## Lutein-Containing Foods Can Help Prevent Colon Cancer

Carotenoids, substances found in many fruits and vegetables, have biological properties that offer protection against cancer.

A new study examined how specific carotenoids protect against particular types and stages of colon cancer. Of all the carotenoids tested, lutein had the greatest protective effect.

An inverse relationship between lutein intake and colon cancer was found for all subjects, meaning that the more lutein-containing foods that were consumed, the less of a risk of colon cancer. This was especially the case for those who were younger when their cancer was diagnosed.

Lutein is found in spinach, broccoli, lettuce, tomatoes, carrots, oranges and orange juice, celery, greens and eggs.

The study, led by Martha Slattery of the Health Research Center in Salt Lake City, Utah, looked at 1,993 subjects ages 30 to 79 years who had been diagnosed with colon cancer, and a control group of 2,410 people who did not have cancer. Participants were asked to report the foods they had eaten during a specific time period two years before or two years prior to their diagnosis. Nutrients contained in the foods were then calculated using a database.

Of all the carotenoids investigated, only lutein and zeaxathin showed a protective effect against colon cancer.

The antioxidant effect of lutein and zeaxathin is linked to their biochemical effectiveness as scavengers of oxygen radicals, as well as their reaction with cell membranes in the colon, which are susceptible to carcinogenesis.

The study was published in the February issue of American Journal of Clinical Nutrition.

The study participants were members of the Kaiser Permanente Medical Care Program of Northern California, in an eight-county area in Utah and in the Minneapolis-St. Paul area. Most subjects were interviewed within four months of diagnosis.

Carotenoids have long been recognized for their antioxidant properties and are increasingly being studied in relation to cancer because of their effect on regulation of cell growth, modulation of gene expression and, possibly, immune response, according to the study.

One expert said the study sends out a simple but important message.

"It's more support for eating your fruits and vegetables; that's the bottom line," said Colleen Doyle, a registered dietician and director of nutrition and physical activity at the American Cancer Society in Atlanta. "We've said for a long time that substances in fruits and vegetables are very protective against cancer, colon cancer especially, but we didn't know what it was specifically that was protective. This gives some indication that it's the carotenoids."

---

American Journal of Clinical Nutrition (2000;71:575-582)