PROTOCOL FOR LIFE BALANCE®

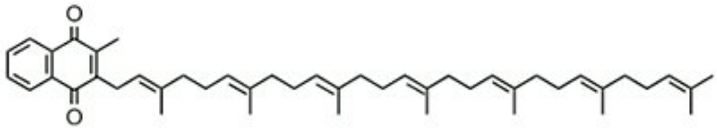
Dietary Supplement Information
for Physicians with Naturokinetics®
PRODUCT CODE: P0994
CATEGORY: VITAMINS A, D, E & K

MK-7 Vitamin K_2 Extra Strength

TECHNICAL SUMMARY

Vitamin K is well known for its role in blood clotting. It has also been found to play an important role in normal bone formation and the preservation of bone strength.* Vitamin K_2, more specifically, is a significant regulator of tissue calcification and is critical for the maintenance of arterial elasticity and cardiovascular health.* Vitamin K_2 includes two of the most studied subtypes, MK-7 (Menaquinone-7) and MK-4 (Menatetrenone). MK-7, the most readily absorbed and bioactive form of K_2, has no common dietary sources in the typical Western diet.* Unlike vitamin K_1, which is stored in the liver, MK-7 is transported directly to tissues and has a longer half-life than either K_1 or MK-4.*

Structure Formula:



Chemical Name: 2-methyl-3-farnesylgeranylgeranyl-1,4-naphthoquinone (menaquinone-7; MK-7)

Allergen and Additive Disclosure: Not manufactured with wheat, gluten, soy, milk, egg, fish, and shellfish. Produced in a GMP facility that processes other ingredients containing these allergens.

Delivery Form: Vegetable capsule.

ROLE AS NUTRIENT/FUNCTION

Vitamin K_2 is a generic term for a group of molecules of different sizes. This product has menaquinone-7, a purified form of vitamin K_2 with unique biological properties. Vitamin K is essential for the proper function (gamma-carboxylation of glutamyl amino acid residues) of GLA proteins in the body, including proteins involved in extracellular matrix mineralization such as osteocalcin in bones, and other matrix GLA proteins (MGP) found in cartilage and artery walls.* Clinical data suggest, for example, that MK-7 supplementation is able to induce prolonged carboxylation of osteocalcin and MGP in the blood. This effect on carboxylation is dose dependent as demonstrated in a 12-week, randomized, double-blind, placebo-controlled trial performed with 60 healthy volunteers receiving either a placebo, 180 or 360 mcg MK-7 daily where uncarboxylated dephospho-MGP decreased by 31% and 46% respectively in MK-7 supplementation groups and the ratio between uncarboxylated and carboxylated osteocalcin decreased by 60 % in the 180 mcg group and 74% in the 360 mcg group.*

NATUROKINETICS®

Liberation: Disintegration of the tablet is measured in water using a USP testing method with disintegration between zero to 60 minutes.

Absorption: Vitamin K_2 is a fat soluble vitamin. Following oral ingestion, MK-7 is rapidly absorbed in the intestine and enters blood circulation via the lymphatic system as part of the chylomicron fraction of plasma. Vitamin K_2 is most efficiently absorbed when consumed with foods containing fat. (Figure 1) In pharmacokinetic studies within the dose range

Supplement Facts

Serving Size 1 Veg Capsule

Amount Per Serving

Vitamin K_2 (as Menaquinone-7) (MK-7) (MenaQ7®) (from chickpea)	300 mcg**

** Daily Value not established.

Other ingredients: Microcrystalline Cellulose, Hypromellose (cellulose capsule), Silicon Dioxide and MCT (medium-chain triglycerides).

- **Supports Bone Health***
- **Supports Vascular Elasticity***

SUGGESTED USAGE: Take 1 capsule daily with a meal, or as directed by your healthcare practitioner.

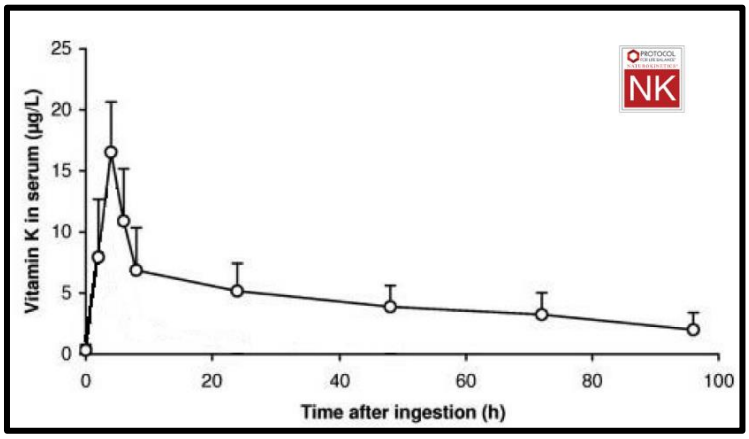


Figure 1. Circulating vitamin K concentrations following a single oral dose of 1 mg MK-7. Baseline level <0.05 mcg/L was subtracted from all values.

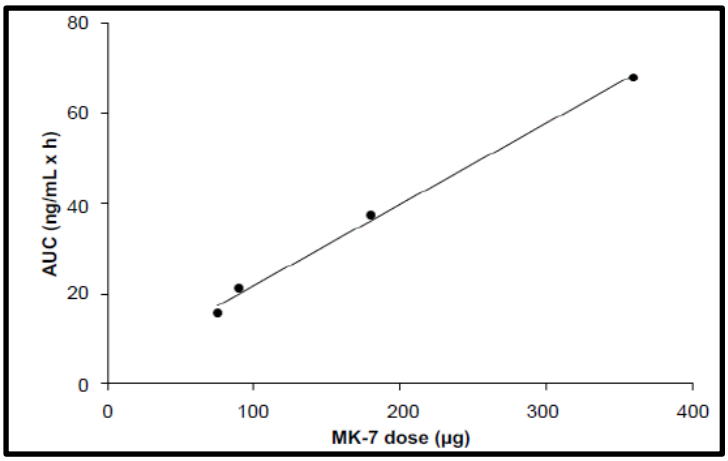


Figure 2: Dose-response relationship between MK-7 intake and 24h AUC circulating MK-7 values.

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

of 75- 360 mcg/day, a linear 24 h dose-response relationship was observed for MK-7 after the single-dose intakes. (Figure 2)

Distribution: MK-7 has a very long half-life. After oral ingestion it can be detected in the plasma for more than 48 hours and up to 92 hours. MK-7's distribution in tissues has not been yet fully elucidated; however, it is known to be present in the liver, pancreas, heart and bone lipids.

Metabolism: In the bloodstream, chylomicrons carrying vitamin K are metabolized into chylomicron remnants which are cleared by the liver. MK-7 metabolism in the liver is only partially known, it is most likely degraded through omega- and beta-oxidation and the obtained metabolites are then conjugated with glucuronic acid.

Elimination: The products of MK-7 metabolism are excreted in the bile and urine.

CLINICAL VALIDATION

- **Bone health support.*** In a prospective double-blind placebo-controlled clinical trial with 148 postmenopausal women, MK-7 supplementation (375 mcg/d or placebo for 1 year, both groups also received calcium and vitamin D) resulted in a significant slowing of age-related alteration of bone micro-architecture.* (Figure 3)

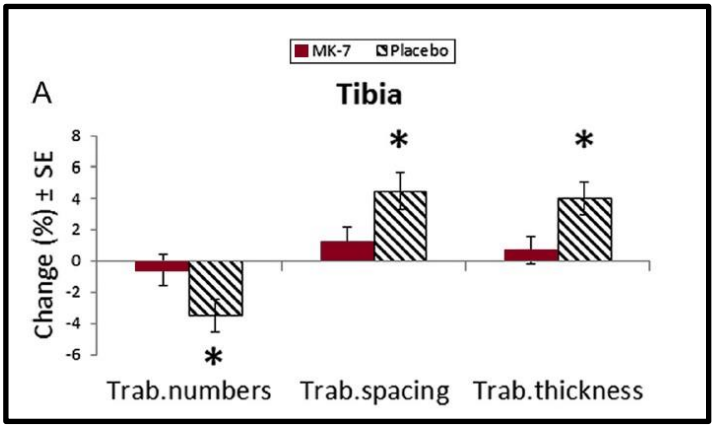


Figure 3: change in microarchitecture measured by high-resolution peripheral quantitative computed tomography from baseline to 12 months. Mean (%) change in trabecular numbers, trabecular spacing and trabecular thickness. *p<0.05 compared with placebo

- **Cardiovascular support.*** In a prospective double-blind placebo-controlled clinical trial with 244 healthy postmenopausal women, MK-7 supplementation (180 mcg/d or placebo for 3 years) resulted in a significant improvement in a marker of arterial stiffness.* (Figure 4)

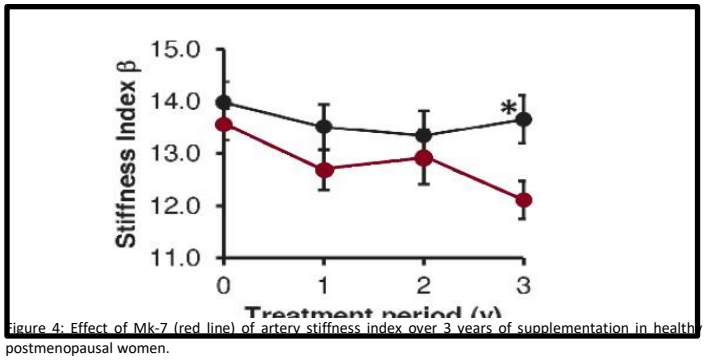


Figure 4: Effect of Mk-7 (red line) of artery stiffness index over 3 years of supplementation in healthy postmenopausal women.

SAFETY INFORMATION

Tolerability: MK-7 is well tolerated when used as directed. Occasional gastrointestinal complaints may occur.

Contraindications: Individuals receiving vitamin K antagonists (VKA).

INTERACTIONS

Drug Interactions: Possible interactions with cardiac glycosides, atorvastatin, thiazide diuretics, and anti-coagulant medication.

Supplement Interactions: CoQ_{10} and vitamin K_2 have similar chemical structures, concomitant use may theoretically have an additive effect.

Interaction with Lab Tests: Osteocalcin blood levels can be increased by vitamin K_2 supplementation.

STORAGE

Store in a cool, dry place in original sealed container.