# Essential Fatty Acid Supplementation:

## Why The Combination Of Flaxseed, Borage Seed And Fish Oil Is The Optimal Blend For Your Heart, Brain, Joints, Immune System, Skin And Cancer Prevention

- by Dr. James Meschino, DC, MS, ROHP

## Table Of Content

# Introduction

Recent research studies confirms data findings of previous investigations, indicating that the synergistic action of essential fatty acids, richly supplied by flaxseed oil, borage seeed oil and fish oil, encourage the production of eicosanoids (mini-local hormones) that help defend the body against heart attack, stroke (and other cardiovascular diseases), control blood pressure, reduce joint inflammation, support brain function and reduce incidence of age-related dementia, improve immune function, enhance the softness and smoothness of the skin and reduce risk of cancer development. Essentially, the polyunsaturated fatty acids, richly supplied by these oils, provides the body with the building blocks from which our cells make specific prostaglandins, prostacyclins, thromboxanes and leukotrienes (collectively known as eicosanoids), which act like local hormones that strongly influence tissue behaviour and cellular function.

Whereas the polyunsaturated fatty acids supplied by foods high in animal fat as well as certain types of vegetable oils high in linoleic acid, promote the formation of disease-promoting, inflammation-inducing eicosanoids, a lower animal fat diet, in conjunction with high monounsaturated fatty oils (e.g. olive oil) accompanied by daily supplementation with flaxseed, borage seed and fish oil (totalling 2400-3600 mg per day consisting of equal quantities of each oil) promotes the formation of eicosanoids that reduce risk of many diseases, improve the skin texture and help preserve cognitive function as we age.

Deficiencies and imbalances of essential fatty acids are common problems due to modern day agricultural, livestock, and food processing practices, which have significantly reduced the amount of omega-3 fats in our food supply. Other dietary behaviors have also limited our ability to produce and/or ingest optimal amounts of GLA (gamma-linolenic acid), and omega-9 fats, which provide a multitude of health benefits. In the body, essential fatty acids are important components of the outer skin (cell membrane) of every cell, which determines which chemicals and nutrients will be allowed to enter and exit the cell. Thus, essential fats influence the structure, function, and health status of every cell in the body. As vital components of nerve cell membranes, essential fatty acids facilitate nerve conduction, which enables the brain to think, and the transmission of impulses to other nerves, muscles, and organs. Essential fats are required for brain development, vision and as components of the cell membrane are used to form prostaglandin hormones, which produce powerful effects on a wide range of tissues, as outlined below. 1

## The Importance of Prostaglandin Hormones

Prostaglandins are local tissue hormones that are produced from the different types of unsaturated fats we consume from our diet, and from supplements containing essential oils. There are three main types of prostaglandin hormones (PG); PG-1, PG-2, and PG-3. Essentially PG-1 and PG-3 produce positive effects on our health while PG-2 produces very undesirable effects. Unfortunately, the dietary habits of most North Americans and the sub-optimal intake of important essential fats, tends to favor the production of PG-2, which encourages blood vessels to constrict and blood platelets to clot abnormally, restricting blood flow and increasing risk of heart attack, ischemic stroke, and high blood pressure. PG-2 also encourages inflammation, worsening arthritis, other joint, muscle and tendon conditions, as well as other inflammatory conditions (e.g. Crohn's disease, Colitis). Animal studies reveal that PG-2 may be associated with increased cancer risk in that it encourages more rapid cell division (when cells divide at a faster rate they tend to make more genetic mistakes and have less time to correct these genetic errors, enabling a cancerous mutation to occur). PG-2 formed within skin cells has also been shown to make the skin dry, rough, and scaly, and can aggravate a number of common skin disorders. 1,2,3,4,5

So how do you avoid forming too much PG-2? Simple, avoid the foods that contain the type of fats that produce PG-2, such as high fat meat products, high fat dairy products (which contain arachidonic acid), as well as corn oil, sunflower seed oil, safflower seed oil, mixed vegetable oils (which overload the body with the type of fat that is converted to arachidonic acid). Thus, to minimize the production of PG-2, it is advisable to choose chicken, turkey, and fish instead of higher fat meat products, and choose non-fat or 1% milk and yogurt products, and exclude from your diet any cheese that is more than 3% milk fat. As well, use olive oil and canola oil instead of other vegetable oils in salad dressings, and to sauté vegetables. Peanut oil can be used for stir-fries if desired, but no oil can be safely used for deep-frying, which should be avoided. Note that olive oil and canola oil are good sources of monounsaturated fat (oleic acid; an omega-9 fatty acid), which does not participate in the formation of prostaglandin synthesis, but is known to help reduce cholesterol and support cardiovascular health. 1,6,7

## Supplementing With Essential Fatty Acids

In addition to preventing the formation of PG-2, it is highly useful to supplement your diet with essential fatty acids that promote the production of PG-1 and PG-3. These essential fatty acids support the optimal expression of good health by suppressing inflammation, dilating blood vessels, helping to prevent abnormal blood clotting, slowing the rate of cell division, and improving the smoothness and softness of the skin, as well as healing various skin conditions. In order to optimize the production of PG-1 and 3 hormones, individuals should consider supplementing their diet with an essential fatty acid product (GMO free) containing a combination of flaxseed oil, borage oil and a high-yield fish oil (30% EPA/20%DHA). Flaxseed oil is a rich source of alpha-linolenic acid (an omega-3 fat), which the body can use to form PG-3. EPA and DHA (eicopentaenoic acid and docosahexaenoic acid) are the omega-3 fats found in fish. EPA can be converted to PG-3, DHA is required for brain development, vision, immune function, and for synthesis of the myelin sheath, that insulates many nerves throughout the body. 1,6,7,8,9 Borage oil is a rich source of GLA (gamma-linolenic acid), which is used to synthesize PG- 1. Diabetics and individuals who suffer from eczema, PMS and immune dysfunction have been shown to produce insufficient amounts of GLA, which often worsens these conditions.10,11,12,13 As well, the aging process alone and the consumption of alcohol, saturated fat, hydrogenated fats and refined sugar tend to reduce the body's ability to produce adequate amounts of GLA over our lifetime. Thus, borage oil (22% GLA) is a valuable medicinal oil to help the body produce more optimal levels of PG- 1 hormones. 5

## Therapeutic Application of Essential Oil Supplementation

Studies have shown that supplementation with GLA can reduce pain and swelling in arthritis (including rheumatoid arthritis), improve fibrocystic breast disease, PMS, and skin lesions, such as eczema, largely due to increased production of PG-1. 13,14,15,16

Studies suggest the commonly reported deficiency in omega-3 fats is associated with an increased risk of heart disease, attention deficit hyperactivity disorder, allergies and asthma, and skin disorders such as eczema and psoriasis.17, 18, 19, 20 A number of clinical trials have shown that supplementation with omega-3 fats (fish and/or flaxseed oil) can increase synthesis of PG-3 and help improve inflammatory conditions, such as arthritis and Crohn's disease, as well as high blood pressure, Raynaud's disease, eczema, and other conditions 3, 21, 22, 23, 24, 25, 26, 27, 28

## Summary

Unknowingly, most individuals suffer from an essential fatty acid deficiency or imbalance, which has been shown to contribute to numerous health disorders, accelerated aging, and/or poor complexion and skin texture. Thus, to ensure optimal essential fatty acid status it is advisable to follow the dietary recommendations outlined above and take an essential oils supplement each day that contains omega 3, 6 and 9 fatty acids, derived from equal amounts (e.g. 400 mg each) of GMO-free flaxseed oil, borage oil, and a high yield fish oil (30% EPA/20DHA). For general health maintenance, I suggest two, 1200 mg capsules per day. This simple practice can produce significant effects on your health, your appearance, and your risk of future illness.

## REFERENCES


1. Dietary Supplement Information bureau (Dietary Supplement Education Alliance, U.S.A.) www.supplementinfo.org/omega-6 fatty acids, omega-3 fatty acids
2. Maes M, Christophe A, Bosmans E, et al. In humans, serum polyunsaturated fatty acid levels predict the response of proinflammatory cytokines to psychological stress. Biol Psychiatry 2000;47:910–20.
3. DiGiacoma RA, Kremer JM, Shah DM. Fish-oil dietary supplementation in patients with Raynaud's phenomenon: a double-blind, controlled, prospective study. Am J Med 1989;86:158–64.
4. Joe LA, Hart LL. Evening primrose oil in rheumatoid arthritis. Ann Pharmacother 1993;27:1475–7 [review].
5. Horrobin DF. The importance of gamma-linolenic acid and prostaglandin E1 in human nutrition and medicine. J Holistic Med 1981;3:118–39.
6. Health Notes. www.puritan.com/Health Notes/Supp/EPA
7. Murray M. Encyclopedia of Nutritional Supplements. (Prima publishing, 1996):239-278
8. Gibson RA, Neumann MA, Makrides M. Effect of dietary docosahexaenoic acid on brain composition and neural function in term infants. Lipids 1996;31:177S–81S.
9. Makrides M, Neumann MA, Gibson RA. Is dietary docosahexaenoic acid essential for term infants? Lipids 1996;31:115–9.
10. Horrobin DF, Manku M, Brush M, et al. Abnormalities in plasma essential fatty acid levels in women with pre-menstrual syndrome and with non-malignant breast disease. J Nutr Med 1991;2:259–64.
11. Keen H, Payan J, Allawi J, et al. Treatment of diabetic neuropathy with gamma-linolenic acid. Diabetes Care 1993;16:8–15.
12. Manku MS, Horrobin, DF, Morse NL, et al. Essential fatty acids in the plasma phospholipids of patients with atopic eczema. Br J Derm 1984;110:643.
13. Horrobin DF. Essential fatty acids in clinical dermatology. J Am Acad Dermatol 1989;20:1045–53
14. Leventhal LJ, et al. Treatment of Rheumatoid Arthritis with Gammalinolenic Acid. Ann Intern Med. Nov1993;119(9):867-73.
15. Holland PA, et al. Drug Therapy of Mastalgia. What are the Options? Drugs. Nov1994;48(5):709-16.
16. Pye JK, et al. Clinical Experience of Drug Treatments for Mastalgia. Lancet. Aug1985;2(8451):373-77.
17. Stevens L, Zentall SS, Deck JL. Essential fatty acid metabolism in boys with attention-deficit hyperactivity disorder. Am J Clin Nutr. 1995;62:761-768.
18. Galland L. Increased Requirements for Essential Fatty Acids in Atopic Individuals: A Review with Clinical Descriptions. J Am Coll Nutr. 1986;5(2):213-28.
19. Masuev KA. The Effect of Polyunsaturated Fatty Acids of the Omega-3 Class on the Late Phase of the Allergic Reaction in Bronchial Asthma Patients. Ter Arkh. 1997;69(3):31-33.
20. Isseroff RR. Fish Again for Dinner! The Role of Fish and other Dietary Oils in the Therapy of Skin Disease. J Am Acad Dermatol. Dec1988;19(6):1073-80.
21. Kinsella JE, et al. Dietary n-3 Polyunsaturated Fatty Acids and Amelioration of Cardiovascular Disease: Possible Mechanisms. Am J Clin Nutr. Jul1990;52(1):1-28.
22. Garg ML, et al. Alpha-linolenic Acid and Metabolism of Cholesterol and Long-chain Fatty Acids. Nutrition. Jun1992;8(3):208-10.
23. Knapp HR, et al. The Antihypertensive Effects of Fish Oil. A Controlled Study of Polyunsaturated Fatty Acid Supplements in Essential Hypertension. N Engl J Med. Apr1989;320(16):1037-43.
24. Harris WS, Park Y, Isley WL. Cardiovascular disease and long-chain omega-3 fatty acids. Curr Opin Lipidol. 2003 Feb;14(1):9-14.
25. Calder PC. Dietary modification of inflammation with lipids. Proc Nutr Soc. 2002 Aug;61(3):345-58.
26. Geusens P, et al. Long-term Effect of Omega-3 Fatty Acid Supplementation in Active Rheumatoid Arthritis. A 12-month, Double-blind, Controlled Study. Arthritis Rheum. Jun1994;37(6):824-29.
27. Mate J, Castanos R, Garcia-Samaniego J, Pajares JM. Does dietary fish oil maintain the remission of Crohn's disease: a case control study. Gastroenterology 1991;100:A228 [abstract].
28. Kremer JM, Lawrence DA, Petrillow GF, et al. Effects of high¬dose fish oil on rheumatoid arthritis after stopping nonsteroidal antiinflammatory drugs. Arthritis Rheum 1995;38:1107–14.