

ROLE OF VITAMIN E, K, AND F IN SKIN REJUVENATION

The skin is the largest organ of the human body. It is composed of the epidermis, which consists of epithelial tissue, and the dermis, which consists of connective tissue. Under the dermis, there is a layer of subcutaneous tissue called the hypodermis.

Human skin is continually changing. The condition of the skin largely depends on the individual's overall state of health. A balanced diet plays an important role in the proper functioning of the human body, including the skin.

The following subject draws attention to three bioactive substances – vitamin E, K and F. ⁽¹⁾

VITAMIN E:

Vitamin E is a group of lipophilic compounds that includes four tocopherols (α -, β -, γ - and δ -tocopherol) and four tocotrienols (α -, β -, γ - and δ -tocotrienol). ⁽²⁾

Vitamin E is exclusively synthesized by plants, and all forms are supplied to the human body by food. ⁽³⁾

Alpha-tocopherol is the most important form, showing an affinity for the specialized protein alpha-TTP, which binds and transports this form of the vitamin. The remaining dietary forms are metabolized in the liver and eliminated from the body with bile. ⁽⁴⁾

Vitamin E plays an important role in maintaining skin health. The most probable physiologic function of epidermal vitamin E is contributing to the antioxidant defences of the skin and protecting the epidermis and dermis against oxidative stress induced by environmental factors. Vitamin E is the major lipid-soluble antioxidant in humans. ⁽⁵⁾

Owing to the antioxidant properties of vitamin E and its ability to scavenge free radicals and become part of lipid structures, it protects against lipid peroxidation and slows skin ageing. ⁽⁶⁾

Alpha-tocopherol supplementation has been shown to improve facial hyperpigmentation.

Ichihashi et al., in an in vitro study using cultured human melanoma cells and normal human melanocytes, showed that **alpha-tocopherol inhibits tyrosine hydroxylase activity and suppresses melanogenesis.** ⁽⁷⁾

Thus, vitamin E may be a candidate whitening agent for the treatment of hyperpigmentation, including age-related conditions or those arising from sun exposure.

Some research also indicates that vitamin E displays strong photoprotective, firming, hydrating and anti-ageing properties, as well as improving the elasticity, structure and softness of the epidermis and dermis.

the topical application of alpha-tocopherol shows promising photoprotective effects, especially when combined with systemic and topical antioxidant substances such as vitamin C or carotenoids, controlled studies in humans are needed before vitamin E can be recommended as an effective cosmeceutical anti-ageing agent.

The available literature concerning the efficacy of the systemic and topical use of vitamin E is extensive, but the results are often contradictory and range from an improvement in skin appearance to no effect at all. ⁽⁸⁾

Vitamin E plays a role in the healing of wounds of varying aetiology; in the treatment of dermatological conditions such as subcorneal pustular dermatoses, cutaneous amyloidosis, atopic dermatitis, epidermolysis bullosa, psoriasis, acne vulgaris and scleroderma; in skin cancer prevention; and in the treatment of Hailey–Hailey disease. ⁽⁹⁾

FORMS OF VITAMIN E PRODUCTS FOR FACE:

THROUGH DIET: There's already enough vitamin E in the diet, but adding more through healthy foods could help speed up cell synthesis and feel healthier overall.

Foods that are high in vitamin E include **almonds, blackberries, and avocados.**

TOPICAL APPLICATION:

Vitamin E oil can be used on face as an overnight anti-aging treatment. Since vitamin E has a thick consistency, it's best to apply it before bed so that it can fully absorb.

Most over-the-counter anti-aging creams contain between **.05 and 1 percent Trusted Source** vitamin E as one of their active ingredients. Look for a product with a high concentration of vitamin E (alpha-tocopherol is often the ingredient name), or search for pure vitamin E oil.

VITAMIN E ORAL SUPPLEMENTS:

A benefit of vitamin E oral supplements may be glowing skin that looks younger. ⁽¹⁰⁾

Daily vitamin E intake for adults **shouldn't exceed 15 milligrams.** ⁽¹¹⁾

BENEFITS OF VITAMIN E:

Using vitamin E oil for your face can help you in several different ways.

HYPERPIGMENTATION

Dark patches on skin can be caused by too much melanin, which is triggered by hormones or other causes. Melasma, is believed to be treatable through the use of topical.

Hyperpigmentation may be only moderately affected by using topical vitamin E oil. The most effective way to use vitamin E to treat hyperpigmentation is to pair it with vitamin C.

PREVENTING AGING AND WRINKLES ON YOUR FACE

Vitamin E is high in antioxidants, and it affects blood circulation. That might be why people notice a difference in the firmness and structure of their skin after topical use of vitamin E oil.

A 2013 study tells us that vitamin E and other natural ingredients rich in antioxidants are generally accepted as a treatment for delaying wrinkles, also called photoaging. ⁽¹⁰⁾

VITAMIN E PRECAUTIONS AND SAFETY

Vitamin E isn't an effective remedy for everyone. If there is experience of frequent breakouts or have pores that clog easily, applying topical vitamin E oil could aggravate your symptoms.

Taking oral vitamin E supplements for a short duration is safe for most people, but taking them for over a year can cause vitamin E to accumulate inside body. Too much vitamin E in bloodstream can result in a reduced **platelet count and blood thinning**.

Taking **blood thinners** or having a **bleeding disorder**, consult physician for fitness before starting vitamin E oral supplements. ⁽¹⁰⁾

VITAMIN K:

Vitamin K is a fat-soluble vitamin, meaning it can dissolve in fats and oils and also stored in body fat. Technically known as phytonadione. It is a vitamin that is critical to the normal functioning of the many proteins within the body such as the coagulation factors that control bleeding. ⁽¹²⁾

Vitamin K1 is commonly found in green leafy vegetables, cucumbers, olive oil, soybean oil, and canola oil.

Vitamin K2 is found in butter, cheese, and egg yolk.

VITAMIN K BENEFITS FOR SKIN:

PROTECTS AGAINST OXIDATION:

Vitamin K has been found to work as a potent antioxidant. Antioxidants have always been acknowledged as an important substance in promoting beautiful and healthy skin as they prevent the harmful effects of free radicals. Free radicals are most commonly caused by exposure to smoke, environmental pollution, and the harmful rays of the sun.

Apart from its antioxidative property, vitamin K is also found to be **involved in tissue renewal and cell growth control**. These particular vitamin K effects are significant in maintaining a softer, glowing, and more young-looking complexion.

Vitamin K helps body to produce new skin cells. When this happens, the fresh and healthy skin cells will readily replace older skin cells which are dry and hard, particularly in your outer skin. As soon as the dead skin cells are eliminated, the new and fresher skin cells will be exposed.

REDUCES VISIBLE SIGNS OF SKIN AGING:

Wrinkles and fine lines are primarily caused by reduced collagen and elastin production. Collagen and elastin are crucial in maintaining the skin's elasticity or its ability to stretch.

Vitamin K helps protect the collagen in the body. When healthy collagen production is maintained, your skin appears more, plump, smooth and youthful. This means that skin will be able to maintain its elasticity, hence, preventing wrinkles and fine lines.

ADDRESSES DARK CIRCLES UNDER THE EYES:

The skin around the eye area is particularly delicate because it is extremely thin. Dark circles under the eyelids commonly occur because of the fragility of blood vessels. When the blood vessels break, blood leaks to the surrounding skin resulting in eventual discoloration. Not getting enough sleep, rubbing eyes, puffiness, and genetic factors all play a role in the dreaded under eye circles.

Vitamin K is known primarily for its anti-coagulant property which helps regulate bleeding. This property also helps in strengthening blood vessels to prevent breaking or damage. This means that vitamin K is effective in preventing the root cause of dark circles under the eyes. ⁽¹²⁾

FORMS OF VITAMIN K AVAILABLE:

TOPICAL APPLICATION:

A minimum 1% concentration of vitamin K1 has been shown in animal studies to positively influence wound healing by hastening the natural process damaged skin undergoes as it works to repair itself. It is not known if this principle would apply to intact skin showing signs of aging.

VITAMIN K FROM FOODS:

Good natural food sources of vitamin K include:

- Vegetables like spinach, asparagus, and broccoli
- Legumes like soybeans

Daily requirement with foods that have lesser amounts of vitamin K:

- Eggs
- Strawberries
- Meat like liver

ORAL SUPPLEMENTS

| | |
|---|-------------------|
| Women 19 and up | 90 micrograms/day |
| Women, pregnant or breastfeeding (19-50) | 90 micrograms/day |
| Women, pregnant or breastfeeding (under 19) | 75 micrograms/day |

| | |
|---------------|--------------------|
| Boys 14-18 | 75 micrograms/day |
| Men 19 and up | 120 micrograms/day |

RISKS OF VITAMIN K:

Side effects of oral vitamin K at recommended doses are rare.

Interactions. Many drugs can interfere with the effects of vitamin K. They include antacids, blood thinners, antibiotics, aspirin, and drugs for cancer, seizures, high cholesterol, and other conditions.

Risks. People using Coumadin for heart problems, clotting disorders, or other conditions may need to watch their diets closely to control the amount of vitamin K they take in. They should not use vitamin K supplements unless advised to do so by the health care provider. ⁽¹²⁾

VITAMIN F:

Vitamin F isn't actually a vitamin. It's made up of two kinds of polyunsaturated fatty acids. These fatty acids are alpha-linolenic acid (ALA) and linoleic acid (LA). ALA is an omega-3 fatty acid, and LA is an omega-6 fatty acid.

ALA and LA are essential fatty acids, which means one needs them to survive. They play an important role in keeping one's body running smoothly. The body doesn't produce all of the ALA and LA it needs to function properly. One needs to get most of these fatty acids from their diet.

Vitamin F in skincare products such as oils and creams aids in moisturizing skin, which may help with acne, dryness and wrinkles. The fatty acids can maintain a skin barrier, which can help with conditions such as atopic dermatitis and psoriasis.

BENEFITS OF VITAMIN F ON SKIN:

MAINTAINS MOISTURE BALANCE:

Vitamin F is known for its hydrating properties. Being an omega 6 essential fatty acid, it works by retaining the moisture in your skin and maintaining your natural moisture level.

FIGHTS AGAINST ACNE:

A study conducted in 1998 evaluated the topical application of Vitamin F on people with acne. The result showed that the pustules were reduced by 25% after one month of application

ANTI-INFLAMMATORY:

Having anti-inflammatory properties, Vitamin F is exceptionally beneficial for people with acne-prone skin or to those who have skin inflammation issues.

CONTROLS PSORIASIS:

While Vitamin F suits all skin types, it works best for people with sensitive skin. Skin conditions like psoriasis, seborrheic dermatitis and acne can be controlled to a certain extent by using Vitamin F.

BLOCKS UV RAYS:

Vitamin F is anti-inflammatory and also holds some immune properties. When your skin comes in contact with sunlight, Vitamin F tries to alter the reaction. So, if you have not worn your sunscreen for a day but have applied topical Vitamin F, your skin is safe for a while

PROTECTS THE SKIN BARRIER:

Linoleic acid of Vitamin F helps build the outermost layer of your skin. This layer protects you from the outside pathogens, bacteria, germs, UV light etc. The topical application of Vitamin F strengthens your skin's protective barrier.

ADDS GLOW TO SKIN:

Since it hydrates your skin, it reduces dryness. It makes your dull skin moisturized and charismatic. Your skin starts naturally glowing after a few days of applying Vitamin F

GOOD SOURCES OF VITAMIN F:

Most **plant-based food** sources provide both ALA and LA, but many contain a higher amount of one fatty acid than the other. Foods that naturally contain vitamin F include:

- **Nuts:** walnuts, hazelnuts, cashews, almonds, pine nuts.
- **Seeds:** flaxseed, chia seeds, sunflower seeds.
- **Oils:** flaxseed oil, canola oil, walnut oil, soybean oil.

Fish, such as salmon, tuna and sardines, may contain some ALA and LA, but they're mostly made up of other kinds of omega-6 and omega-3 fatty acids.

DAILY DOSAGE OF VITAMIN F:

| Age/Gender/Life Stage | Recommended Amount of |
|---|------------------------------|
| Birth to age 12 months* | 0.5 g |
| Children ages 1 to 3 years | 0.7 g |
| Children ages 4 to 8 years | 0.9 g |
| Children assigned male at birth (AMAB) ages 9 to 13 years | 1.2 g |

| Age/Gender/Life Stage | Recommended Amount of |
|---|-----------------------|
| Children assigned female at birth (AFAB) ages 9 to 13 years | 1.0 g |
| People AMAB ages 14 years and up | 1.6 g |
| People AFAB ages 14 years and up | 1.1 g |
| Pregnant people | 1.4 g |
| Breastfeeding people | 1.3 g |

SIDE EFFECTS OF VITAMIN F:

Omega-3 supplements don't usually cause any side effects. When side effects do occur, they're usually mild. Side effects may include:

- Unpleasant taste in your mouth.
- Bad breath (halitosis).
- Heartburn.
- Nausea.
- Stomach ache (abdominal pain).
- Diarrhea.
- Headache.
- Odorous sweat. ⁽¹³⁾

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