

The results of a new large study indicate that women with higher plasma carotenoid levels have a reduced risk of breast cancer, and particularly the more aggressive tumors.

## Higher plasma levels of carotenoids may reduce breast cancer risk

Carotenoids are among the nutrients needed for plant photosynthesis. They are also the pigments in fruits and vegetables that provide the yellow, orange and red colors. Of over 600 known dietary carotenoids,  $\alpha$ -Carotene,  $\beta$ -carotene,  $\beta$ -cryptoxanthin, lutein, zeaxanthin, and lycopene are the most prevalent in the US diet, comprising 90% of circulating carotenoids. Current evidence suggests that carotenoids may reduce breast cancer risk, but at what stage they are most influential and in what tumor subtypes is less clear.

In a recent large study published online in the American Journal Clinical Nutrition, researchers examined the issues of timing of carotenoid exposure as well as associations by breast tumor subtypes.

The study group included 32,826 women that participated in the Nurses' Health study and donated blood samples in 1989-1990. In 2000-2002, 18,743 of these women donated a second blood sample. Women diagnosed with breast cancer between first and second blood collection, and those diagnosed with breast cancer within ten years of the second collection, were matched with control subjects.

After adjusting for several breast cancer risk factors, significant inverse associations were observed between  $\alpha$ -carotene,  $\beta$ -carotene, lycopene, and total carotenoids and breast cancer risk with an overall 18–28% lower risk in the women with the highest blood levels compared to women with the lowest levels. The protective benefits of  $\beta$ -carotene and total carotenoids were more pronounced in leaner women (BMI < 30). In addition,  $\alpha$ -Carotene,  $\beta$ -carotene,  $\beta$ -cryptoxanthin, and total carotenoids were associated with a 46% reduction in risk of the more aggressive types of cancer than recurred or caused death.

In this large prospective analysis with 20 y of follow up, women with the highest blood levels of carotenoids had a significant reduction in breast cancer risk, and particularly the more aggressive and lethal subtypes.

A Heather Eliassen et al. Plasma carotenoids and risk of breast cancer over 20 y of follow-up. Am J Clin Nutr doi: 10.3945/ajcn.114.105080