Vitamin K

Vitamin K is a fat-soluble vitamin that is required for modification of proteins needed for blood clotting. Vitamin K also is important for bone mineralization, cell growth, and metabolism of blood vessel walls. There are three forms of vitamin K: vitamin K_1 or phylloquinone, vitamin K2 or menaquinone, and vitamin K3 or menadionc. Phylloquinone is of plant origin and used mainly for blood clotting. Menaquinone is produced typically by probiotic bacteria in the large intestine, although it also is found in small amounts in meat, fish, and fermented food. Menaquinone is important in bone mineralization, cell growth, and metabolism of blood vessel walls.

Research on vitamin K and osteoarthritis has been emerging in the scientific literature. Shea et al. conducted a cross-sectional and longitudinal trial to examine the association between vitamin K status and knee osteoarthritis in older athletes. This was part of a large study entitled "Health, Aging and Body Composition Study" (Health ABC Study). They measured plasma concentrations of phylloquinone (vitamin K_1) and took magnetic resonance imaging (MRI) of the bilateral knees in 791 older community-dwelling adults (74 ± 3 years of age; 67% were women). They reported that those individuals with low plasma phylloquinone concentrations had a greater progression of articular cartilage and meniscus damage in their knee joint. More research is required to assess if vitamin K status is related directly to knee osteoarthritis. In particular, randomized controlled trials are needed to assess if vitamin K supplementation will improve or possibly prevent knee osteoarthritis.

Vitamin K supplementation has not been shown to improve athletic performance; however, researchers have evaluated vitamin K status in athletes on bone and physical function. Sumida et al. examined 16 collegiate athletes who suffered from sports-related fractures. They also examined bone mass, bone turnover, nutritional status, and physical function in all of these athletes. With respect to nutritional status and, in particular, vitamin K intake, they reported that 15 of 16 athletes had a lower than required vitamin K intake, as well as low intakes of calcium (all athletes) and vitamin D (12 athletes). These lower intakes of important micronutrients related to bone may have led to the increased fracture risk and higher bone turnover the researchers reported in these athletes.

Although more research needs to be conducted in larger populations, evaluating the effects of vitamin K supplementation on knee osteoarthritis as well as bone turnover in various athletes, it makes sense to make sure you are getting enough with our nutrition program. The Dietary Reference Intakes for vitamin K have been established as Adequate Intakes. Females and males aged 9 to 13 years require 60 ug per day of vitamin K, whereas females and males aged 14 to 18 years require 75 ug/d of vitamin K. Women aged 19 to older than 70 years, as well as pregnant and lactating women, require 90 ug/d of vitamin K. Finally, men aged 19 to older than 70 years require 120 ug/d of vitamin K.

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