

## Essential Fats for Mother, Infant and Child

Essential fatty acids (EFAs) are required for good health by everyone, but they are especially crucial during pregnancy and lactation, and the need during infancy and childhood remains high. This is because docosahexaenoic acid (DHA), eicosapentaenoic acid (EPA), and arachidonic acid (AA) are absolutely critical for nervous system, brain and retina development, as well as fetal growth.

### Eating for Two

“Eating for two” should be your mantra not only during pregnancy, but also if you are actively trying to get pregnant. The diet prior to pregnancy plays an important role in determining maternal EFA status. Proper development of the mammary glands, placenta and uterus, and, most importantly, fetal development, depend on sufficient levels of EFAs. The majority of essential fatty acids are absorbed by the fetus during the last trimester of pregnancy. This makes premature babies especially vulnerable for essential fatty acid deficiencies (in particular omega-3 deficiency) as they may not have had enough time to absorb them.

Fetal needs of DHA and AA are extremely high during this time because 70% of brain cell development takes place while the fetus is in the womb. The fetal liver is not mature enough to metabolize shorter chain fatty acids (such as alpha linolenic acid found primarily in flax oil) into the long-chain omega-3s (EPA and DHA found in fish oil) and is unable to supply sufficient EFAs until 16 weeks after birth. Therefore, to obtain sufficient levels of EFAs, the fetus depends on the transport of the fatty acids from the mother across the placenta. It is important for pregnant women to have adequate amounts of EFAs in their diet to cover their own requirements plus the requirements of the growing baby. If the pregnant woman is depleted of omega-3s before pregnancy, neither the mother nor developing baby will have adequate levels of omega-3s.

DHA may be most critical since women deficient in DHA may deliver pre-term, as well as low birth-weight babies, or develop behavioral or mood disorders, including postpartum depression.

### Omega-3s for Longer Gestation

Every year over 13 million babies are born prematurely across the world. It is important to identify modifiable causes of preterm delivery and fetal growth retardation, which are strong predictors of an infant’s later health and survival. There is evidence that Inuit populations, such as those from the Faroe Islands, with a high fish intake, have longer gestation periods, larger babies and reduced incidence of the potentially life-threatening condition known as pre-eclampsia (pregnancy-induced high blood pressure), compared to those populations eating less fish.

The first studies published in *The Lancet*, showed that mothers on the Faroe Islands gave birth to bigger babies than babies born in Denmark, partly due to longer gestation periods.

This observation is supported by data from a study where supplementation of omega-3 fatty acids (2.7 g/day) from the 30th week of pregnancy was associated with longer gestation (4 days) and higher birth weight (107 g heavier), compared to the control group receiving olive oil as a supplement.

### **More Fish, Higher Birth Weight**

Fish oil has been shown to have the potential to delay spontaneous delivery and prevent preterm delivery, but the minimum amount of omega-3 fatty acids needed to obtain this effect remains to be determined. Researchers from Denmark set out to investigate these issues in a study of 8,729 women whose seafood intake in early pregnancy was assessed by a questionnaire. They tested whether a low intake of seafood in early pregnancy was a risk factor for preterm delivery and low birth weight, and whether it was associated with lower fetal growth. The group found that 1.9% of women who ate fish at least once a week had a premature birth, but this increased to 7.1% among women who never ate fish. The researchers concluded that low consumption of fish was a strong risk factor for preterm delivery and low birth weight.

### **Evening Primrose Oil and Pre-eclampsia**

Evening primrose oil, containing the important omega-6 gamma linolenic acid, has been hailed as an effective treatment against the development of pregnancy-induced high blood pressure, known as pre-eclampsia. Pre-eclampsia generally develops in the second half of pregnancy occurring in approximately one in ten women and is caused by damage to the placenta (the special organ which supplies the baby with oxygen and food from the blood).

Problems in circulation are developed which can lead to high blood pressure and swelling throughout the hands, legs and ankles. In some cases pre-eclampsia can become more dangerous, resulting in blood clots that could eventually lead to stroke. Research is ongoing into trying to determine the cause of pre-eclampsia; however, prevention remains the key. Different drugs and supplements, such as evening primrose oil, fish oil, dietary protein, calcium supplements, magnesium oxide and aspirin, have been suggested as possible preventive measures.

In a study published in 1992 in *Women's Health*, a combination of evening primrose oil and fish oil was compared to magnesium oxide and to a placebo (fake pill) in preventing pre-eclampsia during pregnancy. All were given as nutritional supplements for six months to a group of pregnant women. Some of these women had personal or family histories of hypertension (21%). Compared to the control group (29%), the group receiving the mixture of evening primrose oil and fish oil containing GLA, EPA and DHA had a significantly lower incidence of swelling (13%). At the end of the study there were only three cases of eclampsia, all in the control group, showing the preventive effect of evening primrose oil and fish oil.

### **Fish for Brawny Brains**

A recent study published in the *American Journal of Clinical Nutrition* found that pregnant women who ate more fish gave their babies a better chance at mature brain development. The study also found that mothers with more DHA in their blood had babies with better sleep patterns in the first 48 hours following delivery compared to those whose mothers consumed less fish. It has been hypothesized that infant sleep patterns are thought to reflect the maturity of a child's nervous system, and have been associated with more rapid development in the first year of life. The omega-3 DHA, along with the omega-6 arachidonic acid, are the key building blocks for healthy brains and eye development.

## **Baby Blues**

A sufficient supply of omega-3s is not only crucial for the baby during the gestation stage, but also for the mother. During pregnancy and lactation, DHA levels are low because the body is giving the nutrients to the baby. After giving birth, the mother is often left depleted of omega-3 fatty acids and numerous health problems may result. For example, new, ongoing research finds women with low levels of DHA may be at an increased risk of developing a condition known as postpartum blues or postpartum depression.

Approximately 15–20% of women who give birth in the United States develop postpartum depression, according to the Director of the Mother and Child Foundation. Dr. Hibbeln of the National Institute on Alcohol Abuse and Alcoholism in Bethesda, Maryland has studied the effects of fish consumption and risk for postpartum depression. His conclusions were countries with higher fish consumption, such as Japan, Hong Kong, Sweden and Chile, had the lowest levels of postpartum depression, while countries with the lowest fish consumption, Brazil, South Africa, West Germany and Saudi Arabia, had the highest rates of postpartum depression.

However it is important for women to monitor the type of fish they are consuming due to the risk of mercury poisoning. The Food and Drug Administration and the Environmental Protection Agency in the US recommend that pregnant and nursing women consume only five ounces of fresh fish per week to reduce exposure to mercury. See the chart below to choose safer fish to eat. This is one of the reasons that choosing a high quality fish oil supplement instead of eating whole fish may be beneficial. Fish oil supplements are tested for heavy metals such as mercury, therefore reducing your exposure to these toxins. As well, the majority of mercury is stored in the muscle of fish instead of the fat, thereby reducing

the mercury content in fish oil supplements.

**ONE FISH, TWO FISH,  
BAD FISH, GOOD FISH**

Heavy metal content in longer living fish is a growing concern among health authorities. Pregnant women in particular must be careful to limit their intake to five ounces per week as dangerous elements such as mercury can pass to the fetus.

<u>Fish to Avoid</u>	<u>Safer Fish to Eat</u>
fresh tuna	grouper
king mackerel	halibut
shark	lobster
swordfish	orange roughy
snapper	salmon
	trout

### **Omega-3s are Baby Fuel**

Lactating women have an increased need for EFAs since breastfed babies require a constant supply of DHA, GLA, and AA. While omega-3 fatty acids are critical for the development of a healthy fetus, they are equally important as the infant grows and matures. Human breast milk is 50% fat, which is the fuel for the tremendous growth rate of newborn infants. While breast milk has been known as the “perfect food” for an infant and is a source of EFAs, the proportion of DHA and other omega-3s in breast milk varies from population to population. Numerous studies have found that the content of DHA in mother’s milk depends largely on the type and quantity of food consumed. Research has shown that the breast milk of women living in Canada and the United States is deficient in omega-3s in comparison to women in China and Japan. Certain dietary changes or supplementation with an omega-3 source may be necessary for breastfeeding women in North America to ensure their babies are receiving adequate quantities of DHA.

While the long-term consequences of inadequate levels of omega-3s are not completely understood, research supports the observations that infants who are lacking in omega-3s have lower visual acuity and are at greater risk for developing attention deficit disorders (ADD and ADHD) and depression later on in life. Breastfed infants perform better on cognitive function tests later in life than those fed standard formula.

Visual acuity maturation in full-term infants fed either human milk or cow milk formula containing 12–18% LA and 0.5–1.0% ALA were studied, the results indicate that visual acuity was more mature in the 4-month-old exclusively breastfed infants receiving DHA in comparison to infants of the same age receiving formula devoid of DHA.

### **Omega-3s for Life**

Omega-3s are essential for all age groups and stages of life. To ensure you are receiving sufficient essential fatty acids, consume a fatty type of fish such as salmon at least twice a week and snack on nuts and seeds to receive other valuable essential fatty acids. If you find that your diet isn't packing the omega punch that it needs, consider supplementing with high quality fish oil, flax oil, evening primrose or borage oil daily.

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