

The Vitamin No One Talks About

BY CAITLIN E. COX

VITAMIN K RESEARCH IS FAR FROM GLAMOROUS, BUT THE LITTLE-KNOWN VITAMIN MAY finally be getting the attention it deserves.

Since arriving at Tufts in 1992, researcher Sarah L. Booth has built a body of knowledge on vitamin K. Now she believes that vitamin K, a nutrient once thought only to affect blood clotting, may join vitamin D and calcium as another crucial weapon against the devastating impact of the brittle bone disease, osteoporosis.

Booth, director of the Vitamin K Research Program at the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA), outlined her approach to the vitamin K question in her lecture, "Vitamin K: From Greens to Recommendations," February 5 at the Friedman School's Nutrition Science and Policy seminar series.

What's good for chicks...

BOOTH, AN ASSISTANT PROFESSOR OF NUTRITION, BEGAN HER RESEARCH AT TUFTS BY gathering all the existing information on vitamin K, a nutrient first identified by Danish researchers in the 1930s, when they realized that feeding cabbage to chicks would stop uncontrolled bleeding. They named the previously unknown substance vitamin K for "koagulation."

"This, quite frankly, is a sobering fact," Booth says, "because it means 70 years ago, we knew that if you fed a chick a vegetable, you would prevent clotting disorders. So we haven't really come that much further in 70 years."

Over the next decade, Booth fleshed out vitamin K's profile by asking critical questions: How much vitamin K exists in common foods? How much vitamin K do Americans actually eat? What are the consequences of low vitamin K in otherwise healthy people? How should the government define vitamin K's recommended daily allowance? Even setting the ideal level of vitamin K intake was far from easy. Booth recalled the process as "a lesson in human effort."

Vitamin K has only one known function: It helps an enzyme convert the chemical structure of certain proteins to their mature form, thereby enabling the proteins to bind properly with calcium. For 40 years, scientists only knew of vitamin K's effect on blood coagulation, but they have now documented a total of 14 vitamin K-related proteins that influence blood coagulation, bone, the kidneys, cell death and atherosclerotic plaques.

How much is enough?

BOOTH HAS FOUND THAT VITAMIN K IS ABUNDANT IN GREENS, BUT NOT IN POTATOES and other root vegetables common in the American diet. Soybean, canola and olive oils also contain vitamin K. For years, standard medical textbooks said that the typical diet contained 300 to 500 micrograms of vitamin K per day, far above the current recommended intakes of 90 to 120 micrograms per day. But, as Booth points out, these estimates of vitamin K intake were calculated before 1994, when few numbers for the vitamin K content of food existed. Now she believes that many people, especially adults ages 18 to 44, may be getting far less vitamin K than they need, though she is unsure how this affects their overall health.



Cabbage is an excellent source of vitamin K.

Few Americans eat green vegetables daily, and vitamin K-rich hydrogenated oils, despite being abundant in the American food supply, provide a type of vitamin K less effectively absorbed by bones than the form contained in non-hydrogenated oils.

Over the past several years, Booth's work has strengthened the connection between vitamin K and bone loss. These conclusions have been based primarily on epidemiological studies, which sometimes make unreliable associations. In an uncontrolled environment, researchers have a hard time knowing whether poor bone health is caused by low amounts of vitamin K alone, or as a result of a combination of unhealthy behaviors.

To clarify vitamin K's impact, Booth is collaborating with HNRCA colleague Dr. Bess Dawson-Hughes on a three-year, double-blind, placebo-controlled trial to study the effects of vitamin K supplements on age-related bone loss and the growth of arterial calcium deposits in 450 men and women, ages 60 to 80.

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