

Vitamin K's Place in a Healthy Lifestyle

At this time, the goal for average daily vitamin K intake is 90 micrograms for women and 120 micrograms for men. But only 27 percent of people in the United States consume that amount, according to a food consumption survey analysis from the Beltsville (Maryland) Human Nutrition Research Center (BHNRC), part of the Agricultural Research Service.

To provide the data for that analysis, researchers with the ARS-funded Vitamin K Laboratory determined the amounts of three major types of vitamin K in hundreds of foods. The laboratory is part of the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, in Boston, Massachusetts. Through a collaboration, those data are available via BHNRC's Nutrient Data Laboratory website. The collaboration is part of the National Food and Nutrient Analysis Program, described in the story on page 6 of this issue.

Sarah Booth, director of the Vitamin K Laboratory, and colleagues are also using new methods to assess individuals' vitamin K blood plasma concentrations—and associations between that status and chronic diseases. For example, they have reported that higher blood levels of phylloquinone—the main form of vitamin K—were associated with a lower risk of osteoarthritis (OA) in the hands and knees. OA involves the breakdown of cartilage and bones, which causes pain and stiffness.

“This study is particularly significant because low dietary intakes of vitamin K are known to be associated with bone loss in the elderly,” says Booth. The study appeared in the April 2006 issue of *Arthritis & Rheumatism*.

Vitamin K is also essential to blood clotting and cellular growth. Other research conducted by Booth and colleagues raises new questions about the role of inadequate vitamin K intake and the progression of arterial calcification, or hardening of the arteries.

Newly discovered vitamin K-dependent proteins, such as matrix gla protein, or MGP, are providing clues as to the mechanisms behind these associations. MGP requires vitamin K to function. It is a binding protein that has been shown by other researchers to play a key role in inhibiting calcification in cartilage and in arterial vessels.

“Vitamin K intake may be a marker of a healthy diet because it is found mainly in green, leafy vegetables and certain plant oils,” says Booth. “This could explain associations between low vitamin K intake and risk for heart disease.”

The laboratory's researchers recently completed a 3-year study in which 452 male and female volunteers, aged 60 to 80, were either supplemented with adequate vitamin K or given a placebo. The data is being analyzed to see whether there were changes in bone density or age-related vascular calcification in the participants who received the vitamin K.—By **Rosalie Marion Bliss**, ARS.



Nutritionists Kyla Shea (left) and Sarah Booth perform a DXA scan on a volunteer to measure bone mineral density as part of the vitamin K supplement study.

This research is part of Human Nutrition, an ARS national program (#107) described on the World Wide Web at www.nps.ars.usda.gov.

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