



Be informed. Be proactive.

PERINATAL NUTRITION

The Missing Fatty Acids

by Marilyn Sidwell with oversight by John W Jones, MD

Watch your children succeed

How you can be healthy during pregnancy and lactation and give your baby the best possible start in life.

1. If not already supplementing with Ultra Omega-Linic, you should add these Essential Fatty Acids (EFAs) to your diet as early as possible in the pregnancy, but at least during the last trimester. You should continue the daily dose of Ultra Omega-Linic while breast feeding your baby.
2. Ultra Omega-Linic can be used to supply adequate amounts of LCPUFAs to the baby. How? Poke a hole in the capsule and squirt the contents into the baby's mouth. Babies seem to actually enjoy the taste (try it, you'll like it).
3. Natural sources of LCPUFAs are superior to laboratory and/or genetically modified sources. Yes, you will be able to achieve higher and 'purer' levels of a single specific EFA, such as DHA, when it is 'created'. But, by using a synthetic ingredient you will miss out on the other nutrients which naturally occur in nature.

In 1997 Dr. Jones wrote about a new product he formulated which provided fatty acids that are essential for the development of an infant's brain and retina - especially an infant born prematurely. It was in a dropper bottle and was designed to be administered separately from infant formula or breast feeding.

Since 2002 a number of companies have made infant formula containing the LCPUFAs which have been determined to be the most important to the baby's early development. Besides Linoleic Acid and Alpha Linolenic acid they are adding DHA and ARA. In 2002 Dr. Jones saw this as a huge victory. At last, infant formula providers and consumers were paying attention to information about the necessity to provide infants with *PRE*formed, long chain, polyunsaturated essential fatty acids - LCPUFA.

Dr. Jones places emphasis on Ultra Omega-Linic because by eating our typical 'Western Diet' our population is **deficient** in *PRE*formed LCPUFAs.

Terms:			
AA or ARA	Arachidonic Acid	(E)FA	(Essential) Fatty Acids
ALA	Alpha Linolenic acid n3 parent	GLA	Gamma Linolenic Acid
DGLA	Dihomo Gamma Linolenic Acid	LA	Linoleic Acid n6 parent
EPA	Eicosapentaenoic Acid	LCPUFA	Essential PreFormed Long Chain PolyUnsaturated Fatty Acids

For many reasons it is important to provide mothers and infants with LCPUFAs

For uncountable nutritional reasons, Mother's milk is the best choice for a newborn.

Mothers' milk is considerably more complex than ANY infant formula on the market. It contains substances and active compounds, some of which have yet to be identified, which promote the growth and development of the baby. Ultimately, the fats in mothers milk affect the mental and physical development of your baby.

However, because the amount of EFAs in her diet can vary, so can the EFA content of her milk. Her supply may not be enough for both her needs and the needs of the baby. There is an additional problem associated with the mother eating fish. There is no easy way to determine if commercially available fish carries heavy metals or contains other toxic contaminants. In fact, pregnant women in Hawaii are discouraged from eating any of the local fish. And how do you know the toxicity level of the oil found in the usual fish oil capsules?

During pregnancy and lactation the baby will take all the EFAs it needs from its mother. If her supply is depleted then she is at risk for post partum depression and other problems.

For these reasons, Dr. Jones emphasizes that pregnant or breastfeeding mothers should be supplemented with Ultra Omega-Linic. Ultra Omega-Linic contains *PRE*formed GLA, EPA and DHA. The fish oil is analyzed for contaminants such as heavy metals and organic pollutants. The radiation levels are low, and the fish oil is guaranteed to exceed Federal Safety Standards.

No BURPS - because the fish protein has been removed. Therefore, the probability of an allergic reaction to the fish is very minimal for mother and baby.

In addition to LCPUFAs, mothers' milk contains short and medium chain fatty acids (MCFAs). Medium chain fatty acids like Lauric Acid are quickly absorbed directly into the blood stream. The metabolic end products of MCFAs are ketones. Ketones are as good a source of energy for the infant as glucose. This is very beneficial for the baby as it is using energy at a very accelerated rate.

Side note: we are often asked if it is safe for a pregnant or lactating mother to use Ultra Monolaurin. We assure her that Monolaurin, and its other medium chain monoglycerides, are normally found in mothers' milk (Monolaurin is the mono- ester of glycerol and Lauric acid).

Medium chain fatty acids possess antiviral, anti bacterial and other protective properties for the newborn and developing infants. It is interesting that medium chain fatty acids rapidly increase in concentration in mothers' milk, and especially during the first week after birth.

Current suppliers of infant formula are adding DHA and ARA. As stated above, mothers' milk contains many more FAs than just these. GLA is what is missing from commercial infant formula. GLA is a precursor of the hormone-like Prostaglandin 1 series (PGE1)

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Linoleic Acid, GLA and DGLA are the predominant FAs in mothers' milk. Only LA is added to infant formulas. The baby would normally convert it to GLA and DGLA. However, this conversion is **suppressed** by the high levels of AA *added to the infant formula*. Therefore, production of these prostaglandin precursors is halted, setting the stage for atopic and inflammatory complications for the baby.

While the PGE1 precursors GLA and DGLA are not important to developing brain structure or peripheral nerve structure, as are AA and DHA, they exert powerful effects on the brain, even though there may be a smaller percent of them in mothers' milk or the diet. PGE1 affects the brain's performance and function. The mood and behavior, as well as learning and memory are modulated by this prostaglandin. PGE1 is a potent anti-inflammatory agent.

GLA, which becomes DGLA in the metabolic pathway to PGE1, has been studied for its positive effects on problems such as ADHD. Persons with atopic dermatitis (also called infantile eczema) have responded well to GLA supplementation.

There is a positive effect to GLA supplementation in the case of allergies, such as asthma, hay fever and allergic dermatitis. Ultra Omega-Linic is unique in that it contains these 3 essential LCPUFAs - GLA, EPA and DHA.

An easy way to understand the need for LCPUFAs is to consider the end product. Prostaglandins are hormone-like, and are formed from fatty acids. The fatty acids LA and ALA are from plants. These parent oils must be converted to longer chains to become the active forms used by the body. Two of them are inflammatory (PG2 is *very* inflammatory, and PG3 is mildly inflammatory).

The same enzymes are used regardless of the pathway (PG1, PG2 or PG3). The body shows a preference for their use in the PG3 pathway. The effect of this is to reduce the inflammatory effect of the (essential) Arachidonic acid. Because both the PG2 and PG3 Prostaglandins are inflammatory, you can see the need for GLA to contribute the anti-inflammatory PGE1 Prostaglandins.

Errors of Fatty Acid (FA) metabolism

There is no assurance that the body will be able to convert the parent oil LA or ALA to sufficient quantities of the LCPUFAs.

The $\Delta 6$ desaturase enzyme is the initial step in FA metabolism. For the parent oil to become a prostaglandin it must be acted upon and changed by the $\Delta 6$ desaturase enzyme. In a healthy young individual the $\Delta 6$ desaturase enzyme works slowly. The conversion of ALA to the longer chains of EPA and DHA, at best, is only 2%.

The action of the $\Delta 6$ desaturase enzyme is *blocked* by high alcohol consumption, by saturated fats, by 'trans' or hydrogenated fats. Deficiencies of vitamins and minerals disable the enzyme process. Some chemicals and some viruses can block the action of $\Delta 6$.

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In addition, the enzyme does not work well in very young (perinatal & newborns), with advancing age (>40), persons with diabetes and those with allergies.

Years of observation and research have shown that bypassing the $\Delta 6$ desaturase enzyme by adding the PREformed LCPUFAs (specifically GLA, EPA and DHA), it is possible to prevent or treat conditions which result from a deficiency of these LCPUFAs. The current addition of AA and DHA to infant formula covers the baby's nutritional need for them, but does not provide GLA or any other fatty acids needed by the baby.

To recap: there are 4 Essential PREformed LCPUFAs:

- GLA and AA are Ω (omega) 6 FAs
- EPA and DHA are Ω (omega) 3 FAs

A review of recent studies might lead one to believe that the *only* EFAs considered to be important to the developing and newborn infant are AA and DHA. This is not factually correct. Mothers' milk contains a spectrum of fatty acids. Actually, mothers' milk contains a high percentage of Linoleic acid as well as the other important w6 EFAs, GLA and DGLA. There is more total GLA plus DGLA (by percent) than total AA. In fact, by percent, there is much more w6 FA in mothers' milk than w3 FA.

Note: A reference to the harmful effects of the overabundance of w6 fatty acids in the diet refers to the overabundance of Arachidonic Acid.

Dr. Jones has written many articles over the years about the necessity of providing the human body with all the nutrients that are essential to support this marvelous machine we live in - on a *daily* basis. All this information is available on his website, jjConsulting.net

This EFA Flow Chart may make it easier to understand the pathways.

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