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CRANBERRY JUICE BEVERAGE EFFECTIVE AGAINST ULCER-CAUSING BACTERIA

In a double-blind, randomized placebo-controlled study, a cranberry juice beverage was effective in reducing instances of *Helicobacter pylori* infection, a leading cause of peptic ulcers. Since these ulcers are a leading precursor to gastric cancer, this preliminary study also suggests that regular cranberry consumption could be a helpful preventative measure against the second most common form of cancer worldwide.

Researchers used C-urea breath tests to identify perspective participants, and only those who tested positive for *H. pylori* infection were considered for the study. Participants were randomized to receive either 250 ml of a cranberry juice beverage or a placebo beverage twice daily for 90 days. Researchers tested the subjects for *H. pylori* using the C-urea breath test at 35 and 90 days of intervention and all field and laboratory procedures were performed double-blind. In the end, 189 subjects completed the trial.

After 90 days, 14 of the 97 subjects in the cranberry group tested negative compared with five of the 92 subjects in the placebo group. Of the 14 who tested negative, 11 were negative at both 35 and 90 days, while only two of the five in the placebo group tested negative on both days. These results are statistically significant and support other data that suggest cranberry consumption may suppress *H. pylori* infection. While the mechanism is not yet clear, researchers theorize that the proanthocyanidins in cranberry inhibit bacterial adhesion to the gastric mucosa. This antiadhesion mechanism is what makes cranberry consumption effective in the prevention of urinary tract infections (UTIs) and potentially even in preventing diseases of the gums.

H. pylori has an 80 percent prevalence rate in developing countries and is associated with an increased risk of developing gastric cancer. Treatment generally involves a triple therapy that combines antibiotics with a proton pump inhibitor. In some cases, the bacteria become resistant, calling for a more aggressive type of treatment that often produces moderate to severe side effects. Cranberries have already been shown to be effective in helping eliminate antibiotic-resistant strains of bacteria that cause UTIs, and this data suggests a similar role against *H. pylori*.

Reference: Zhang, L. et al. Efficacy of cranberry juice on *Helicobacter pylori* infection: a double-blind randomized placebo-controlled trial. *Helicobacter* 2005;10:139-45.



Anti-Inflammatory Properties of Cranberry May Decrease Risk of Atherosclerosis

Researchers at the University of Wisconsin-Madison School of Veterinary Medicine tested the vascular anti-inflammatory effects of cranberry juice powder on pigs with familial hypercholesterolemia (FH) for a period of six months. These pigs were predisposed to develop high levels of cholesterol and atherosclerosis, as would humans with FH.

After six months, there was pronounced improvement in the vascular function of the FH pigs fed cranberry juice powder, suggesting the bioactive compounds in cranberry may decrease the risk of atherosclerosis. Cranberries contain antioxidants, flavonoids and other polyphenols; any or all of which may have anti-inflammatory actions.

The next steps are to determine what specific components of cranberries are most important to the improvements in vascular function that were observed and exactly how cranberries modify blood vessel relaxation.

Reference: Paper presentation: "Cranberry juice modulates atherosclerotic vascular dysfunction," by Kris Kruse-Elliott at the 35th Congress of the International Union of Physiological Sciences in San Diego, March 31 - April 5, 2005.

CRANBERRY CONSUMPTION MAY HAVE ANTI-INFLAMMATORY EFFECTS SIMILAR TO ASPIRIN

Acetylsalicylic acid (aspirin) has been used for over a century to provide pain relief and to treat inflammatory conditions and fever. More recently, research has shown that regular intake may be associated with a decreased incidence of certain types of cancer, particularly colon cancer. While the exact anti-inflammatory mechanism of salicylic acid and aspirin is unknown, it has been shown to inhibit expression of cyclo-oxygenase 2 (COX-2), thereby decreasing the synthesis of proinflammatory prostaglandins. Since cranberries contain salicylic acid, researchers wanted to measure the bioavailability of these anti-inflammatory compounds.

Two groups of healthy female subjects consumed either 250 ml of cranberry juice or a placebo solution three times a day for two weeks. Blood and urine samples were collected from the subjects and measured for salicylic acid and its urinary metabolite, salicyluric acid. Within one week of the intervention, researchers saw a marked increase in urinary salicylic acid and salicyluric acid in those consuming cranberry juice over those consuming placebo solution. Concentrations of the urinary metabolite were an order of magnitude greater than salicylic acid, which is a good indicator of bioavailability. The increase in plasma concentrations of the cranberry group was less extreme but still statistically significant after two weeks of consumption.

There has been some debate among the scientific community as to whether sufficient amounts of salicylic acid can be obtained from the diet to exert anti-inflammatory effects similar to those seen from aspirin. Although salicylic acid is likely to be present in most plant-based foods, there is great variability in the estimated salicylate content of those foods. Researchers also question the bioavailability of these active compounds when obtained from food sources. However, serum and urinary concentrations of salicylic acid and salicyluric acids are greater in vegetarians than in nonvegetarians and overlap with those in individuals taking up to 150 mg of aspirin per day. (This is just under half of a standard one-tablet dose of aspirin, which contains 325 mg.) This suggests that potentially therapeutic levels of salicylic acid could be achieved by consuming salicylic acid-rich foods.

The increased urinary concentrations of salicyluric acid measured in this study are an indication that regular consumption of cranberry juice results in the increased absorption of salicylic acid and may have anti-inflammatory benefits similar to aspirin.

Reference: Duthie, G.G., Kyle, J., McE, A., et al. Increased salicylate concentrations in urine of human volunteers after consumption of cranberry juice. *J. Agric. Food Chem.* 2005; 53: 2897-2900.



Calendar of Events

American Association of Nurse Practitioners Annual Meeting – Visit the CI Booth, June 17-21, 2005, Ft. Lauderdale, FL. For more information, visit www.aanp.org

American Dental Hygienists' Association Annual Meeting, June 22-29, 2005, Henderson, NV. For more information, visit www.adha.org

School Nutrition Association Annual Meeting – Visit the Cranberry Marketing Committee booth, July 17-20, 2005, Baltimore, MD. For more information, visit www.asfsa.org

National Conference of Gerontological Nurse Practitioners, September 28 – October 2, 2005, Cleveland, OH. For more information, visit www.ncgnp.org

American Dental Association, October 6-9, Philadelphia, PA. For more information, visit www.ada.org

American Dietetic Association – Visit the Cranberry Marketing Committee booth, October 22-25, 2005, St. Louis, MO. For more information, visit www.eatright.org

EXPERIMENTAL BIOLOGY RESEARCH ROUND-UP

Researchers from around the globe met in April at the Experimental Biology conference in San Diego to share the latest data and discuss advances in biological research. Following are some snapshots of cranberry-related research presented at the conference.

Lipid Lowering Effects of Low-Calorie Cranberry Juice

Caron, A.D., Kautza, B.C., Wilson, T. Biology, Winona State University.
In this study, subjects were randomized to cranberry juice or an isocaloric placebo. The cranberry group consumed low-calorie cranberry juice (34.5 kcal/8oz; 4.3 ml/kg) twice daily for 28 days. Blood samples were collected and analyzed for changes in total, LDL, HDL and triglyceride levels and weight changes were recorded. Although there were no statistical differences in body weight, the low-calorie cranberry juice did promote a decrease in total and LDL cholesterol. Researchers noted that low-calorie cranberry juice has a low glycemic index and may be useful for heart disease prevention in populations that are unable to reap the benefits of red wine due to alcohol or glycemic index restrictions.

Cranberry Flavonoids May Help Prevent Cancer Cell Growth

Matchett, M., Compton, K.A., Miwako, K., Neto, C.C., Hurta, R. Biology, University of Prince Edward Island, Chemistry and Biochemistry, University of Massachusetts Dartmouth.

Polyamines are small molecules that are required for cancer cell growth and survival. Agents that interfere with polyamine metabolism have been found to arrest cell growth and, in some cases, promote cell death. Investigators looked at the effect of a “crude” cranberry fraction on cancerous cells and found a decrease in the expression of ornithine decarboxylase (ODC), a major polyamine biosynthetic enzyme. This leads to a depletion of intracellular polyamine concentration and can result in apoptosis. Results from this study suggest that cranberry flavonoids may have a role in preventing cancer cell growth.

No Significant Interaction between Cranberry Juice and Warfarin

Li, Z., Seeram, N., Carpenter, C., Heber, D., Medicine, UCLA, Center for Human Nutrition.

In 2003, a report from the UK's Committee on the Safety of Medicines suggested that cranberry beverages might interact with warfarin medications, preventing their anti-clotting effectiveness. This randomized, placebo controlled, cross-over study measured the effect of cranberry juice on International Normalized Ratio (INR) of patients taking warfarin for atrial fibrillation. INR, a widely accepted standard unit for reporting prothrombin time (PT), was measured at baseline and on days two, four and seven. For all of the test points, INR did not change significantly from baseline and none of the mean differences between cranberry and placebo were significant. Results suggest that there is no significant interaction between cranberry juice and warfarin.