

About Vitamin K2



WHAT IS VITAMIN K2

Vitamin K is not a single compound – it consists of a group of essential fat-soluble vitamins. The vitamin K family is divided into vitamin K1 – one molecule (phylloquinone) – and vitamin K2 – a group of molecules (menaquinones). Vitamin K2 exists in several forms, the most common ones are the synthetic menaquinone-4 (MK-4) and the natural or synthetic menaquinone-7 (MK-7).

All K vitamins share a “quinone” ring. However, they differ in the saturation and number of attached carbon-hydrogen atoms in the sidechain, called “isoprenoid residues.” These differences are especially pronounced in the vitamin K2 group, which includes menaquinones with different lengths of the side chain. The length is marked in the name of the particular menaquinone chain (ex: MK-4 means 4 isoprenoid residues are attached to the main ring), and the length influences their abilities to reach different tissues within the body. In other words, the longer the side chain, the better it is absorbed and longer it remains in the blood.

WHAT VITAMIN K2 DOES

There are many proteins in the body responsible for processes that keep systems healthy, but these proteins need to be activated, which is where vitamin K2 comes into play. The largest body of research has focused on vitamin K2’s beneficial influence on bone and cardiovascular health based on the activation of specific K-dependent proteins.

- Bone health: vitamin K2 activates a protein called osteocalcin, which works to moderate a healthy bone turnover process, ensuring that as much bone is built to replace the bone that is broken down.
- Cardiovascular health: vitamin K2 activates Matrix Gla protein (MGP), which helps keep cardiovascular arteries pliable and healthy by discouraging calcium from adhering to arterial walls, calcifying (or hardening) them.

Vitamin K2 has been shown to activate 15 other inert proteins. There are numerous studies planned and under way to demonstrate the precise manner in which K2 activates these proteins, and the specific benefit on human health.



SOURCES OF VITAMIN K2

Vitamin K2 is predominantly of microbial origin. Vitamin K2 is primarily found in animal products, such as meat, dairy, and eggs, and fermented foods like hard-rind cheese, yogurt, and natto, a Japanese traditional dish of fermented soybeans. Eating more vitamin K2-containing foods is encouraged as part of a healthy diet, but supplementation is an alternative to fill vitamin-K2 gaps.

WHO CAN BENEFIT VITAMIN K2

Every segment of the population can benefit from adequate vitamin K2 intakes. Using bone health as an example, according to the World Health Organization (WHO), poor bone metabolism is a condition that affects some 200 million people globally:

- One in three **men** are expected to incur bone fractures in the future.
- Lifetime risk of fracture for **women** is nearly one in two, as they are more vulnerable due to 1) having less bone mass than men, and 2) the annual bone mass in women accelerates after menopause.
- As young bones are highly active and osteocalcin levels are eight to 10 times higher compared to adult bones, the requirement of vitamin K2 is also higher for **children**.

