

# SCIENCE BRIEF:

## HEALTH BENEFITS OF ESSENTIAL FATTY ACIDS AND ENHANCED ABSORPTION/TOLERANCE WITH LIPASE

*Consider the following review of clinical research on the health benefits of essential fatty acids and observations regarding the use of supplemental enzymes to promote better utilization and tolerance.*

Transformation Enzyme Corporation is a nutritional supplement company specializing in the development of enzyme based nutritional supplements for the health care professional. Through clinical and observational research, Transformation's efforts focus on teaching the importance of healthy digestion (the absorption and delivery of nutrients to the cell) as the foundation of wellness and healthy living.

A poor diet, inadequate nutrient intake and a digestive system that fails to process food for nutrient bio-availability and absorption will undermine the body's coping ability and create conditions favorable for disease and metabolic disorders. Based on this fact, Transformation® strives to educate health care professionals worldwide on the benefits of a balanced diet, quality supplementation and proper digestion of both. The primary benefits are:

1. maintaining a strong digestive system
2. enhancing the bioavailability and delivery of nutrients to the cells
3. supporting a strong immune system and regulation of inflammation
4. promoting efficient and timely removal of metabolic byproducts and environmental toxins

***Healthy digestion – the absorption and delivery of nutrients to the cell – is the foundation of wellness and healthy living***

This science brief will review the role of essential fatty acids (EFA's) as important factors underlying preventive health and wellness as well as their efficacy in reducing inflammation and improving cardiovascular health. Additionally, this science

brief will highlight Transformation's supplemental lipase delivery system designed to maximize bio-availability and reduce digestive intolerances often experienced with oil-based supplements.

### EFA's and the Incidence of Chronic Degenerative Inflammatory Diseases

During the past two decades hundreds of studies and clinical investigations have clearly demonstrated the importance of including omega 3 and 6 fatty acids in the diet. Just as many studies have shown the decline in EFA intake and the rise in chronic degenerative diseases (Table 1). This is not to say

Table 1: Incidence of Chronic Degenerative Diseases in America

	Incidence	Cost
CVD - High blood pressure - Arteriosclerosis - Stroke	> 71 million (2003)	\$550 billion spent on surgeries
Risk factors - high chol - high CRP - arterial calcification	99.9 million at risk	\$300 billion spent on treatment, lost productivity, disability
Auto-Immune Disorders - R. Arthritis - Fibromyalgia - Lupus - Celiac Disease - Chronic inflammation	> 50 million	\$100 billion in direct health care costs
Neurological Disorders - Depression - ADD	15 million 4 million	\$3 billion
Diabetes II / Insulin Resistance	20 million (2005)	\$132 billion / year

EFA's are the total answer, but they are most definitely an important component of our health. "Today we know that omega 3 fatty acids are essential for normal growth and development and play an important role in the prevention and treatment of coronary artery disease, hypertension, diabetes, arthritis, other inflammatory and autoimmune disorders and even cancer" (AJCN 1999).

Among the polyunsaturated fatty acids (PUFA), there are only two "essential" fatty acids, alpha linolenic acid (ALA - an omega 3) and linoleic acid (LA - an omega 6). This means these two EFA's must be obtained in the diet as they cannot be synthesized in the body. From these two parent

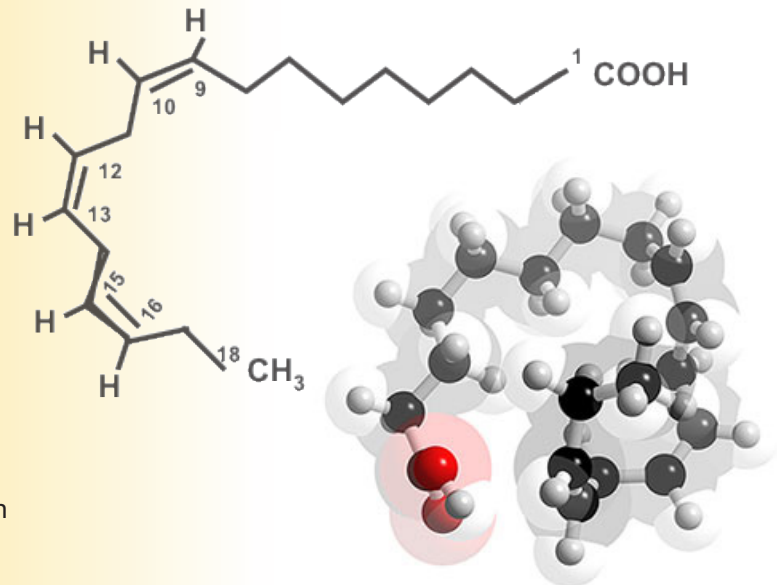
fatty acids all other important fatty acids can be made. The terms omega 3 and omega 6 refer to the chemical structure and position of the first double bond occurring from the terminal methyl group on the molecule.

From the essential fatty acids, ALA and LA, the body synthesizes additional fatty acids such as Arachadonic Acid (AA – omega 6), Gamma Lenoleic Acid (GLA – omega 6), Eicosapentaenoic Acid (EPA – omega 3), and Docosahexaenoic Acid (DHA – omega 3). These omega 3 and 6 fatty acids are the parent fatty acids for the production of eicosanoids, e.g. prostaglandins, thromboxanes, and leukotrienes. Eicosanoids derived from omega 6 fatty

Table 2: Polyunsaturated Fatty Acids

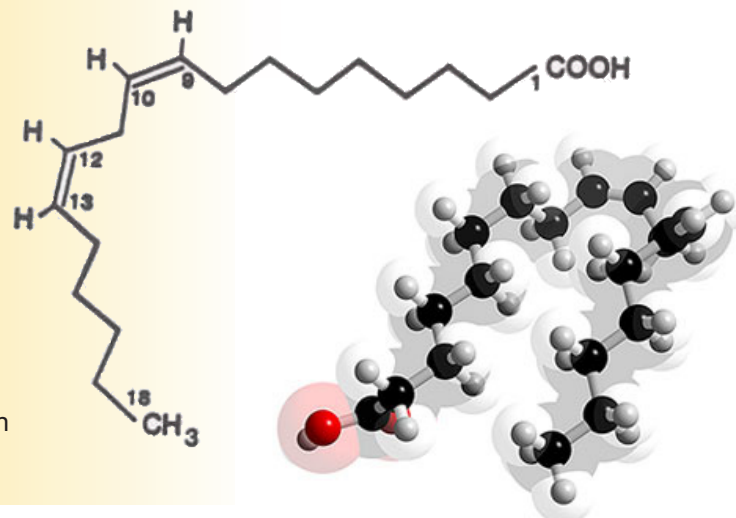
### Omega 3

- Alpha Linolenic Acid (ALA)
- Fish Oil
- EPA – Eicosapentaenoic Acid
- DHA – Docosahexapentaenoic Acid
- ↓ prostaglandin E (PGE)
- ↓ Thromoxane A2
- ↓ formation of Leukotyene B4
- ↑ Thromboxane A3
- ↑ Prostaglandin 13 (PG13)
- ↑ Leukotyene B?
- Anti-inflammatory
- Reduce platelet aggregation and vasoconstriction
- Reduces inflammation
- Weak platelet aggregation and vasoconstriction
- Vasodialator and inhibits platelet aggregation
- Weak pro-inflammatory



### Omega 6

- Linoleic Acid (LA)
- GLA – Gamma Linoleic Acid
- AA – Arachadonic Acid
- ↑ Prostaglandin E
- ↑ Thromboxane A2
- ↑ Leukotryene B4
- Pro-inflammatory
- Induces platelet aggregation and vasoconstriction
- Induces inflammation and leukocyte chemotaxis



acids have opposing metabolic properties to those derived from omega 3 fatty acids. Incorporating into the diet a healthy ratio of 4 omega 6 to 1 omega 3 or less is crucial for optimal health.

Referring to Table 2 it is apparent that omega 3 fatty acids are anti-inflammatory agents and omega 6 fatty acids are pro-inflammatory agents. Over the years the typical Western diet has gotten progressively out of balance, becoming much higher in omega 6 and virtually deficient in omega 3. Many scientists and researchers believe there is a direct correlation in the increased intake of vegetable oils (predominantly omega 6) and the significant rise in cardiovascular and inflammatory diseases.

The solution is to consume and absorb more fish and oils containing omega 3's (EPA and DHA) to replace or offset the omega 6 fatty acids and specifically Arachidonic Acid (AA) levels. The result is improved vascular health and blood viscosity, reduced allergies and better control of unnecessary inflammation.

Areas of interest in which EFA's / omega 3's are being studied and demonstrating health benefits are:

- Chronic inflammatory diseases – R. Arthritis, Cancer, Diabetes
- Heart Health – High B/P, Irregular Heartbeat, High Cholesterol and unfavorable ratios
- Mental health (neurotransmitters) – Depression
- Learning ability (brain function) – ADD
- Pregnancy – developmental disorders

## High Quality Essential Fatty Acids

Transformation's Professional Protocol™ **EFA 1200MG** formula is a highly purified fish oil concentrate with an EPA/DHA ratio of 1.5:1. This EFA blend focuses on omega 3 (EPA/DHA) to balance out the typical diet often higher in vegetable oils and thus higher in omega 6. The fish oil is derived from anchovies, sardines, and mackerel caught wild off the coast of South America and processed in Canada and has been molecularly distilled to remove any heavy metals or other contaminants, verified < 0.1 ppm for lead, mercury, and cadmium.

**Recommended Usage:** Take one (1) softgel with meals or as directed by a health care practitioner. Take with adequate liquid.

## Benefits of Enzyme-Delivered EFAs

The digestion of fats can sometimes be more difficult. It requires bile from the liver and gallbladder, lipase enzymes, and a much longer time period. Also, many people no longer have their gall bladder, adding to the digestive challenge. Therefore, we find essential fatty acids are best tolerated with food and with a digestive formula high in lipase (i.e., **DIGEST** and/or **LYPOZYME**).

Supplemental lipases have been observed to help support maximum digestion of dietary fats, and Transformation's lipase blends encourage maximum absorption and digestion of essential fatty acids. The enzymes in these formulas have been carefully researched and selected to provide you with highly effective, stable, and functional digestive enzyme supplements.

These digestive enzyme formulas are designed with high lipase specifically to support digestion of fats but also include proteases and carbohydrases for overall digestive support.\* Taking **EFA 1200MG** together with **DIGEST** and/or **LYPOZYME** will therefore also help ensure maximum bio-availability and absorption of the essential fatty acids. The benefits to the consumer is improved nutrient bioavailability, absorption, and tolerance – no more burping fish oil!

### Transformation's Professional Protocol™ EFA 1200MG

#### Supplement Facts

Serving Size 1 Softgel

Servings Per Container 60

	Amount Per Serving	% Daily Value
Calories	13	
Calories from Fat	11	
Total Fat	1 g	1%**
Marine Lipid Concentrate	1.2 g	†
Eicosapentaenoic Acid (EPA)	360 mg	†
Docosahexaenoic Acid (DHA)	240 mg	†

\*\* Percent Daily Values are based on a 2,000 calorie diet

† Daily Value not established

OTHER INGREDIENTS: SOFTGEL CAPSULE (GELATIN, GLYCERIN, PURIFIED WATER), MIXED TOCOPHEROLS (TO MAINTAIN FRESHNESS)

## Enzyme Safety and Stability

Both **DIGEST** and **LYPOZYME** contains proteolytic, lipolytic, and polysaccharolytic enzymes from microbial fungal sources, making them safe, effective, and GI tract stable and functional. This means the enzymes in these products do not require an enteric coating to survive the harsh environment of the stomach but rather initiate digestion in the stomach and continue the digestive process in the small intestines. This is important when you consider that as much as 80% of the body's energy is required during the digestive process. **DIGEST** and **LYPOZYME** will work with the body, making it more efficient in liberating nutrients while lessening the overall burden.

**DIGEST** and **LYPOZYME** feature acid-resistant lipase produced from the controlled fermentation of *Rhizopus oryzae*. The lipolytic enzymes in these formulas catalyze the hydrolysis of tryglycerides, yielding mono- and diglycerides, glycerol, and free fatty acids. Lipase is an effective digestive aid because of its broad substrate specificity on fats and oils from vegetable and animal origin. Additionally, the lipase in **DIGEST** and **LYPOZYME** demonstrates an effective 3.0-8.0 pH range with peak activity at 4.0, making this product highly stable and functional in the gastrointestinal tract.

The lipase in these formulas is measured in FCC (Food Chemical Codex) activity FIP lipase units. **LYPOZYME** is formulated with 6,250 FIP of lipase and **DIGEST** includes 7,518 FIP of lipase to support maximum digestion of dietary fats and reduce digestive stress.\* These products can help reduce the discomfort associated with occasional gas, bloating, cramping, diarrhea, and constipation.\* **DIGEST** and/or **LYPOZYME** may also help reduce the signs and symptoms associated with food intolerances.\*

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## Clinical Application

Given the fact that diabetes (type II), obesity, pain management, and cardiovascular disease are among the top 10 most prevalent health challenges facing Americans today, a closer look at prevention deserves attention. Research shows the addition of essential fatty acids, specifically omega 3's, can help reduce chronic inflammation and the degenerative diseases associated with inflammation.

Taking **EFA 1200MG** together with the lipase delivery system in **DIGEST** and/or **LYPOZYME** further enhances the benefits of taking an essential fatty acid supplement in addition to improving tolerance and decreasing the problems of indigestion, gall bladder stress, and burping that often occur when taking fish oil supplements.\* At the same time, the added benefit of taking digestive enzymes is support of nutrition and overall health.\*



**TRANSFORMATION**  
THE GENESIS OF GOOD HEALTH®

\*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.