

## **THE SECRET TO SOFT, SMOOTH SKIN**

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One of the best kept secrets in the health and beauty world is that nutritional supplementation with the right dosage and combination of essential oils (flaxseed oil, borage oil and fish oil) is a surefire way to enhance the softness and smoothness of the skin of the entire body, and is a proven therapeutic intervention in the management of eczema and some cases of psoriasis. In recent years, researchers have been able to determine the reason why these particular essential fats are so critical to the formation of soft, smooth skin texture, and the management of certain skin conditions. Investigative studies have shown that the link between fabulous skin texture and the intake of essential oils is explained by the effect that essential fats have on the synthesis of prostaglandin hormones within epidermal cells.

It has now been confirmed that, like many other tissues, developing skin cells (below the surface) extract essential fats from the bloodstream and convert them into mini-hormones known as prostaglandins. Scientific investigation reveals that different types of unsaturated fats are used by skin cells (epidermal cells) to make different types of prostaglandin hormones. We now know, for instance, that prostaglandin series-2 makes the skin dry, rough and/or scaly, whereas prostaglandin series-1 and series-3 make the skin soft, smooth and moist. Unfortunately, the North American diet is loaded with the type of unsaturated fat that favors the production of prostaglandin series-2. As a result, most people do not achieve the degree of skin softness and smoothness that is available to them, even if they have very good genetics regarding skin texture. In fact, every single client that you encourage to supplement their diet with the right combination of flaxseed oil, borage oil and fish oil will notice a marked improvement in their skin texture within the first month of supplementation. As such, skin care professionals should be aware of the mechanism of action through which essential fatty acid supplementation acts to improve skin texture and appearance. (1,2,3,4)

### **Prostaglandin Series 2 (PG-2) –The undesirable prostaglandin**

Within epidermal cells PG-2 is formed from the unsaturated fat known as arachidonic acid, which is found in rich concentrations in high fat meats and high fat dairy products. As well, the over-consumption of linoleic acid (an unsaturated fat found in corn oil, sunflower seed oil and safflower seed oil, and mixed vegetable oils) encourages the conversion of linoleic acid to arachidonic acid by the body, adding to the cell membrane concentrations of arachidonic acid. Higher cell membrane concentrations of arachidonic acid, from the over-consumption of these foods, tends to favor the synthesis of PG-2, contributing to poor skin texture and appearance. Unfortunately, the typical North American diet is a rich source of arachidonic acid and linoleic acid, and thus, most individuals produce too much PG-2 in their epidermal cells, which results in skin texture and appearance that is much less smooth and soft than is attainable, and contributes to a host of poor complexion problems and aggravates skin problems such as eczema and psoriasis. (2,4) Experimental studies also show that skin cells that exhibit a high concentration of arachidonic acid are more prone to undergoing cancerous and inflammatory changes upon exposure to ultra-violet light than are skin cells that have higher concentrations of omega-3 fats. This appears to be due to the fact that the

conversion of arachidonic acid to PG-2 produces an effect whereby skin cells divide at a much faster rate, which makes them more prone to cancerous mutations and inflammatory responses. Conversely, omega-3 fats, from flaxseed oil and fish oil, have been shown to slow the division rate of skin cells via their effects on promoting the formation of PG-3 which, in turn, reduces the incidence of mutations and inflammatory response by skin cells even when exposed to ultra-violet light. Thus, omega-3 fat supplementation is not only an important intervention to improve skin texture, but may help guard against the development of skin cancer and slow skin aging. (5)

### **Prostaglandin Series 1 (PG-1)**

In contrast to the deleterious effects of PG-2 on the skin, prostaglandin series 1 (PG-1) and prostaglandin series 3 (PG-3) make the skin soft, smooth, silky and moist. The key building block for PG-1 is an unsaturated fat known as GLA (gamma-linolenic acid), which is found in high concentrations in borage oil (22% yield, whereas evening primrose oil is only a 9% yield). GLA can also be formed in the body from linoleic acid, but individuals with certain conditions (diabetes, eczema) have been shown to have a defect in the enzyme that converts linoleic acid to GLA (delta-6 desaturase enzyme). As well, the consumption of alcohol, refined sugars, and hydrogenated fats tends to inhibit the conversion of linoleic acid to GLA. The aging process itself also slows the conversion of linoleic acid to GLA as the delta-6 desaturase enzyme becomes more sluggish. As such, most, if not all, individuals have sub-optimal cell membrane concentrations of GLA, and thus, GLA supplementation (e.g. borage oil) has been shown to improve skin texture and various skin conditions (eczema) in human studies via its conversion to PG-1 within epidermal cells. (2,6,7,8,9) Also note that the commonly seen sub-optimal intake of Vitamin B6, zinc and magnesium slows the conversion of linoleic acid to GLA, as these nutrients act as co-enzymes in this biochemical reaction. (2,3)

### **Prostaglandin Series 3 (PG-3)**

PG-3 also makes the skin very smooth, soft, silky and moist. PG-3 is formed from the omega-3 unsaturated fat known as EPA (eicosapentaenoic acid), which is found in cold-water marine fish such as salmon, mackerel, anchovies, sardines, and tuna, and supplements containing EPA. The body can also convert the omega-3 unsaturated fat ALA (alpha-linolenic acid) into EPA, increasing the production of PG-3. ALA is found in rich concentrations in flaxseed oil (58% yield). Thus, supplementation with flaxseed oil and/or a high-yield fish oil have been shown to significantly increase production of PG-3, improving skin texture and appearance, as well as certain skin conditions (psoriasis and eczema). Fish oil also contains DHA (docosahexaenoic acid), which the body can convert into EPA and thus, PG-3, if required. DHA is also used to promote the development and function of the brain and is required for vision. (2,3,10,11,12)

PG-3 is considered to be very important for total body wellness as it also reduces risk of heart attacks by dilating blood vessels and reducing abnormal blood clotting. PG-3 has been shown to reduce cancer risk by slowing down the cell division rates (more rapid cell division leads to increased genetic mutations and thus, increased formation of cancer cells, with less time for DNA repair enzymes to correct the mistakes). (2) This has also been shown to be true with respect to skin cancer in experimental studies, whereby higher PG-2 levels in skin cells produced a significantly higher yield of cancer development upon exposure to ultra-violet light. PG-3 is also known to reduce

inflammation (including skin inflammatory responses), a role it shares with PG-1. (5) Thus, supplementation with borage oil, flaxseed oil and a high-yield fish oil (30% EPA/20% DHA) is not only beneficial to improve skin texture and appearance, and to treat certain skin conditions, but it is also of value in the global prevention of heart and cardiovascular disease, cancer, and in the management of inflammatory conditions such as arthritis, Crohn's disease, colitis, diabetic neuropathies, skin inflammatory conditions, etc. (2)

### **Vitamins and Minerals As Co-Factors For Prostaglandin Synthesis**

It should be noted that certain vitamins and minerals are required as co-factors in the enzymatic reactions that allow skin cells to convert essential oils (flaxseed, borage and fish oils) into PG-1 and PG-3. For example, the conversion of ALA to EPA requires optimal nutritional status of Vitamin B6, zinc, magnesium, and niacin (Vitamin B3), as coenzymes. As well, the synthesis of PG-1 and PG-3 also requires optimal intake of Vitamin C, Vitamin E, and selenium. These antioxidants affect the enzyme cyclooxygenase, which is the final enzyme in the conversion of essential fats to PG-1 and PG-3.

Also note that supplementation with omega-3 fats (ALA, EPA and DHA) also inhibit the conversion of GLA to arachidonic acid by inhibiting the delta-5 desaturase enzyme. Thus, ALA, EPA and DHA not only increase the synthesis of PG-3, but they help to inhibit the cell membrane build up of arachidonic acid, and thus, PG-2 synthesis. (2,3)

### **Summary and Conclusion**

Clinical and investigative studies now confirm that supplementation with a combination of flaxseed, borage and fish oils, at the correct dosages, is an important step to improving skin texture, complexion and the treatment of certain skin disorders (eczema, psoriasis, some cases of acne), due to their effects on promoting the synthesis of prostaglandin series-1 and prostaglandin series-3 within developing skin cells. As well, higher skin cell concentrations of omega-3 fats (from fish and flaxseed oil) may offer additional protection against ultra-violet light-induced skin cancer and photo-aging of the skin, according to emerging experimental data. Thus, essential fatty acid supplementation represents an important component of lifelong skin care management for virtually all clients and patients. Skin care professionals should keep in mind that optimal doses of certain vitamins and minerals are required to facilitate the efficient conversion of GLA (from borage oil) to PG-1 and ALA and EPA (from flaxseed and fish oil, respectively) to PG-3. Here is a practical guide to help translate this information into a step-by-step daily formula for your clients and patients:

1. To reduce the buildup of arachidonic acid (and thus PG-2 synthesis), avoid or restrict the intake of high fat meat and high fat dairy products (chicken, turkey and fish are good alternatives as well as non-fat milk and yogurt, and cheeses that are less than 4% milk fat). Substitute olive oil, canola oil and peanut oil in place of corn oil, sunflower seed oil, safflower seed oil and mixed vegetable oils, for salad dressings, stir-fries and to sauté vegetables. Consume alcohol in moderation, if at all, and reduce intake of refined sugars and hydrogenated fats.
2. To enhance the production of PG-1 and PG-3 (which improve the softness and smoothness of the skin and help alleviate certain skin conditions), supplement the

diet with an all-in-one essential fatty acid supplement providing 400 mg each of flaxseed, borage and fish oils (1,200 mg capsule). For best results take 2-3 capsules per day. The fish oil should yield 30% EPA and 20% DHA content. Clients and patients should also be encouraged to eat more fish.

3. To facilitate the conversion of essential fats to PG-1 and PG-3, a high potency multi-vitamin formula should be taken that provides the following daily dosages: Vitamin C-1,000 mg; Vitamin E-400 IU (all natural); Beta-carotene-10,000 IU; Selenium-100 mcg; Zinc-15 mg; Vitamin A-2,500 IU, and a B-50 complex (as well as all other vitamins and minerals from Vitamin A to Zinc).

From clinical experience I can assure you that your clients and patients will notice a marked improvement in skin texture and smoothness, usually within the first month of following this program. In fact, essential fatty acid supplementation, in conjunction with optimizing vitamin and mineral nutritional status, are proving to be the missing links in skin care management. Scientific studies have now confirmed their appropriate use is an essential step to enhance skin texture and appearance, and act as complementary agents in the treatment of certain skin conditions. The time has come to advise clients and patients about the appropriate use of nutritional supplements as a vital component of lifelong skin care management and health-promotion.

My personal recommendation is to take:

- Adeeva Nature's Essential Oils – 3 capsules per day (fish, flaxseed and borage seed oil – all in one capsule)
- Adeeva Multiple Vitamin and Mineral – full adult dose

This combination of nutrients enables the skin to achieve its full, soft, smooth and radiant potential and slow important aspects of skin aging.

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