

## EFA

**Essential fatty acids (EFAs)** - are fatty acids that, although necessary for the body's normal growth and function, cannot be made by the human body and therefore must be obtained in the diet. EFAs are integrated in most cell systems of the body and influence the cardiovascular system, the immune system, the joints and the brain.

There are two families of essential fatty acids:

**Omega-6** including **linoleic acid**

**Omega-3** including **alpha-linolenic acid**

**Omega-6** - is a polyunsaturated essential fatty acid including **linoleic acid (LA)** and its derivatives **GLA**, and **DGLA**. Omega-6 is found abundantly in the average diet (vegetable oils, margarine and processed foods).

**Gamma-linolenic acid (GLA)** can be formed from linoleic acid by the action of the delta-6-desaturase enzyme. This enzyme reaction is often considered the "rate limiting", or slowest step of the metabolic pathway. The D6D enzyme functions at different rates in individuals based on environmental and lifestyle factors. Ideally, the body converts some **LA** to **GLA**, but many people cannot adequately convert **LA**. **GLA** is not common in the diet, but is found in evening primrose oil.

**Dihomogamma-linolenic acid (DGLA)** is an **omega-6** fatty acid formed from **GLA** and is the precursor to the series 1 eicosanoids. Eicosanoids are a family of powerful, hormone-like compounds. Series 1 and 2 are formed from the **omega-6** fatty acids and series 3 are formed from the **omega-3** fatty acids. Eicosanoids include prostaglandins, leukotrienes and thromboxanes which are responsible for many of the beneficial effects of **EFAs**. Eicosanoids control numerous



### Supplement Facts

Serving Size: 1 Capsule

Servings Per Container: 90

Amount Per Capsule	% DV
Total Calories	6.48
Calories from Fat	6.48
Total Fat	0.72 g 1.11%*
<b>Omega-3 Fatty Acids</b>	<b>355 mg</b>
EPA (Eicosapentaenoic Acid) (Fish Oil 33/22 TG)	135 mg †
DHA (Docosahexaenoic Acid) (Fish Oil 33/22 TG)	90 mg †
ALA (Alpha Linolenic Acid) (Organic Flax Seed Oil 50% ALA)	70 mg †
Other Omega 3 Fatty Acids	60 mg †
<b>Omega-6 Fatty Acids</b>	<b>67 mg</b> †
GLA (Gamma Linolenic Acid) (Evening Primrose Oil)	5 mg †
LA (Linoleic Acid) (Evening Primrose Oil, Flax Seed Oil)	62 mg †
<b>Omega-9 Fatty Acids</b>	<b>30 mg</b> †
OA (Oleic Acid) (Fish Oil, Flax Seed Oil, Evening Primrose Oil)	30 mg †

\*% Daily Values are based on 2,000 calorie diet.

†Daily Value not established

**Other Ingredients:** Gelatin, Mixed Tocopherols





body processes such as inflammation, blood clotting, blood pressure, and immune response.

**Omega-3** - is a polyunsaturated fatty acid including **ALA** and its derivatives **EPA** and **DHA**. It is estimated that 95-99% of the population gets too little **omega-3** in their diet. **Alpha-linolenic acid (ALA)** is the parent **omega-3** polyunsaturated essential fatty acid. It is the precursor to **eicosapentaenoic acid (EPA)**, **docosahexaenoic acid (DHA)** and some eicosanoids including prostaglandins of series 3 and leukotrienes of series 5.

**EPA** and **DHA** are very long-chain fatty acids formed from **alpha-linolenic acid** through a series of steps also requiring the  $\Delta 6$  enzyme reaction and, therefore, subject to the same metabolic conversion limitations.

Fatty acids such as **GLA**, **EPA** and **DHA** that are manufactured in the body from the essential fatty acids **LA** and **ALA** are considered **conditionally essential fatty acids**, and due to limitations in the metabolism, need to be directly supplemented.

**Fish Oil** concentrates are distilled and refined during several processes in order to reduce saturates and contaminants that can remain in unrefined grades. Concentrating the **EPA/DHA** content of fish oils effectively multiplies the health benefits of omega-3 fatty acids. The fish oil in **Whole-istic Solutions EFA** has a minimum of 60% omega-3 fatty acids, increasing the availability of EPA and DHA in the body. This is double the amount found in many fish oil supplements which contain only 30% omega-3.

#### Excellent Safety Profile

Concentrates, by their very nature, are highly purified, offering fewer contamination worries. The oil used for **Whole-istic Solutions EFA** is from anchovies and sardines from the clean waters of

the Pacific Ocean. Fish which are higher up the food chain, such as sea bass, shark, swordfish and king mackerel, are at greater risk for accumulating high levels of pollutants. Pollutants such as dioxins, pesticides and PCBs are minimized to well below legislative and industry limits using advanced chromatographic and purification techniques.

Proprietary concentration and purification technologies protect the lipid to yield omega-3 concentrates with excellent oxidative profiles. The oils are processed gently under an inert atmosphere, reducing exposure to high temperatures and eliminating exposure to oxygen, thus minimizing degradation. A unique refining process further purifies the oils to remove polar contaminants and refine taste, odor and color. They are further protected from oxidation using identity-preserved, non-genetically modified **mixed tocopherol** antioxidants.

Throughout production, the oil is rigorously controlled by quality standards, resulting in a pharmaceutical-grade product.

#### Greater health benefits

Much of the clinical research into the effect of omega-3s on specific health conditions has been carried out using concentrated fish oils.

**EPA** is needed to make the health-protecting series-3 eicosanoid hormones, which balance cell metabolism and reduce inflammation and platelet aggregation. As a result, **EPA** has been shown to benefit conditions such as heart disease and arthritis.

**DHA** concentrates are linked to healthier brain function, nervous system development, mood regulation and improved behavior. **DHA** is one of the building blocks for brain growth and





development. Numerous animal studies show that **DHA** improves learning, memory, concentration and vision processes.

Recent studies have linked low **DHA** levels with cognitive decline in the elderly. A Rotterdam study found that elderly men who consumed more **DHA** were better able to sustain their mental abilities including memory, concentration and their ability to communicate verbally.

**DHA** is the primary structural fatty acid in the retina and is critical for eye development and health. Increased consumption of omega-3 fatty acids is associated with a reduction in the risk and symptoms of age-related macular degeneration, the most common cause of visual impairment and blindness in people over the age of 50.

**Flaxseed Oil** is produced from certified organic seeds, expeller-pressed without hexane or other harsh chemicals. **Flaxseed oil** is a remarkably good source of the essential fatty acid **alpha-linolenic acid (ALA)**.

In healthy conditions, as much as 20% of the **ALA** we consume is transformed in our bodies into **EPA** and **DHA** (the same beneficial compounds found in fish oil). Again, the benefits of **EPA** and **DHA** include: protection from fatal heart attack, decreased inflammation and pain in arthritis, and protection from thrombotic disease.

In the past, most research on **ALA** has related to its role in producing **EPA** and **DHA**. Recent research also indicates that **ALA** has other beneficial functions in the human body beyond its conversion to **EPA** and **DHA**. **ALA** is useful for protection from heart diseases and cancer, improving immune function and treating male infertility.

**Evening Primrose Oil** is rich in essential fatty acids and contains 74% **linoleic acid (LA)** and 8-10% **gamma-linolenic acid (GLA)**. Although other oils such as borage oil and black currant oil contain higher amounts of **GLA**, evening primrose oil is by far the best source. Evening primrose is naturally free of toxins, and its oil does not need to be refined. Research has shown that it works better than borage oil because other nutrients naturally present in the unrefined evening primrose oil aid in the metabolism of **GLA**.

Evening primrose oil also contains 11% **oleic acid**, 6% **palmitic acid**, and 2% **stearic acid**.

Under ideal conditions, the body uses **LA** to produce **GLA**. In turn, **GLA** is used to produce beneficial hormone-like compounds called prostaglandins, specifically, series one prostaglandins such as prostaglandin E1. Prostaglandins affect the function of virtually every system in the body. They are used in the regulation of inflammation, pain, blood pressure, fluid balance, and blood clotting. Prostaglandins also affect hormone production and function.

The key to understanding the importance of supplementing oils rich in **GLA**, is in a widespread inability to convert **LA** to **GLA** efficiently. Dietary deficiencies, disease conditions, aging, viral infections and consumption of processed or heated oils, trans fatty acids, alcohol and sugar interfere with the enzyme that catalyzes the conversion of **LA** to **GLA**. The result is that virtually all North Americans are deficient in **GLA**. Supplementing with evening primrose oil can help restore the production of beneficial prostaglandins derived from **GLA**. Research completed over the last 20 years has confirmed that supplementation with evening primrose oil has beneficial effects in





numerous diseases and conditions including: premenstrual syndrome, fibrocystic breast pain, eczema, rheumatoid arthritis, diabetes, heart disease, osteoporosis and ulcerative colitis. Other conditions for which it may provide benefit include menopause and pregnancy.

### Encapsulation

Ensuring that the stability of the oils is maintained is just as important as choosing the proper oils. Throughout the manufacturing process, medical grade Nitrogen is utilized to displace oxygen that would otherwise come into contact with the raw materials. In the presence of oxygen, the delicate oils would degenerate and lose potency as a result of oxidation (the reaction whereby a substance is broken down by losing electrons to oxygen molecules).

To ensure that oxygen exposure is eliminated, nitrogen is used in the following processes:

- Nitrogen is placed on the oils after the containers are opened to sample for raw material testing.

- Nitrogen is placed in the mixing tanks during preparation of the oils to keep them under a nitrogen blanket the entire time they are in the vessel.
- Nitrogen is injected into the cap at the last station before closing on the capsule filling machine, displacing the air at capsule closure.

**EFA** is encapsulated in a patented sealed Licap®. This unique capsule design maximizes seal integrity, greatly reducing oxygen permeability. Licap capsules are sealed using an innovative technology on a machine known as LEMS - Liquid Encapsulation Microspray Sealing. In the LEMS sealing process, sealing fluid is sprayed onto the joint between the cap and body of the Licap capsule. This lowers the melting point of gelatin in the wetted area. Gentle heat is then applied to fuse the cap to the body of the Licap capsule.

The result of this encapsulation process is a **stabilized EFA product** that has an extended shelf life and does not have to be refrigerated.



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