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Nutritional Information on the Essential Fatty Acids

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Vitamin "F" is a term that was once used for the essential fatty acid. Although neither the term vitamin "F" nor the words "essential fatty acids" is very familiar, almost everyone is familiar with the expression "polyunsaturated."* Polyunsaturated fats contain special fatty acids called essential fatty acids, EFA's. The liver can convert saturated fats into polyunsaturated fats as needed, with the exception of three essential polyunsaturated fatty acids. These are linoleic, linolenic, and arachidonic acids. The benefits attributed to the polyunsaturates are actually the benefits bestowed by the EFA's, essential fatty acids.**Polyunsaturated (or unsaturated, and saturated are chemical terms which refer to the way hydrogen is carried in the fatty acid molecule; most fats contain a combination of both saturated and unsaturated fatty acids.*

These fatty acids are designated "essential" cause they are essential to proper body function and must be provided to the body from an outside source. If we could achieve a completely fat-free diet, we would not be able to live either very long or very well. This is not to say you should run out and eat a lot of fatty foods. A balance of the appropriate fatty acids is required in the diet to maintain health.

We know that the essential fatty acids have two functions in the body. They are imperative to the construction of all body membranes, including the brain cells, and they are the basis for the production of the prostaglandins, hormone-like substances produced in the cells. In both instances, we see that the EFA's are responsible for our health at a basic cellular level.

It is the EFA's that make it possible for protein and cholesterol to synthesize in the repair of old cell membrane and in the construction of new membrane. The fluidity and flexibility of the cells depends on the amount of EFA's present. This has a direct effect on immune response. The EFA's also give energy, to help maintain body temperature, insulate the nerves, cushion and protect the tissues and are vital to metabolism. They are important to adrenal hormone production, they promote skin and hair health, they make calcium available for tissue use and elevate the



calcium level of the bloodstream, and they aid in weight reduction by burning saturated fats. There are cases where the essential fatty acids were helpful with prostate disease, and, along with vitamin E and several of the B vitamins, they must be present for the production of the sex hormones. The far-ranging effects of the EFA's indicates their importance throughout the body.

Gall bladder problems, acne, prostatitis and muscle tremors are a few indications of a deficiency of essential fatty acids. Laboratory studies with animals show that depriving them of EFA's results in the development of very bad skin and loss of hair, no resistance to infections, abnormal collagen formation, infertility (this is an especially rapid development in male animals), development of painful, swollen joints, liver damage, lethargy and irritability.

The other function of the EFA's is the manufacture of prostaglandins. The prostaglandins is a family of hormone-like compounds that control every organ in the body. Although they are not secreted by the glands, they also act like regulators and messengers. They are called prostaglandins because they were originally discovered in high concentrations in the prostate gland. At this time we know that there are over 36 different prostaglandins. We know that much of the action attributed to the EFA's is due to their conversion to prostaglandins and to the subsequent prostaglandin action.

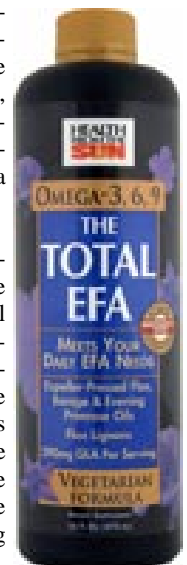
Prostaglandins are not stored in the system. Instead each cell keeps a minute amount of EFA so that it can produce prostaglandins when and where they are needed. The most important of the essential fatty acids is linoleic acid. Both

linolenic and arachidonic acids can be made in conversions from linoleic acid. (See figure 1). Some people are not able to make this conversion and must be supplied with linolenic and arachidonic acids. These acids form the basis for conversion into different types of prostaglandins.



Arachidonic acid, the final conversion, is important to reactions involving fat-protein metabolism at the level of the cell nucleus. Arachidonic acid does not exist in a vegetable form. It is converted from linolenic acid in the liver. Because the EFA's can be difficult to obtain in an absorbable form in the diet, and because some people have difficulty in making the conversions or may not be able to make them at all, there is now a supplementary formula. The arachidonic acid in the formula is extracted from liver.

Certain vitamins and minerals are necessary for the conversion of essential fatty acids into prostaglandins. This conversion cannot take place without specific enzymes acting as catalysts, and the enzymes are not effective without the nutrients. The following are supporting vitamins and minerals:





Vitamin E protects the essential fatty acids from being destroyed by oxygen. When the fatty acids in the bloodstream do not interact with oxygen, there is more oxygen to go to the muscles and to improve circulation. The result of this is greater physical endurance.

The antioxidant action of vitamin E also protects carotene (the vitamin A precursor), vitamin A, the B vitamins (indirectly), and the pituitary, adrenal, and sex hormones.

Selenium too performs as an antioxidant to all the oils. The presence of both vitamin E and selenium in the cell and the cell membrane bring further antioxidant protection. These two nutrients have a "sparing, effect" on each other.



In other words, both are needed in lesser quantities because of the presence of the other.

Lecithin also enhances the action of vitamin E. Besides being a source of choline and inositol, lecithin is a carrier of essential fatty acids. Lecithin serves as a structural material for every cell in the body, and is particularly important to the brain and nerves. It aids in the transportation of fats, helping the cells to remove fats and cholesterol from the blood. It can do this work because it is an emulsifying agent. When it is taken in supplement form, it is broken down in the liver and re-synthesized for use by the body.

Lecithin cannot be produced by the

body without adequate Be. B6 is involved in the metabolism of unsaturated fatty acids in the body. It is essential to the ultimate conversion of linoleic acid into arachidonic acid.

Vitamin A works with vitamin E and selenium to prevent oxidation. Its absorption is enhanced by lecithin. It is also necessary to liver function.

Liver Extract (fat and cholesterol free): Since much of the action of vitamin E and the essential fatty acids takes place through the liver. It is important to take liver extracts. This brings nutrient support to the organ itself.

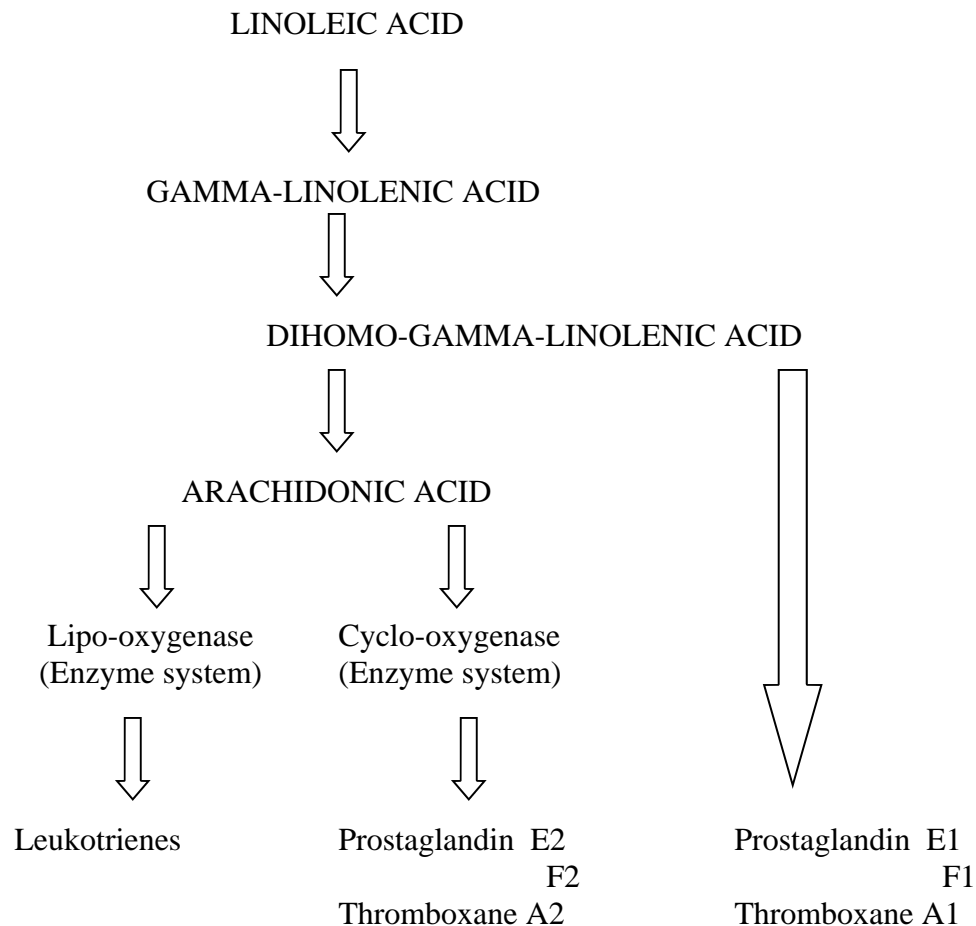
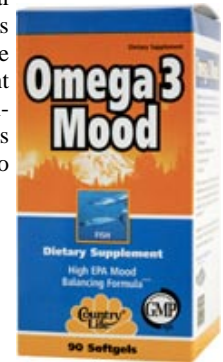


Figure 1 The biochemical conversion process (simplified).