega-3 fatty acids are said to include proper brain and eye development for growing children, especially for school-children with short attention span, learning disabilities and hyperactivity.

Essential fatty acids, or the "good fats that sustain wellness" have regrettably been replaced by the "bad fats" in fried foods in the Standard American Diet (SAS), according to the body of current medical research. A recent 11-year study published in 1998 showed that eating fish rich in omega-3 fatty acids at least once per week improved heart health.

Several surveys have shown that the Eskimos living on a traditional diet rich in
omega-3 fatty acids (polyunsaturated fatty acids—PUFA) from fish, seal and whale, enjoy freedom from heart disease and rarely suffer from such common conditions as arthritis, psoriasis or asthma.2

Omega-3 oils from deep ocean fish that swim free and wild, as opposed to farmed fish fed commercial food, are rich sources of EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) that help keep arteries clear, platelets less sticky with beneficial effects on blood pressure, cholesterol and triglyceride levels, kidney function, inflammatory response and immune function, according to Udo Erasmus, Ph.D.3

The human fossil record strongly suggests that early hominids had to have a rich and balanced dietary intake of long chain polyunsaturated fatty acid (PUFA) to sustain the rapid expansion of the cerebral cortex during the last one to two million years, According to an article in the British Journal of Nutrition, "We are in agreement with the ecological approach to evolution of human intelligence, and propose that nutrition played a more crucial role in the rapid neural development of genus Homo than has been considered previously. We concentrate specifically on the nutrition provided by the unique ecosystem of the East African Rift Valley lakes. The fossil evidence on record clearly indicates that Homo arose in the vicinity of these lakes, which are geologically better classified as 'proto oceans'. The diverse alkaline-freshwater fish species within those lakes provided, either directly or indirectly, a source of both protein and PUFA. In particular, the freshwater-fish lipid profile has a docosahexaenoic acid (DHA), arachidonic acid (AA) value that is closer to that in our brain phospholipids than any other food source known. We hypothesize that consistent consumption of fish, crustaceans, molluscs, and other lacustrine species from the lake margins provided a facile means of both initiating and sustaining growth of the cerebral cortex without an attendant increase in body mass. In their presentation the authors also ask, "Did hominids become intelligent enough to begin fishing, or did they fish and then become intelligent?" They suggest that the answer is likely to lie in between, "We envision something such as: hominids scavenged fish and/or fished opportunistically, which helped increase intelligence enough for them to fish more often and more successfully, they report."4

In 1996 a study published in The Lancet, found that four lake-fish species from Lake Malawi (Nyasa) are different from cold water species, like Atlantic mackerel, in that they have a different total fat content, with DHA and AA concentrations higher than EPA. The two groups of genetically-homogeneous native Bantu near Lake Malawi participated in the study. One group of 622 men and women live on the lake shore and their blood samples showed higher levels of DHA and AA. The researchers discovered that despite a higher cholesterol and saturated fat intake, the group showed lower total blood cholesterol, triglyceride levels, blood pressure levels and significantly lower risk factors for coronary heart disease than the second group of mostly vegetarians.

The other group of 686 men and women, in a rural area 75 km from the lake, live on a mostly vegetarian diet of grains, potatoes and vegetables that are locally grown. The second group had an overall higher level of omega-6 PUFA in
the form of LA (linoleic acid). However, the proportion of omega-3 long-chain PUFAs in the blood samples were three to four times higher among the people living on the shores of Lake Malawi and ingesting between 300-600g of lake-fish for most of their lives.

Included as reference values were the blood levels of Italian subjects on a typical Mediterranean diet. The coastal dwellers of Lake Malawi showed the highest DHA levels. A body of research to date verifies that the basic building material in the brain is fat and that 90 percent of total fatty acids in the body are in concentrated in the retina, adrenal glands and in the brain as DHA. Within the retina, DHA is concentrated in the lipids of the rod cells, and within the brain neurons, at the synapses, ensuring the optimal functional of brain-cell membranes essential for the transmission of nerve signals.5

Joseph R. Hibbeln, M.D., in a press release from the National Institute on Alcohol Abuse and Alcoholism, says recent studies suggest that hostility and aggression may be increased by low levels of omega-3 fatty acids, which may also reduce the incidence of depression, a risk factor in coronary heart disease. Dr. Hibbeln pointed out that the early onset of depression in the last 100 years closely follows the decreased intake of omega-3 fatty acids (such as DHA), a radical change from our 12,000 years of evolutionary history. In a related Belgian study M. Maes and colleagues found that changes in serum lipid composition may be related to suicide, major depression and immune-inflammatory responses. "Lower serum high-density lipoprotein cholesterol (HDL-C) in major depression and in depressed men with suicidal attempts: relationship with immune-inflammatory markers."6

Among the elderly the cause of Alzheimer's Disease (AD) is not known, as researchers struggle to explain it through the genetic model, the defective protein theory, infectious disease, the toxin model (e.g., aluminum), disturbances in cerebral blood flow and pronounced decrease in the acetylcholine level in the brain. Professor Shlomo Yehuda at Bar-Ilan University, Israel considered the role of the neuronal membrane whose major constituents are proteins and lipids.7 In a study of 100 AD patients, 60 were given a fatty acid compound SR-3 in a 1:4 ratio of omega-3 and omega-6 fatty acids. Forty patients were the placebo control group in the four-week double blind study.

According to the respective guardian, SR-3 treated patients seemed to improve in the following aspects: they were better able to remember their way around the house, they were more cooperative, they were in a better mood, their appetite improved and were more organized. In addition, their short and long term memory were improved and they complained less about sleep disturbances and showed longer periods of alertness during the day. Fewer SR-3 treated patients reported hallucinations and they spoke more clearly.8

If early humans and present-day humans in the Rift Valley region thrive on lake-fish for brain and cardiovascular health, then it seems that essential fatty acids (EFA) in pregnancy and early human development, "Essential fatty acids (EFA) in pregnancy and early human development, are vitally important structural elements of cell membranes and, therefore, instrumental in the formation of new tissues."9 The researchers observed that the EFA status, particularly DHA the major structural and functional EFA in the central nervous system, progressively decreases during pregnancy. Furthermore, they noted a tendency for the first-born child to have a higher DHA status than the following children. The fetal DHA status of premature infants was also found to be positively related to head circumference, birth weight and birth length.10

Fifteen healthy, pregnant women were enrolled to receive six weeks of omega-3 fatty acid dietary supplementation to determine if maternal intake of DHA from fish oil is reflected in infant plasma levels. DHA in plasma and maternal red blood cells increased at the end of the supplement period. Levels of DHA in unsupplemented mothers did not change during the same period. Blood and plasma levels of DHA in newborn infants differed greatly from infants born from omega-3 acid supplemented mothers compared with control infants. "Increased docosahexaenoic acid levels in human newborn infants by administration of sardines and fish oil during pregnancy."

A 1997 study presents the theory that a diet low in PUFAs in the third trimester of pregnancy may delay myelination and brain maturation. This may underpin learning and behavior disorders and sudden infant death (SIDS) after the first month, conditions that are associated with lower than average birth weight. The researcher observes that a growing number of women chose a low-calorie, low-fat diet especially in the third trimester when the fetus is most susceptible. Many children, especially males, show mirror CNS signs and learning/behavior disorders that could be avoided by unnecessary dieting in favor of a diet high in PUFAs. "Optimal fetal growth in the reduction of learning and behavior disorder and prevention of sudden infant death (SIDS) after the first month."11

Several studies indicate that the DHA levels in the breast milk of American women are among the lowest in the world. The U.S. Food and Drug Administration (FDA) is reviewing a proposal that infant formulas be DHA-enriched. The unresolved issue in the U.S. is should we or should we not add AA and DHA, both present in breast milk, to formula, and should we give it only to premature infants or should we include full-term babies? The World Health Organization has recommended that all infant formulas be DHA-enriched. Infant formulas in the U.K., Spain, Belgium, the Netherlands, Finland, Japan and Pacific Rim countries already include AA and DHA. ∗

References