Children´s **VitaminD3**

Code: FE2132 – 15 ml

Children´s Vitamin D_3 contains the biologically active form of vitamin D (cholecalciferol), which is synthesised in the skin in response to sun exposure. Vitamin D contributes to normal absorption/utilisation of calcium and phosphorus, and to normal blood calcium levels. It contributes to the maintenance of normal bones, muscle function, and teeth, as well as to the normal function of the immune system. Vitamin D is needed for normal growth and development of bone in children.
Adequate levels of vitamin D_3 are crucial from childhood to adolescence. Despite the fact that we spend more time indoors than performing activities outdoors in nature, vitamin D_3 deficiency is often overlooked. Due to its negative impact on the development of children, the immune response and mood, Vitamin D_3 deficiency can contribute to a number of health problems. Lack of sunlight during the winter months and the use of sunscreen in summer mean that in many cases, vitamin D supplementation should even be recommended all year round.

Ingredients: Medium-chain triglycerides, cholecalciferol (Vitamin D_3).

Nutritional information:	**1 drop (0,03 ml)**
Vitamin D_3 (400 IU)	10 µg (200%*)

*NRV: Nutrient Reference Value in %

One bottle contains approx. 500 drops.

Contains no: Sugar, sweeteners, artificial flavour or colour, soy, yeast, corn, salt, wheat, eggs, or fish.

Size and format: 15 ml

Recommended daily dose:
Shake well. Children (0-13 years) and adolescents (14+): 1 drop daily. Put drop under the tongue, in cool drink, or cold food.

Do not exceed the stated recommended daily dose.

Indications and uses:
Maintenance of bone development and maintenance of healthy bones, muscle function, nails and teeth.
Prevention of lack of vitamin D which may contribute to bone diseases.
Contributes to normal immune function
Can be helpful in respiratory infections, asthma.
Supports maintenance of healthy brain function and mental health.

Vitamin D is also known as the "sunshine vitamin", since the body can synthesize it on its own after sun exposure. 10 to 15 minutes of sun exposure per week normally suffice for the body to produce the necessary amounts of vitamin D. However, many people even in sunny climates fail to produce enough vitamin D and require supplementation either via the diet or via nutritional supplements. The reason why vitamin D production in the skin is often inadequate is partly due to the increasing use of sun protection. Wearing sunscreen with a sun protection factor (SPF) of 15 thus reduces vitamin D synthesis in the skin by approximately 99%. Those with darker skin tones require more sun to produce the same amount of vitamin D than people with lighter skin pigmentation. A link has also been found between obesity and vitamin D deficiency, which is probably due to reduced bioavailability.

Vitamin D_2 is converted in the liver to 25-hydroxyvitamin D_2 (abbreviated 25[OH]D2), the most important circulating metabolite of vitamin D. It is then converted into its active form, 1,25-dihydroxy vitamin D (1,25[OH]2 D) in the kidneys. Since it regulates calcium metabolism, 1,25[OH]2 D plays a central role in bone and muscle health. Vitamin D deficiency reduces calcium absorption in the gut by more than 50%. Decreased concentrations of serum calcium stimulate the secretion of parathyroid hormone (PTH) to correct developing hypocalcaemia as soon as possible by mobilising calcium from bone.

Hypovitaminosis D (vitamin D deficiency) is therefore common. Note that vitamin D deficiency is present in approximately 50% of adults, adolescents and children who appear to be completely healthy. Various epidemiological studies also confirm that low levels of serum vitamin D are associated with a higher risk of chronic diseases such as diabetes, cardiovascular disease, breast, prostate and colorectal cancer, some autoimmune diseases, and rickets in children [1,3].

Vitamin D has been found to be involved in the immune system, in that it modulates the adaptive immune response and improves the innate immune response, which is why it also plays an important role in infections. Vitamin D induces the differentiation of monocytes into macrophages, stimulates phagocytosis, increases the production of lysosomal enzymes and interleukin 10 (IL-10), and reduces the production of interleukin 2 (IL-2).

The significant influence of vitamin D_3 on immune system performance becomes clear when viewed in the context of a deficiency. Children and adolescents who are deficient in this essential vitamin are more susceptible to diseases and infections. Vitamin D receptors are also present in brain cells, so that vitamin D_3 also plays a decisive role in maintaining healthy brain function and mental health.

In clinical trials, vitamin D_3 supplementation in children has been associated with promising results in various diseases from irritable bowel syndrome (IBS) to respiratory infections and even pneumonia [(4)]. According to a meta-analysis, administration of vitamin D_3 in addition to standard treatment may help prevent severe asthma attacks in asthmatic children and adults alike [(2)]. Further, the University of California in San Francisco has conducted studies on the effects of liquid vitamin D_3 on the main symptoms of autism, noting a link between low blood level of the vitamin and insufficient serotonin production. This has already been associated with symptoms of autism.

Children´s Vitamin D_3 provides long-term benefits by supporting the development of a healthy skeletal system in children. Further, more short-term effects have been identified in terms of a stronger immune system and better mental health.

At a concentration of 400 IU (International Units) per drop, the dosage can be easily adjusted to individual requirements. Administration is simple and convenient, and the neutral taste of the drops allows their intake either undiluted or stirred into cold drinks, cereal, fruit or yoghurt.

Essential for the development of healthy bones, teeth and nails in children.
Promotes a healthy immune response.
Helps achieve adequate levels of vitamin D for optimal health.

References:
1) Holick, M. F., Binkley, N. C., Bischoff-Ferrari, H. A., Gordon, C. M., Hanley, D. A., Heaney, R. P., ... & Weaver, C. M. (2011). Evaluation, treatment, and prevention of vitamin D deficiency: an Endocrine Society clinical practice guideline. *The Journal of Clinical Endocrinology & Metabolism*, *96*(7), 1911-1930.
2) Martineau AR, Cates CJ, Urashima M, Jensen M, Griffiths AP, Nurmatov U, Sheikh A, Griffiths CJ. . 2016. Vitamin D for the management of asthma. *Cochrane Database of Systematic Reviews, Issue 9*. Art. No.: CD011511. DOI: 10.1002/14651858.CD011511.pub2.
3) Ward, L. M., Gaboury, I., Ladhani, M., & Zlotkin, S. (2007). Vitamin D–deficiency rickets among children in Canada. *Canadian Medical Association Journal*, *177*(2), 161-166.
4) Urashima, M., Segawa, T., Okazaki, M., Kurihara, M., Wada, Y., & Ida, H. (2010). Randomized trial of vitamin D supplementation to prevent seasonal influenza A in schoolchildren. *The American journal of clinical nutrition*, *91*(5), 1255-1260.