

Essential Fats

FOR HEALTHY LIVING

Spring 2000

Where do Essential Fats Come From?

There are a number of natural sources of essential fats (or “Essential Fatty Acids”), including several plants and some species of fish. Oils are made from these sources for dietary supplementation. Plant sources of Essential Fatty Acids (EFAs) include Borage (also known as Starflower), Evening Primrose, Black Currant, Flax, Fish, and Hemp.

Borage (Starflower)

Borage, also known as Starflower, has long been grown in kitchen gardens, both for its uses as a herb and for the sake of its flowers, which yield excellent honey. According to Mrs. M. Grieve’s “Modern Herbal”, first published in 1931, cooks of the 19th century used young Borage leaves in salads, and “our great grandmothers preserved the flowers and candied them”. Today, the plant is grown as a commercial crop and harvested for the seed, which is nature’s richest source of the fatty acid GLA. Oil produced from Borage seed contains between 20 and 24% GLA. (GLA and other “active ingredients” are described on the next page.)



Evening Primrose

Evening Primrose is commonly found in dry, open places, in fields and along roadsides. Chiefly a night bloomer, Evening

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Essential Fats, or Essential Fatty Acids (EFAs) are **essential nutrients** that the human body can't produce itself. The only way humans can get these nutrients is through the diet.

EFAs are polyunsaturated fats, which are considered “**good**” fats. EFAs contribute to the healthy functioning of cell membranes, and are also critical for the synthesis of eicosanoids, a family of hormone-like substances that help in cell maintenance on a minute-to-minute basis.

Research with EFA supplementation has shown promise in a number of areas including: rheumatoid arthritis, skin conditions such as eczema and psoriasis, high blood cholesterol, coronary **heart disease**, diabetic neuropathy, high blood pressure, high blood triglycerides, and cancer.

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Primrose is a plant that opens so fast you can literally watch it bloom before your eyes. It has showy single flowers in pink, white or yellow and can reach 6 feet with blooms at the top. The pointed buds open at dusk, hence the name Evening Primrose. American Indians used Evening Primrose roots in tea for obesity and bowel pains, and in a pulp for piles, bruises and on muscles to give strength. Today Evening Primrose crops are grown commercially in many parts of the world. Manufacturers harvest the Evening Primrose seed for its oil, a natural source of GLA. Oil from the Evening Primrose seed contains 8-10% GLA.

Black Currant

The small, round, juicy berries of this plant are familiar ingredients in herbal teas and jams. However, the tiny seeds inside the berries, are a rich source of essential fats. Oil produced from black currant seed contains 15-17% GLA and 10-12% ALA.

Flax

Flax seed has been used by various civilizations around the world for more than 10,000 years. In modern



times, we are rediscovering its nutritional benefits. The oil of the seed is a rich source of Essential Fatty Acids, containing 50-60% ALA. Flax seed also contains other nutritional components including fiber and lignans. Flax seed oil is prepared commercially in liquid form or in soft gel capsules. The seed is also available whole or milled for use in breads, or for sprinkling on salads and cereals.

Fish

Many of us remember swallowing spoonfuls of cod-liver oil in the distant days of childhood. Well, our mothers were right – Fish Oil, containing the fatty acids EPA and DHA, is a valuable supplement to a healthy diet. Today, Fish Oil is prepared mainly from salmon, cod liver, and tuna. With the modern invention of encapsulation, we no longer have to swallow Fish Oil by the spoonful – manufacturers offer Fish Oil in a variety of capsule sizes and as part of many combination formulas.

Hemp

Hemp has become the textile of the 90s. But did you know that the oil of the Hemp seed has many therapeutic benefits as well? Hemp Seed Oil contains small amounts of fatty acids – both GLA and ALA. Hemp is used in many cosmetics, especially skin care products, and is also useful as a dietary supplement.

Essential Fatty Acid Oils

The “Active Ingredients”

Alpha Linolenic Acid (ALA)

ALA is found primarily in Flax Oil and is also found in Black Currant Oil. The positive effects of ALA have been documented in areas including: high blood cholesterol, high blood pressure, immune system function, and cancer.

Gamma Linolenic Acid (GLA)

The richest natural source of GLA is Borage (also known as Starflower) Oil. GLA is also found in Black Currant and Evening Primrose Oils. GLA is popularly used by women suffering from PMS. However, GLA has been clinically indicated to have therapeutic benefits in many other health conditions including: rheumatoid arthritis, cardiovascular disease, diabetic neuropathy, cancer, and skin diseases such as eczema and psoriasis.

Eicosapentaenoic Acid and Docosahexaenoic Acid (EPA and DHA)

These two difficult-to-pronounce fatty acids are responsible for the beneficial effects of Fish Oils. Research demonstrates that Fish Oils containing EPA and DHA have therapeutic benefits in areas including: high blood triglycerides, high blood pressure, cardiac arrhythmia (irregular heart beat), infant brain development, and cancer.

Each Essential Fatty Acid plays a specific role in the body. Just like other essential vitamins and minerals, all are necessary for good health.

“Eicosa-whats?”

A glossary of other terms you'll encounter in the world of EFAs

Eicosanoids

A family of powerful, hormone-like compounds produced in the body from Essential Fatty Acids. These compounds include prostaglandins, leukotrienes, and thromboxanes, which are responsible for many of the beneficial effects of Essential Fatty Acid oils.

Anti-oxidants

Anti-oxidants act as stabilizers by preventing oxidation or “break-down” of polyunsaturated fatty acids such as Essential Fatty Acids in oils and in the body. Anti-oxidants are essential for health and include vitamins such as vitamin E, mixed tocopherols, vitamin C and beta carotene.

Nutraceuticals

This word is derived from two familiar terms: nutrition and pharmaceuticals. The result is a word that refers to dietary supplements and/or nutritional ingredients that promote optimal health. The word has come into common use in the last 10 years, as the interest in nutritional supplements has surged.



Organic

Plants grown and/or processed without the aid of non-naturally occurring chemicals including fertilizers, pesticides, and herbicides.

Soft Gel Capsule

Gel capsules are a modern invention that allow oil to be “encapsulated” in a soft shell that is easy to swallow and digest. The capsule also protects the oil from oxygen – encapsulated oils can maintain their quality for several years if stored properly. All Essential Fatty Acid oils are available in capsule form, making them easy to consume on a daily basis.

Dietary Fat

Dietary fat, also known as dietary lipid, includes Triglycerides, Phospholipids, Free Fatty Acids, and Sterols (cholesterol and phytosterols).

There are “good” and “bad” fats. Dietary fat – especially saturated fat and trans fatty acids – has developed a bad reputation in recent years as a factor contributing to cardiovascular disease. However, a certain amount of dietary fat and Essential Fatty Acids are critical for optimal growth and functioning:





- Dietary fat is the primary constituent of all our cell membranes.

- Dietary fat is necessary for the synthesis of a number of important hormones including sex hormones (estrogen, androgen, progesterone), and adrenocortical hormones.
- Dietary fat is necessary for the absorption of vitamins A, D, E, and K.
- Dietary fat is the chief storage form of energy in the body. Fats can be efficiently stored within the body, and provide more than two times the amount of energy (in the form of calories) than carbohydrates.
- Dietary fat plays an important role in the maintenance of body temperature. The layer of fat found under the skin acts to insulate the body from extremes in temperature, acting as an internal climate control. In addition, fat surrounds, cushions, and protects the body's vital organs from physical shock.



The Chemistry of EFAs

Legend

-  Carbon atom with single bonds
-  Carbon atom with double bonds
-  Hydrogen atom
-  Oxygen atom

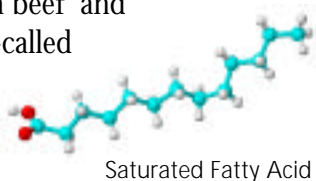
Fatty Acids

Fatty acids are the basic building blocks for all lipids. Fatty acids are the nutritional components found in dietary fats and oils, and are chemical “chains” consisting of carbon and

hydrogen and ending with an acid group. Fatty acids vary in length and degree of saturation, and are generally up to 26 carbons long. The specific chemistry of the fatty acid, including the number of carbons and double bonds, will affect how it functions in the body, including its health benefits.

Saturated Fats

Saturated fatty acids result when all carbons in the chemical chain are “saturated” with hydrogen. This means that the fat molecule does not contain any double bonds. Saturated fats are dense, solid fats that do not melt at room temperature – for example the white fat in beef and lamb. These are the so-called “bad” fats that are known to contribute to cardiovascular disease when consumed in excess.



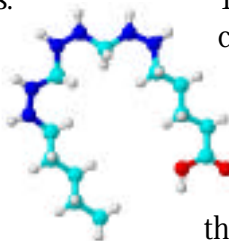
Unsaturated Fats

Unsaturated fatty acids result when not all carbons in the chemical chain are saturated with hydrogen. This means that the fat molecule contains one or more double bond. The double bonds create “kinks” in the molecule, producing a fat that is fluid at room temperature. Unsaturated fats are known as “good” fats because they help cellular function

and promote heart health.

There are two types of unsaturated fatty acids:

1. *Monounsaturates* – fatty acids that contain one double bond. These fats are fluid at room temperature. For example, oleic acid, which is found in olive and sesame oils.



Polyunsaturated Fatty Acid

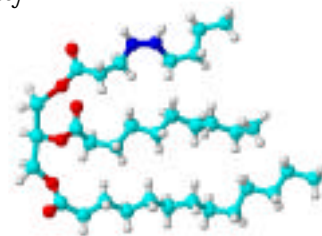
2. *Polyunsaturates* – fatty acids that contain more than one double bond. These are the most fluid fats of all and include fats such as corn, soybean, and sunflower oils. Essential

Fatty Acid oils also fall into this category.

Triglycerides

Both Saturated and Unsaturated fats are usually consumed in the form of Triglycerides, which consist of three fatty acids bound to a glycerol backbone. The attached fatty acids can be either the same or different. The presence of saturated fatty acids will result in a saturated fat; similarly, the presence of one or more unsaturated fatty acids will result in an unsaturated fat.

In the human diet, Triglycerides are by far the most abundant form of dietary lipids, constituting approximately 95% of total fat consumed. The remaining 5% is in the form of phospholipids, free fatty acids (fatty acids not bound to a glycerol backbone), cholesterol, and plant sterols. In addition, triglycerides are the predominant storage form of fat in the body.



Triglyceride

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