

SUPPLEMENTS FOR SKIN HEALTH

Note: Please refer to the [Passport to Whole Health](#), Chapter 15 on Dietary Supplements for more information about how to determine whether or not a specific supplement is appropriate for a given individual. Supplements are not regulated with the same degree of oversight as medications, and it is important that clinicians keep this in mind. Products vary greatly in terms of accuracy of labeling, presence of adulterants, and the legitimacy of claims made by the manufacturer.

Healthy dietary choices are important for overall health. Anti-inflammatory or Mediterranean-style dietary approaches have been found to enhance many aspects of health—especially in the setting of inflammatory diseases.[1] Additionally, low glycemic index/low glycemic load diets have been shown to have significant benefit—not only for overall health, but for improving some skin conditions as well as for slowing signs of aging.[2,3] Supplements can give an added boost to disease prevention and/or minimizing the effects of chronic conditions. The discussion that follows highlights some of the supplements that have shown particularly beneficial for the skin.

OMEGA-3 FATTY ACIDS

Omega-3 fatty acids have been shown to decrease the production of inflammatory compounds and of insulin and insulin-related compounds—all of which contribute to impaired function of the skin. These essential fatty acids have been shown helpful in specific skin conditions such as eczema, psoriasis, acne, and skin cancer.[4] The inflammatory markers that are inhibited by omega-3 fatty acids impact collagen and other structural proteins that function to support the skin and underlying tissues. In this way, omega-3 fatty acids may help slow the appearance of visual characteristics of aging.

Ideally, omega-3 fatty acids would come from foods such as fatty fish (salmon, mackerel, and sardines), flaxseeds, and walnuts. When that is not possible, supplements can be helpful. For more information, refer to the section on fats in the Whole Health overview [“Food and Drink.”](#)

Dose[5]:

- 1 tbsp of flax oil for every 100 lb daily
- 1-2 tbsp ground flaxseeds daily
- 1-2 gm fish oil capsules twice a day

GAMMA-LINOLEIC ACID (GLA)

GLA is an omega-6 polyunsaturated fatty acid that has anti-inflammatory properties. It is found in borage oil, evening primrose oil, hemp oil, and black current oil. It has been shown to be potentially helpful in atopic dermatitis (eczema).[6,7] Research, however, has been conflicting. Overall, GLA is safe. Gastrointestinal side effects are the most common

and are generally reversible. There may be increased risk of bleeding when taken along with other blood thinners.

Dose[6,7]:

- 920 mg daily for people 18 and older
- 360-460 mg daily for people younger than 18

PROBIOTICS

Specific strains of probiotics have been shown to limit ultraviolet damage (*Lactobacillus johnsonii*) and to decrease skin sensitivity as well as increase recovery time after physical damage (*Lactobacillus paracasei*).[8,9] Probiotics have potential benefits in several skin conditions including atopic dermatitis (especially when taken by the mother in the perinatal and nursing time periods), rosacea, and acne. Diet appears to play a significant role in supporting a healthy gut microflora, and effects of supplemental probiotics may be optimized by following a plant-based diet.[10]

Probiotics have also been shown to improve wound healing in both GI ulcers and in infected skin wounds through a variety of proposed mechanisms.[11] Given the increasing rates of resistance, this is a promising area for development of new ways to treat skin infections.

There are many strains of probiotics, and comparing studies is difficult since the studies use different strains and different concentrations of probiotics. Additional research will help clarify the specific doses and strains that are most likely to be helpful for skin health.

For more information, refer to the Whole Health tool “[Promoting a Healthy Microbiome with Food and Probiotics.](#)”

CAROTENOIDS

The carotenoids are pigmented molecules made by plants that have powerful antioxidant properties. Beta-carotene and lycopene are two that have been linked to skin health.

Beta-carotene is considered a provitamin because it is converted to vitamin A in the body. Several studies have found decreased rates of many types of cancer in people who regularly eat foods rich in beta-carotene, but studies looking at actual blood levels of beta-carotene and supplementation in people with skin cancer have not shown benefit.[12] Supplementation may be risky in some people (heavy smokers), though it appears beneficial in generally healthy people.[13] Foods rich in beta-carotene are a staple in anti-inflammatory and Mediterranean-style diets. These foods are high in other antioxidants as well as fiber—both of which are beneficial for many aspects of health.

Food sources: leafy greens, carrots, sweet potatoes, sweet peppers, dried apricots, peas, broccoli, squash, cantaloupe.

Lycopene is a powerful antioxidant and has been identified as having potent photoprotective properties.[14] Tomatoes and tomato-based products have the highest concentrations of lycopene, and the concentration increases with cooking. Watermelon and pink grapefruit are also good food sources of lycopene. The Observed Safe Level (OSL) for lycopene indicates strong evidence of long-term safety with supplementation up to 75 mg/day.[15]

TURMERIC (CURCUMIN)

Curcumin is the major active component of turmeric. It has strong antibacterial, anti-inflammatory, and anticancer properties.[12] Curcumin has been shown to improve wound healing, psoriasis, and skin cancer, and there is evidence that its anti-inflammatory properties could be helpful in any inflammatory skin disease.[16] Turmeric has been studied in a wide variety of skin conditions and over half have shown benefit.[17] There is still more work needed in this area to clarify appropriate application of the herb, degree of benefit that can be expected, and the mechanisms by which turmeric results in improvement in skin disease.

Currently, the ideal dose for skin health is unknown. Curcumin can be obtained through diet or by taking capsules of turmeric powder. Clinical studies have found turmeric powder safe at doses up to 8-12 gm/day with the primary side effect being reversible gastrointestinal problems (nausea and diarrhea).[18]

FLAVONOIDS

Flavonoids make up a large class of protective molecules that are synthesized by plants. They are powerful antioxidants and have the ability to regulate pathways involved in cell processes such as cell growth, differentiation, and cell death.[19] Beneficial effects on cancer include limiting inflammation, inhibiting proliferation of abnormal cells, and blocking cancerous cells from invading normal tissue. Foods rich in flavonoids include red, blue, and purple berries; red and purple grapes; plums; red and yellow onions; green and black tea; apples; dark chocolate; fresh parsley; kale; broccoli; and citrus fruits.

Green tea contains the flavonoid epigallocatechin-3-gallate (EGCG). It has many anticancer effects as well as antioxidant and photoprotective effects.[20,21] Topically, it may help with acne as well as overgrown scars.[22,23] Clinical studies in humans are lacking, and an ideal dose for supplementation is not known. Green tea is easily accessible, safe, and inexpensive.

Suggestion: Drink 2 or more cups of green tea daily.

Soy isoflavones are also members of the flavonoid family. They have weak estrogen-like effects on human tissues. They also appear to inhibit enzymes that are involved in skin breakdown.[24] Both oral supplementation and topical preparations may reduce wrinkling and other signs of aging.[25] The use of these compounds in people who have breast cancer has been an area of considerable debate. Due to the confusing data, some

experts recommend that women with a history of breast cancer (especially estrogen receptor positive breast cancer) avoid increasing soy isoflavones in their diets. Others feel that moderate consumption of soy protein will not likely be harmful and may be beneficial.[26,27] It very well may be that natural food sources of these isoflavones may be helpful while concentrated supplements may be harmful.

RESVERATROL

Resveratrol is a compound naturally produced by plants to protect them from infection by bacteria and fungus. It has exhibited inhibitory activity of transcription factors and enzymes involved in inflammatory pathways.[28] It has also been shown to inhibit a variety of different human cancer cells including melanoma and to inhibit factors that allow cancer cells to spread to other tissues.[29] Although human studies are limited, supplementation appears safe. Resveratrol is concentrated in the skin of grapes and is found in highest concentrations in wine and grape-based products. Other sources include berries (blueberries, bilberries, cranberries), peanuts (boiled have the highest levels, raw peanuts and peanut butter have lower levels), and the roots of Japanese knotweed (*Polygonum cuspidatum*).

MULTIVITAMIN

There is evidence that vitamin A, vitamin B complex, vitamin C, vitamin D, vitamin E, biotin, and the minerals chromium, iron, selenium, and zinc play important roles in maintaining skin health. Additional supplementation may be helpful for specific skin conditions. While a detailed account of the impact individual vitamins and minerals have on the skin is beyond the scope of this document, it is wise to take a regular multivitamin that contains 100% of the daily value for most vitamins and minerals, particularly for those who have limited access to food sources of these important nutrients.

For guidance on choosing a multivitamin refer to “Biologically-Based Approaches: Dietary Supplements,” Chapter 15 of the [Passport to Whole Health](#).

COLLAGEN

Collagen supplementation has become popular in the last few years and anecdotal evidence abounds regarding its benefits. There are some good-quality studies looking at short-term collagen supplementation (between 8 and 24 weeks) that show positive impact on wound healing and reducing signs of aging—particularly in the areas of elasticity, collagen density of the dermis, and skin hydration.[30] Because this is an unregulated supplement, care should be taken when choosing a product. Consideration of sourcing and third-party quality control is important.

Dose: 2.5-10 gm a day

RESOURCE LINKS

- [Passport to Whole Health](https://wholehealth.wiscweb.wisc.edu/wp-content/uploads/sites/414/2018/09/Passport-to-Whole-Health-3rd-Edition-2018.pdf): <https://wholehealth.wiscweb.wisc.edu/wp-content/uploads/sites/414/2018/09/Passport-to-Whole-Health-3rd-Edition-2018.pdf>
- [Food and Drink](https://wholehealth.wisc.edu/overviews/food-drink/): <https://wholehealth.wisc.edu/overviews/food-drink/>
- [Promoting a Healthy Microbiome with Food and Probiotics](https://wholehealth.wisc.edu/tools/promoting-healthy-microbiome-with-food-probiotics/): <https://wholehealth.wisc.edu/tools/promoting-healthy-microbiome-with-food-probiotics/>

AUTHOR(S)

“Supplements for Skin Health” was written by [Apple Bodemer](#), MD (2014, updated 2020).

This Whole Health tool was made possible through a collaborative effort between the University of Wisconsin Integrative Health Program, VA Office of Patient Centered Care and Cultural Transformation, and Pacific Institute for Research and Evaluation.

REFERENCES

- 1 Galland L. Diet and inflammation. *Nutr Clin Pract*. 2010;25(6):634-640.
- 2 Brand-Miller JC. Glycemic load and chronic disease. *Nutr Rev*. 2003;61(5 Pt 2):S49-55.
- 3 de Carvalho Vidigal F, Guedes Cocate P, Goncalves Pereira L, de Cassia Goncalves Alfenas R. The role of hyperglycemia in the induction of oxidative stress and inflammatory process. *Nutr Hosp*. 2012;27(5):1391-1398.
- 4 McCusker MM, Grant-Kels JM. Healing fats of the skin: the structural and immunologic roles of the omega-6 and omega-3 fatty acids. *Clin Dermatol*. 2010;28(4):440-451.
- 5 *Integrative Medicine*. 2nd ed. Philadelphia, PA: Elsevier Saunders; 2007.
- 6 Takwale A, Tan E, Agarwal S, et al. Efficacy and tolerability of borage oil in adults and children with atopic eczema: randomised, double blind, placebo controlled, parallel group trial. *BMJ*. 2003;327(7428):1385.
- 7 Borrek S, Hildebrandt A, Forster J. [Gamma-linolenic-acid-rich borage seed oil capsules in children with atopic dermatitis. A placebo-controlled double-blind study]. *Klin Padiatr*. 1997;209(3):100-104.
- 8 Gueniche A, Philippe D, Bastien P, Blum S, Buyukpamukcu E, Castiel-Higounenc I. Probiotics for photoprotection. *Dermatoendocrinol*. 2009;1(5):275-279.
- 9 Gueniche A, Philippe D, Bastien P, et al. Randomised double-blind placebo-controlled study of the effect of *Lactobacillus paracasei* NCC 2461 on skin reactivity. *Benef Microbes*. 2014;5(2):137-145.
- 10 Tachon S, Lee B, Marco ML. Diet alters probiotic *Lactobacillus* persistence and function in the intestine. *Environ Microbiol*. 2014;16(9):2915-2926.
- 11 Lukic J, Chen V, Strahinic I, et al. Probiotics or pro-healers: the role of beneficial bacteria in tissue repair. *Wound Repair Regen*. 2017;25(6):912-922.

- 12 Millsop JW, Sivamani RK, Fazel N. Botanical agents for the treatment of nonmelanoma skin cancer. *Dermatol Res Pract.* 2013;2013:837152.
- 13 Goralczyk R. Beta-carotene and lung cancer in smokers: review of hypotheses and status of research. *Nutr Cancer.* 2009;61(6):767-774.
- 14 Stahl W, Heinrich U, Aust O, Tronnier H, Sies H. Lycopene-rich products and dietary photoprotection. *Photochem Photobiol Sci.* 2006;5(2):238-242.
- 15 Shao A, Hathcock JN. Risk assessment for the carotenoids lutein and lycopene. *Regul Toxicol Pharmacol.* 2006;45(3):289-298.
- 16 Thangapazham RL, Sharma A, Maheshwari RK. Beneficial role of curcumin in skin diseases. *Adv Exp Med Biol.* 2007;595:343-357.
- 17 Vaughn AR, Branum A, Sivamani RK. Effects of turmeric (*curcuma longa*) on skin health: a systematic review of the clinical evidence. *Phytother Res.* 2016;30(8):1243-1264.
- 18 Pari L, Tewas D, Eckel J. Role of curcumin in health and disease. *Arch Physiol Biochem.* 2008;114(2):127-149.
- 19 Williams RJ, Spencer JP, Rice-Evans C. Flavonoids: antioxidants or signalling molecules? *Free Radic Biol Med.* 2004;36(7):838-849.
- 20 Lin JK, Liang YC. Cancer chemoprevention by tea polyphenols. *Proc Natl Sci Counc Repub China B.* 2000;24(1):1-13.
- 21 Yusuf N, Irby C, Katiyar SK, Elmets CA. Photoprotective effects of green tea polyphenols. *Photodermatol Photoimmunol Photomed.* 2007;23(1):48-56.
- 22 Elsaie ML, Abdelhamid MF, Elsaie LT, Emam HM. The efficacy of topical 2% green tea lotion in mild-to-moderate acne vulgaris. *J Drugs Dermatol.* 2009;8(4):358-364.
- 23 Park G, Yoon BS, Moon JH, et al. Green tea polyphenol epigallocatechin-3-gallate suppresses collagen production and proliferation in keloid fibroblasts via inhibition of the STAT3-signaling pathway. *J Invest Dermatol.* 2008;128(10):2429-2441.
- 24 Kim SY, Kim SJ, Lee JY, et al. Protective effects of dietary soy isoflavones against UV-induced skin-aging in hairless mouse model. *J Am Coll Nutr.* 2004;23(2):157-162.
- 25 Jenkins G, Wainwright LJ, Holland R, Barrett KE, Casey J. Wrinkle reduction in post-menopausal women consuming a novel oral supplement: a double-blind placebo-controlled randomized study. *Int J Cosmet Sci.* 2014;36(1):22-31.
- 26 Shu XO, Zheng Y, Cai H, et al. Soy food intake and breast cancer survival. *JAMA.* 2009;302(22):2437-2443.
- 27 Messina MJ, Loprinzi CL. Soy for breast cancer survivors: a critical review of the literature. *J Nutr.* 2001;131(11 Suppl):3095s-3108s.
- 28 de la Lastra CA, Villegas I. Resveratrol as an anti-inflammatory and anti-aging agent: mechanisms and clinical implications. *Mol Nutr Food Res.* 2005;49(5):405-430.
- 29 Aggarwal BB, Bhardwaj A, Aggarwal RS, Seeram NP, Shishodia S, Takada Y. Role of resveratrol in prevention and therapy of cancer: preclinical and clinical studies. *Anticancer Res.* 2004;24(5a):2783-2840.
- 30 Choi FD, Sung CT, Juhasz ML, Mesinkovsk NA. Oral collagen supplementation: a systematic review of dermatological applications. *J Drugs Dermatol.* 2019;18(1):9-16.