

# Vitamin K for a healthy and beautiful skin

published in Kosmetik International 2005 (7), 89

Vitamin K is an essential nutrient for the human body. Vitamin K belongs to the fat-soluble vitamins and naturally occurs in two different types, i.e. vitamin K<sub>1</sub> and vitamin K<sub>2</sub>. Vitamin K<sub>1</sub> is mainly assimilated through vegetable food whereas vitamin K<sub>2</sub> is formed by intestinal bacteria as e.g. Escherichia coli.

**V**egetable vitamin K<sub>1</sub> is an excellent ingredient in creams designed for the care of the skin susceptible to couperosis and rosacea. Beyond that, it is an appropriate recipe to reduce dark eye circles which frequently are caused by malfunction of the surface capillary system of the skin. Vitamin K<sub>1</sub> can either be applied as a cosmetic active agent respectively ampoule treatment on a long-term base whereas on the other hand it may be used as a supplement to the normal day and night skin care in combination with an appropriate base cream. Best availability of vitamin K<sub>1</sub> in ampoule products or active agents is guaranteed when the vitamin K<sub>1</sub> particles are encapsulated.

## A well-targeted supply of substances

Nanoparticles are an appropriate medium as they provide excellent penetrability and contain oils as a vehicle to transport the active agent to the respective area where it is needed. Vitamin K<sub>1</sub> may be used in concentrations up to 2 percent.

Nanoparticles may be integrated in creams with Derma Membrane Structure as the base substances of both of the systems are perfectly compatible. In this case, vitamin K<sub>1</sub> will form deposits in the horny layer and then evenly be released on a long-term base.

As the vitamin K certainly is resistant to atmospheric oxygen but sensitive to light the skin care products need to be protected. It is recommended to use light-proof dispensers and tubes as well as violet glass bottles.

## Supplement to the publication:

Vitamin K is vital for the human body. It belongs to the lipid-soluble vitamins and is found in two natural forms, viz. Vitamin K<sub>1</sub> and vitamin K<sub>2</sub>. Vitamin K<sub>1</sub> is mainly absorbed through vegetable food while vitamin K<sub>2</sub> is formed by intestinal bacteria like Escherichia coli. Hence, vitamin K deficiency may be observed in case of a disordered intestinal

flora after the treatment with antibiotics or in new-born babies where the intestinal flora has not yet been developed. The vitamin K absorption in the intestinal tract requires cholic acids. Thus, a disordered cholerrhagia may also involve a vitamin K deficiency. Vitamin K is found in green salads, sauerkraut, broccoli, spinach, but also in poultry meat. Food lipids support the vitamin K absorption in the gastroenteric tract.

Although Vitamin K<sub>1</sub> (phylloquinone; 2-Methyl-3-phytyl-1.4-naphthoquinone; INCI: phytonadione) and Vitamin K<sub>2</sub> (menaquinone; 2-Methyl-3-difarnesyl-1.4-naphthoquinone) have different structures, in the human body they both provide the same functions. In contrast to the vitamins K<sub>1</sub> and K<sub>2</sub>, the synthetic vitamin K<sub>3</sub> (menadione; 2-Methyl-1,4-naphthoquinone; INCI: menadione) is absorbed from the small bowel and colon even without any cholic acids. Only by integrating a hydrocarbon chain in position 3 of the molecule (cf Vitamin K<sub>1</sub> and K<sub>2</sub>) it will develop its characteristic vitamin features in the body. Vitamin K is a coagulation factor and among other tasks it provides for steady flow properties of the blood. A vitamin K deficiency delays the coagulation process and may aggravate the bleeding after injuries. Also the susceptibility to bruises (haematomes) or purpura as the efflorescence-like bleedings in the skin are called, nosebleeds and also bleeding in the gastroenteric tract or mucous membrane may be caused by a vitamin K deficiency.

Dr. Hans Lautenschläger