



---

## **New Human Study Shows Vitamin K2 Superior to Vitamin K1**

2007/04/16 - Cardiovascular Research Institute Maastricht (CARIM)

---

WASHINGTON -- April 16, 2007 -- A new study published in the April 15, 2007 (volume 109, number 8) issue of *Blood*, the official journal of the American Society of Hematology, reveals greater benefits of vitamin K2 over K1 in promoting bone and cardiovascular health. The four-part human study demonstrated that vitamin K2 as menaquinone-7 (or "MK-7") was superior to vitamin K1 in several important areas, including better absorption, much longer bioavailability and higher efficacy levels in the body.

"This is the first human study using natural vitamin K2 as a dietary supplement. It shows that vitamin K2 as MK-7 is clearly the most beneficial and potent K-vitamin that one can take," said lead researcher Leon Schurgers, Ph.D. "Large scale human studies have shown that eating foods rich in vitamin K2 significantly promotes bone health, reduces risk of bone injury, and significantly promotes cardiovascular health."

Conducted by scientists at the Cardiovascular Research Institute (CARIM) and VitaK, Maastricht University, The Netherlands, the study demonstrated significant superiority of MK-7 over vitamin K1 in four different human models. The study showed that MK-7 was absorbed into human blood as quickly as K1, but with a 1.5 fold better absorption and also remained at potent levels for a significantly longer period of time. MK-7 also more effectively promoted and activated markers of bone building, and demonstrated a dramatic advantage over K1 in counteracting the vitamin K antagonist effect of the commonly prescribed blood thinning medication, warfarin. Warfarin has been shown to increase calcification in the arteries, a known independent risk factor for cardiovascular disease.

The benefits of vitamin K for cardiovascular disease are supported by the findings of a Dutch study called the "Rotterdam study" (Geleijnse et al) examining the benefits of dietary Vitamin K and its role in preventing Coronary Heart Disease (CHD) in 2004. This study involved over 4,800 people over a ten year period and revealed that increased dietary intake of vitamin K2 significantly reduced the risk of CHD mortality by 50% as compared to low dietary vitamin K2 intake. In that study, vitamin K1 had no effect at all.

The primary reason for MK-7's superiority appears to be its very long 3-day half-life in the blood, compared to the 1-2 hour half-life of K1, which results in more stable blood levels and significantly greater accumulation of vitamin K (MK7) in the blood. In addition, the study reveals MK-7 as having better blood coagulation cofactor activity and dramatically higher bioactivity.

Vitamin K is an essential micronutrient and necessary in our human diet to activate vitamin

K-dependent proteins involved in the utilization of calcium – both for building strong bones and inhibiting calcium accumulation in the arteries. Vitamin K is also necessary for producing blood coagulation. Accumulating scientific evidence suggests that optimal bone and vascular health requires a relatively high intake of vitamin K, especially K2, more than previously thought to be satisfactory in a typical healthy diet.

Until recently, vitamin K1 has been the main variety of the vitamin K family that has been used in commercial supplements and is the most common variety contained in food groups. Recent health claims in scientific literature related to natto (traditional Japanese food made from fermented soybeans) consumption has given rise to an increasing interest in MK-7, a natto extract, as a potential improvement over vitamin K1 in supplementing a healthy diet. Because of this interest, over-the-counter dietary supplements based on MK-7 have recently begun to appear on the market.

The four studies were as follows:

Study 1: 15 volunteers consumed vitamin K1 and blood was taken at regular intervals 2-96 hours after intake. After a washout period the same process was followed with an MK-7 supplement. While both blood levels peaked at about 4 hours, by 8 hours the levels of vitamin K1 were 86% reduced, showing quick excretion. MK-7, in contrast, declined very slowly with measurable levels at 96 hours, the last point of measure in the study.

Study 2: 10 volunteers were given increasing doses of both vitamin K1 and MK-7. Both forms of vitamin K were absorbed, though MK-7 was absorbed much better. At 24 hours, no effect was measured for vitamin K1 at the highest dose, while MK-7 was at the upper level of the normal value for vitamin K. Thus, only MK-7 gives 24 hour protection with one single dose.

Study 3: 18 volunteers took either vitamin K1 or MK-7 for 6 weeks in a cross over design. Blood levels were measured and MK-7 increased blood levels and reached a plateau after two weeks while K1 remained slightly above placebo levels. Markers of bone turnover were measured and while both forms of vitamin K showed activity after 3 days, K1's effect did not increase while MK-7's effect increased over the six-week period, resulting in a six-fold more potent role for MK-7 as compared to K1.

Study 4: 12 volunteers were given differing doses of a blood thinning drug to reach the same level of anti-clotting activity. This drug is a vitamin K-antagonist, and measuring the response to vitamin K supplementation is a measure of K's activity in the body. MK-7 was much more potent, demonstrating a superior bioactivity.

The study strongly suggests the benefits of MK-7 over vitamin K1. Attributed largely to its very long half-time time, MK-7 as a supplement may provide the best source of vitamin K in promoting bone and vascular health, as well as providing an improvement for use by patients receiving treatment for blood coagulation disorders.

# # #

For more information contact:

Terri Slater  
GBA Public Relations Inc.  
561-487-7037  
[tslater@gbaf.com](mailto:tslater@gbaf.com)

### About Cardiovascular Research Institute (CARIM) and VitaK, Maastricht University

Cardiovascular Research Institute Maastricht (CARIM) is the leading cardiovascular research institution of Maastricht University, The Netherlands. The three main areas of research within the institute are as follows: (1) thrombosis and hemostasis, (2) functioning of the normal and failing heart and (3) research on vascular biology of both large and small vessels. All three themes of research involve fundamental as well as clinical studies. The institute has expertise in a wide range of areas, ranging from molecular biology to population-based studies. Its goal is to focus on clinically important questions, integrating knowledge from molecule to patient.

VitaK, BV. is a wholly-owned company of the University of Maastricht, a research-company with a long expertise in all aspects of vitamin K and vitamin K-dependent proteins, including the detection of all forms of vitamin K in nutrients, tissue and serum as well as the detection of different conformations of the vitamin K-dependent proteins osteocalcin and matrix Gla-protein (MGP). It is a research company in which promising fundamental and applied research is performed, for example on osteoporosis prevention, vascular health and diagnostics.

---

*NPICenter.com*  
<http://www.npicenter.com/>