MD Custom Rx
Quality Matters

# VITAMIN K2 180mcg

## CLINICAL APPLICATIONS

- Supports Healthy Blood Circulation
- Promotes Optimal Bone Health and Proper Calcium Storage
- Supports Cardiovascular Health and Arterial Elasticity
- Boosts Immune Function

**Emerging research highlights the importance of optimal intake of vitamin K and its critical role in maintaining bone and cardiovascular health. Composed of a group of naturally occurring and structurally similar, fat-soluble vitamins, vitamin K is required for the proper utilization of calcium and helps to bind newly absorbed calcium to the bone matrix. Vitamin K helps maintain bone mineral density by decreasing the activity of osteoclasts, cells which break down bone.[1] It also provides critical cardiovascular protection by activating matrix Gla protein (MGP), a potent inhibitor of circulatory calcification.[2, 3] Current research has found high concentration supplementation, at 180 µg/day, results in improved clinical results compared to lower-dose supplementation.[4] Vitamin K2 180 mcg provides an optimal dose of soy-free vitamin K2 delivered in the MK-7 form for optimal support of bone, cardiovascular and immune health.**

## Overview

Calcium and vitamin D are important mediators in bone growth, but vitamin K plays an equally important role. The synthesis of bone growth is dependent on vitamin K, through its carboxylation of osteocalcin, a protein secreted by osteoblasts.[5] Osteocalcin guides calcium into bones and prevents its absorption into organs, joint spaces and arteries. Vitamin K occurs in two forms: K1 (phylloquinone), found primarily in the liver, naturally occurs in green leafy vegetables and is considered to be the main dietary source and K2 (menaquinone),[6] which is a group name for a family of related compounds differentiated by their side chains.[7] MK-4 and MK-7 are the two subclasses of K2 most widely studied for their role in bone and cardiovascular health. The MK-7 form is substantially more active, has a longer half-life and accumulates to higher concentrations in serum than vitamin K1 and MK-4.[4,8] The different degrees of bioavailability between MK-4 and MK-7 are due to differences in structure. The long side-chain of MK-7 allows it to bind with fat particles in circulation. This process then allows easier facilitation to soft tissue, bones and arteries. More recently, research has shown that doses of 180 mcg of MK-7 provide greater results when supporting both bone and cardiovascular health.[4]

The addition of MenaQ7® PRO to this formula is backed by extensive research. Dr. Leon Schurgers, world-renowned expert in vitamin K2 as MK-7 research for cardiovascular and bone health, and his team of research scientists have conducted over 15 clinical trials on MenaQ7® PRO through the University of Maastricht.

## Vitamin K Depletion†

Although most people consume adequate dietary levels/amounts of vitamin K to maintain sufficient blood clotting, most do not consume enough MK-7 to meet cardiovascular and bone health needs. Compromised intestinal absorption can also lead to insufficient K2 levels, leaving calcium available to be exported out of bone and into other tissues. Other medications such as antibiotics, cholesterol-lowering medications and laxatives have also been found to contribute to a vitamin K deficiency.[9, 10]

## Bone Health†

Supplementation of K2 has repeatedly been shown to help maintain bone density and strength among women.[11] Research from Japanese populations has found superior bone health among women who more frequently consumed MK-7 rich nattō than those who did not.[12] The positive effect of K2

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on bone health is also evident among healthy children, among whom modest supplementation with MK-7 has been shown to increase osteocalcin carboxylation.[8] In a randomized, placebo-controlled trial, 180 mcg of MK-7 or placebo were given to 244 healthy post-menopausal women over the course of three years. After at least two years, statistically significant benefits were seen in vertebrae, hip and femoral neck.[13] Another ground-breaking randomized, placebo-controlled trial gave 244 women, aged 55-65, 180 mcg of vitamin K2 or placebo. The study found that those given the K2 were significantly better able to maintain their osteoclast to osteoblast ratio. Furthermore, levels of circulating osteocalcin, a marker related to tissue calcification in the body, were reduced by 50% among women taking K2 versus a 4% *increase* among the placebo group after two and three years.[4]

## Cardiovascular Health and Blood Sugar Balance†

Vitamin K also plays a key role in supporting the cardiovascular system and healthy blood sugar balance. In a large population study, those who consumed high amounts of K2 had significantly improved cardiovascular markers compared to those given vitamin K1.[14] A cohort of over 16,000 women also linked higher intake of K2 with better maintenance of cardiovascular health.[15] Studies have also shown vitamin K to support healthy blood sugar metabolism.[16, 17] Doses of 180 mcg of K2 have been shown to have a positive effect on arterial and vascular elasticity. Additionally, 180 mcg of K2 given over two to three years has been shown to help maintain soft tissue health and vascular elasticity in healthy adult subjects.[17] The same amount of MK-7 was also found to impart substantial benefits in arterial plasticity and blood vessel elasticity in healthy women, which had previously been only with "pharmacological doses" of synthetic vitamin K of up to 4,500 mcg daily.[13]

## Triage Theory†

The Triage Theory states that in the face of nutrient inadequacies, nature ensures short term survival of a cell is protected at the expense of long term consequences.[19,20] Vitamin K is an excellent example of this theory. Hypothetically, a short-term deficiency in vitamin K would lead to a reduction in blood clotting. This direct threat to survival does not happen, as the body uses its metabolic reserve of vitamin K to ensure immediate needs are met. If continued, this dip into reserve leads to a long-term deficiency in vitamin K. Though not directly threatening immediate survival, long-term deficiencies are linked to bone fragility, arterial calcification and genomic instability. These issues are related to a loss of vitamin K-dependent proteins not required for short-term survival, nevertheless presenting long–term health challenges.[19]

## Directions

1 capsule per day or as recommended by your health care professional.

## Does Not Contain

Gluten, corn, yeast, artificial colors or flavors.

## Cautions

If you are pregnant or nursing, consult your health care professional before consuming this product.

All forms of vitamin K may interact with blood thinning medications. If you are taking such medicines, please consult your physician before taking this product.

**Supplement Facts** V2

Serving Size 1 Capsule
Servings Per Container 60

| | Amount Per Serving | % Daily Value |
|---|---|---|
| Vitamin K2 (as Menaquinone-7 (MK-7)) (MenaQ7®PRO) | 180 mcg | * |

* Daily Value not established.

MenaQ7 PRO
Vitamin K2 as MK-7

**MenaQ7® PRO** is a registered trademark of NattoPharma, Norway.

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