

Vitamin K supplementation

Vitamin K is a fat-soluble vitamin that plays an important role in the functioning of various proteins within the body. These proteins are involved in essential activities including blood clotting, bone growth, and cardiovascular health. Most North Americans consume adequate vitamin K; however, individuals at risk for certain conditions, such as cardiovascular disease and osteoporosis, may benefit from consuming more of this nutrient.

Types of vitamin K

Vitamin K has two main types: K1 and K2. Vitamin K2 is mainly produced by bacterial fermentation, making fermented foods, such as blue cheese and sauerkraut, good dietary sources. Vitamin K1, however, is a product of photosynthesis and can be found in many foods, particularly green leafy vegetables.

Vitamin K1, also known as phyloquinone, is a single compound, while vitamin K2 includes several compounds called menaquinones (MKs). MKs are often classified individually as MK-4 through MK-13, according to their molecular structure. Compared to other forms, MK-4, MK-7, MK-8, MK-9, and MK-10 are the main types of vitamin K2 consumed in the human diet. However, MK-4, MK-7, and MK-9 are the main menaquinones used in research. Up to 90% of dietary vitamin K is K1, but research suggests that consuming more vitamin K2 may provide benefits beyond its essential functions.



Type of vitamin K	Main functions	Dietary sources
Vitamin K1, phylloquinone	Blood clotting	Green leafy vegetables, plant oils
Vitamin K2, menaquinone-4 (MK-4)	Bone density, calcium transport	Animal foods (e.g., eggs, lard, meat, fish)
Vitamin K2, menaquinone-7 (MK-7)	Bone density, calcium transport	Fermented foods (e.g., kefir, natto, sauerkraut)
Vitamin K2, menaquinone-9 (MK-9)	Bone density, calcium transport	Fermented cheese (e.g., gouda, swiss)

Health benefits of vitamin K

Historically, it was believed that vitamin K was solely involved in blood clotting; however, current evidence suggests that vitamin K-dependent proteins are involved in a variety of metabolic processes, including:

- Bone development
- Brain function
- Blood coagulation (clotting)
- Calcium transport
- Liver function
- Kidney function
- Pancreatic function

In addition to its various functions, vitamin K may also exert antioxidant and anti-inflammatory effects. Research indicates that vitamin K, especially K2, may be useful for certain chronic diseases. A regular intake of vitamin K2 is associated with a variety of health-promoting benefits, including:

- Cardioprotection
- Improved bone strength
- Improved insulin sensitivity

Individuals with (or at risk for) the following conditions may particularly benefit from consuming adequate vitamin K:

- Cardiovascular disease
- Chronic kidney disease
- Liver cancer
- Liver disease
- Osteoporosis
- Type 2 diabetes

Vitamin K in the body

Vitamin K is absorbed in the intestines and transported throughout the body. As a fat soluble vitamin, vitamin K is mainly stored in the liver and fatty tissues. Consuming vitamin K with a [healthy fat](#) source, such as avocado, may help improve its absorption. Vitamin K1 and MK-7 appear to be the best-absorbed forms of vitamin K.

Special considerations

Most individuals meet daily vitamin K recommendations from dietary K1, and dangerous levels of vitamin K deficiency are not typically observed in North America. However, some people may still benefit from increased vitamin K intake.

Gastrointestinal conditions such as cystic fibrosis, ulcerative colitis, and short bowel syndrome can cause malabsorption, which may lead to low vitamin K levels. As a result, a high vitamin K diet or vitamin K supplements may be necessary to reach nutritional goals.

The following populations may also have increased vitamin K needs. If you think you may need to consume more vitamin K, consult with your integrative healthcare practitioner.

Infants

Infants commonly develop vitamin K deficiency within the first few weeks of life. A combination of factors may contribute to low levels of vitamin K in newborns including liver immaturity and low vitamin K content in breast milk. Worldwide, infants receive a shot of vitamin K1 at birth in order to prevent vitamin K deficiency-related bleeding, which can be fatal.

Children

Osteocalcin, a vitamin K-dependent bone growth protein, is one of the most abundant proteins in the human body. During childhood, this protein reaches peak levels in order to strengthen bones. To support this, vitamin K recommendations for children are higher than those for adults.

Elderly

The risk of developing health complications, such as cardiovascular disease and osteoarthritis, increases with age. Oftentimes, in order to reduce the risk of health complications, aging individuals require higher nutrient levels. However, aging individuals also often eat less food than adults and are less capable of absorbing nutrients in the gastrointestinal tract. Trends indicate that vitamin K intake declines with age, with only one-third of males over 70 years old meeting recommendations. Increasing vitamin K intake may be of particular importance in older individuals.

Potential adverse effects

Most studies using vitamin K supplements report no serious adverse effects; however, some individuals indicate experiencing gastrointestinal side effects. Vitamin K may have serious interactions with certain medications, so it's important to communicate with your healthcare provider before adding vitamin K supplements to your regimen or making changes to your diet. The following medications may impact vitamin K status and lead to health complications:

- Antibiotics
- Anticoagulants (i.e., warfarin, Coumadin)
- Bile acid sequestrants (i.e., cholestyramine, colestipol)
- Orlistat

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