

## Nutrients may prevent blinding disease

There's no guarantee of attaining Popeye's strength, but a diet rich in spinach and other vegetables can help prevent chronic diseases and keep the pounds off. A new study now shows that spinach and other green leafy vegetables may also help ward off an eye disease that ranks as the leading cause of irreversible blindness in people age 65 and older.

In this disorder, called age-related macular degeneration, the macula — the part of the retina at the back of the eye — becomes progressively damaged. As time goes on, victims lose all central vision. Physicians have no cure and no way to prevent it.

Researchers had speculated that certain nutrients in foods, particularly pigment molecules known as carotenoids, might protect against or slow the march of macular degeneration. Johanna M. Seddon of the Massachusetts Eye and Ear Infirmary in Boston and her colleagues decided to test that theory.

The team started its investigation with 356 men and women, age 55 to 80, already diagnosed with advanced macular degeneration. A control group of 520 men and women in the same age range suffered from some other form of eye disease. The researchers questioned the volunteers extensively about their diet. From that survey, the team calculated the amount of specific nutrients and vitamins that each recruit regularly consumed.

The scientists found that people getting the heaviest dose of carotenoids in their diet had a 43 percent lower risk of advanced macular degeneration than people ingesting the least carotenoids.

"The findings are pretty exciting," comments Susan E. Hankinson of Brigham and Women's Hospital in Boston. She calls that risk reduction "quite substantial." Both the study and an accompanying editorial by Hankinson appear in the Nov. 9 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

The carotenoids — a family of yellow, orange, and red pigments — are found in fruits and vegetables. Beta-carotene, the best known of the group, has been associated with a lower risk of cancer and heart disease.

However, when Seddon and her colleagues zeroed in on the specific carotenoids protecting the macula, they got a surprise: Beta-carotene wasn't the star of this story. Two other pigments, lutein and zeaxanthin, accounted for the risk reduction.

The beauty of that finding is that it makes biological sense, Hankinson says. Lutein and zeaxanthin form the yellow pigment in the macula of the eye. Researchers believe they may prevent damage to the eye by filtering out

visible blue light.

In a related report in the same issue of the journal, another research team studied the relationship between concentrations of all carotenoids in the blood and the risk of heart disease. Dexter L. Morris of the University of North Carolina School of Medicine in Chapel Hill and his colleagues found that people with very high concentrations of carotenoids had a decreased risk of heart disease.

Both studies underscore the fact that researchers still must sort out the complex interplay between certain nutrients and a given health benefit. While other

reports have suggested that carotenoids offer some heart protection, this is the first study to peg lutein and zeaxanthin as a shield against macular degeneration.

"It is important to recognize that these findings aren't conclusive," Hankinson says. "We really need additional confirmatory studies."

The jury remains out on whether multivitamin supplements protect against age-related diseases. However, Hankinson and other scientists do advise people to consume a diet rich in fresh fruits and vegetables. For those who want to boost their intake of lutein and zeaxanthin, spinach and collard greens contain lots of these carotenoids, Hankinson notes.

—K.A. Fackelmann

## Viking teeth recount sad Greenland tale

Although 500-year-old corpses can't describe their deaths, geochemists have found a way to pull vital clues directly from the mouths of ancient Norsemen whose colony in Greenland thrived for centuries before disappearing mysteriously in the late 1400s. Studies of oxygen locked within the enamel of the Viking teeth reveal that Greenland's once balmy climate turned frigid, sealing the colony's fate.

Henry C. Fricke of the University of Michigan in Ann Arbor and his colleagues are the first researchers to decipher information about past climates using isotopic evidence from human bodies. While geochemists often use oxygen isotopes to reconstruct conditions, they typically analyze oxygen from non-biological materials such as seafloor sediments, soils, or ancient ice.

"People are interested in humans and their relationship to climate change. If this technique works, it tells what kind of climate the humans lived under because the evidence comes directly from the humans," comments Paul Koch of Princeton University.

Fricke and his colleagues tried the technique because previous studies on modern animals had shown that tooth enamel records the ratio of oxygen-18 to oxygen-16 in precipitation consumed by the animals during their formative years. That isotopic ratio, in turn, indicates the local temperature.

Fricke and his coworkers looked at 29 teeth uncovered at three archeological sites in Greenland and one in Denmark. To test the technique, they documented that the isotopic ratios varied as expected with latitude. Next, the researchers looked at

how ratios changed over time in southern Greenland. By comparing teeth from the year 1100 with those from 1450, they found that mean annual temperatures dropped by about 1.5°C, which would have had significant effects, says Fricke. They reported their findings late last month at a meeting of the Geological Society of America in Seattle.

The tooth study corroborates other evidence linking climate to the demise of the Norsemen on Greenland. The colony had flourished during the first few centuries of this millennium, but a cooling in the 1300s and an increase in icebergs hampered shipping between Greenland and Iceland, ultimately cutting off contact with Greenland. Historians believe that the colder temperatures brought food and fuel shortages. When ships again reached Greenland in the late 1400s, no living colonists remained, says Fricke.

Climate may not have worked alone, however. As the region cooled, northern Inuit moved into the Europeans' territory. Anthropologists have wondered whether conflict with the Inuit helped extinguish the Norse colony.

—R. Monastersky



Ancient teeth with a lot to say.

Bob Kalmbach/University of Michigan