EMULSI-D3 SYNERGY™

PLEASANT TASTING, NATURALLY EMULSIFIED LIQUID VITAMIN D3 WITH VITAMINS K1 AND K2

59 ML LIQUID | NPN80073152 | EMDK2Z-CN

Emulsi-D3 Synergy™ is a concentrated, highly bioavailable liquid vitamin D formulation offering 1,000 IU per 0.5 ml serving with 125 mcg of vitamin K1 and 12.5 mcg of vitamin K2. This is a convenient, pleasant tasting and easily mixed formula.

A natural emulsion technology allows for the production of this formula that quickly and completely disperses in liquid. This cutting-edge technology provides enhanced bioavailability utilizing only naturally derived ingredients that are free of preservatives and synthetic surfactants.

It is widely known that vitamin D deficiency has reached epidemic proportions and that it can manifest itself in a myriad of different ways that impact health. In addition, a large proportion of the US population is very deficient in vitamin K intake, emphasizing the importance of adequate supplementation of this critical vitamin.

EMULSI-D3 SYNERGY™ MAY BE BENEFICIAL FOR:

- Heart health
- Immune support
- Osteoporosis/Osteopenia
- Healthy teeth
- Mood disorders
- Long-term vitamin D supplementation
- Children, the elderly, and anyone who has difficulty swallowing pills

WHY INCLUDE VITAMIN K?

Vitamin K was included in this formulation because it is needed to work in synergy with vitamin D, as both vitamins D and K are essential for optimal bone and arterial health and for maintaining proper immune function. Vitamin K helps keep the important bone protein, osteocalcin, carboxylated. Undercarboxylated osteocalcin cannot regulate calcium, causing it to freely circulate in the bloodstream, and potentially be deposited in the soft tissues (calcification) such as arterial walls or kidneys.

An osteopenia study supplying K1 and D3 concluded, "Vitamin K supplementation stimulates renal calcium reabsorption, increases maturation-related cancellous bone gain, and retards the reduction in maturation-related cortical bone gain, whereas vitamin D supplementation stimulates intestinal calcium absorption and prevents the reduction in maturation-related periosteal bone gain by inducing accumulation of calcium from cancellous and endocortical bone." (*Iwamoto J, et al, Bone, 2003*)

In a study on postmenopausal women given a vitamin D supplement with minerals, these subjects showed a worsening of the elasticity of the arteries. In the other group given vitamin D with K and minerals, artery elasticity remained stable. (*Braam LA, et al, Thromb Haemost. 2004*) This is due to their interaction in the use of MGP, Matrix Gla Protein, which is a strong inhibitor of arterial calcification. The expression of MGP is D dependent and the gamma-carboxylation step which makes it active is K dependent.

Another study out of Wake Forest University, states, "hyperlipidemia, vitamin D, nicotine, and warfarin, alone or in various combinations, produce arterial calcification in animal models. MGP has recently been discovered to be an inhibitor of bone morphogenetic protein-2, the principal osteogenic growth factor.

Many of the forces that induce arterial calcification may act by disrupting the essential post-translational modification of MGP, allowing BMP-2 to induce mineralization. MGP requires gamma-carboxylation before it is functional, and this process uses vitamin K as an essential cofactor. Vitamin K deficiency, drugs that act as vitamin K antagonists, and oxidant stress are forces that could prevent the formation of Gla residues on MGP." (*Wallin R, eta al, Med Res Rev. 2001*) So, do not think of just vitamin D for the bones; vitamin K is also necessary for directing the transport of calcium into bone and teeth for optimal strength.

This relationship is so important and so complimentary that Designs for Health does not recommend high dosing of vitamin D in any situation where vitamin K intake is being restricted or in cases of vitamin K deficiency unless vitamin K accompanies the vitamin D. A recent review by Dr. Parris Kidd states, "Vitamin K compounds undergo oxidation-reduction cycling within the endoplasmic reticulum membrane, donating electrons to activate specific proteins via enzymatic gamma-carboxylation of glutamate groups before being enzymatically re-reduced. Warfarin inhibits this vitamin K reduction, necessitating K supplementation during anticoagulation therapy.

Along with coagulation factors (II, VII, IX, X, and prothrombin), protein C and protein S, osteocalcin (OC), matrix Gla protein (MGP), periostin, Gas6, and other vitamin K-dependent (VKD) proteins support calcium homeostasis, facilitate bone mineralization, inhibit vessel wall calcification, support endothelial integrity, are involved in cell growth control and tissue renewal, and have numerous other effects. This review updates vitamin D and K skeletal and cardiovascular benefits and evidence for their synergy of action." (*Kidd, PM, Altern Med Rev, 2010*)

COMBINING VITAMINS K1 AND K2

Although they originate from different sources, both vitamin K1 and K2 are important to our health. Vitamin K1 is the naturally occurring form of vitamin K in vegetables while vitamin K2 as MK-7 is a product of fermentation. Even though vitamin K is a fat-soluble vitamin, the plasma half-life of K1 is relatively short (around 2-8 hours), and its effects on activating important proteins in the body may only be maximal for about 8-12 hours after supplementation.7 However, vitamin K2 (MK-7) has a very long plasma half-life which gives it the special property of metabolizing slowly throughout the day, allowing the body the maximum time to reap its benefits. Thus, the inclusion of K1 along with the highly bioavailable K2 (MK-7) provides a comprehensive scope of vitamin K to complement the vitamin D in this product.

Medicinal Ingredients (per 0.5 ml):

Vitamin D (Cholecalciferol).....1000 IU
Vitamin K.....137.5 mcg
Vitamin K1 Phytonadione 125 mcg
Vitamin K2 Menaquinone-7 12.5 mcg

Non-Medicinal Ingredients: Vegetable glycerine, deionized water, vitamin E, medium chain triglycerides, olive oil.
Recommended Dose: Adults: Take 0.5 ml per day, or as directed by your health care practitioner. Emulsi-D3 Synergy™ can be dropped into any beverage or simply on the tongue. The convenient dropper makes dosing very simple and accurate, offering a broad range of dosages and titration possibilities.

REFERENCES

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