

Fruit, vegetable extracts could boost immunity

By Stephen Daniells

10/9/2006- **Phytonutrients from fruit and vegetables, delivered as a dietary supplement, boosted the immune system of healthy adults, as well as protecting against DNA damage, says a new study from the US.**

Many consumers are failing to meet the target of five portions of fruit and vegetables every day, with recent studies have shown that the average consumption of people in developed countries is three portions a day.

Indeed, it is estimated that 4.4 per cent of the overall disease burden in Europe is due to fruit and vegetable-poor diets (*Public Health Nutrition*, 2003, Vol. 6, pp. 453-461). And over 20 years' worth of epidemiological studies have linked diets high in fruit and vegetables to lower risks of cancer, metabolic syndrome and osteoporosis.

The new research, published in the October issue of the *Journal of Nutrition* (Vol. 136, pp. 2606-2610), suggests that adding a phytonutrient-rich capsule to the diet may provide a convenient way of benefiting from the benefits, particularly for immune health.

"We hypothesized that a commercially available encapsulated fruit and vegetable juice powder concentrate (FVJC) could support functional indices of health due to increased intake of various phytonutrients," said lead author Meri Nantz from the University of Florida.

The researchers recruited 59 healthy law students to take part in the double-blind, randomized, placebo-controlled study. The subjects were randomly assigned to receive either a capsule of fruit and vegetable juice powder concentrate or a placebo for 77 days.

Blood samples were taken at the start, half-way stage and end of the study, and levels of T-cells (white blood cells that play a central role in immunity), cytokine production, DNA damage in white blood cells, antioxidant levels, and circulating levels of vitamin C and carotenoids were measured. The subjects were also required to keep a diary of symptoms and illnesses during the study.

Nantz and her co-workers report that, at the end of the study, the group receiving the fruit and vegetable extract capsule reported fewer symptoms than the placebo group. Blood analysis revealed that T-cell concentrations had increased by 30 per cent for the FVJC group after 77 days, and DNA damage in white blood cells had been decreased by 40 per cent, compared to placebo.

Circulation levels of vitamin C and the carotenoids, beta-carotene, lycopene, and lutein were found to have increased significantly in the fruit and vegetable concentrate group, and the antioxidant status increased accordingly by 50 per cent, compared to placebo (oxygen radical absorptive capacity).

No change in circulating cytokine levels was recorded.

"FVJC consumption during this study period resulted in increased plasma nutrients and antioxidant capacity, reduction in DNA strand breaks, and an increase in circulating T cells," concluded Nantz.

A recent study from the *Journal of the American Dietetic Society* (Vol. 106, pp. 1394-1404) reported that people who eat salads have higher serum levels of vitamins C and E, folic acid, and carotenoids, and suggested that consumption of vegetables may be more important than that of fruits.

"Much of the research on diet and cancer points to vegetable consumption being more strongly associated with reduced risk than fruit intakes," wrote Joseph Su from Louisiana State University Health Sciences Center and Lenore Arab from the Los Angeles School of Public Health. *"Thus, in terms of broad recommendations and chronic diseases, it may be more important to increase vegetable consumption than fruit consumption."*