



Fortified for Health

How are cranberry juice drinks fortified? Typically, beverage companies fortify cranberry juice drinks with vitamin C, providing over 100 percent of the Daily Value in an eight-ounce serving. Additionally, your patients and clients may choose a calcium-fortified drink that can help boost calcium intake when consumed regularly. This beverage provides approximately 10 percent of the Daily Value in each eight ounce serving. Finally, some brands fortify their cranberry juice beverages with vitamins A and E, also providing about 10 percent of the Daily Value for these nutrients. Patients who wish to know the exact percentage of Daily Value should check the Nutrition Facts on the label of the beverage, as some variation will occur from product to product.

If you would like to receive a monthly email reminder that will link you to this newsletter, or if you have comments, questions or suggestions, please e-mail: cinews@publicis-pr.com

Identification of Antitumor Activity in Whole Cranberry Fruit

A research team from the University of Massachusetts at Dartmouth will publish results of its study, titled *Identification of Triterpene Hydroxycinnamates with in Vitro Antitumor Activity from Whole Cranberry Fruit (Vaccinium macrocarpon)*, in an upcoming issue of the *Journal of Agricultural and Food Chemistry*.

Murphy et al, in Dr. Catherine C. Neto's laboratory, have focused their ongoing research on a primary goal of determining the structure and activity of chemopreventive compounds in cranberry and medicinal plants. They screened cranberry extracts for in vitro antitumor activity in nine cell lines and reported initial findings in 2002. They observed that an extract of whole cranberry had selective activity against some tumor cell lines.

Further investigation of the composition of the extract has led to the isolation of two compounds – the *cis*- (Compound 1) and *trans*- (Compound 2) isomers of 3-*O*-*p*-hydroxycinnamoyl ursolic acid – previously unreported in cranberry, that inhibit tumor cell growth in specific cell lines including breast, prostate, lung, cervical and leukemia (*see table*). Compound 1 proved more effective than Compound 2 in inhibiting tumor growth in all cell lines tested, with the greatest effectiveness observed in breast tumor cells, where 50 percent growth inhibition occurred at concentrations of less than 20 μ M. Cranberry also inhibited cervical and prostate tumor growth at similar concentrations.

In Murphy et al's study, one of the most powerful antioxidants in cranberry fruit (cyaniding-3-galactoside) did not significantly exhibit itself as a tumor growth inhibitor. This indicates that cranberry's anti-cancer benefits may not correlate with antioxidant activity. Instead, the evidence suggests that the antitumor activity of cranberry may stem from its anti-inflammatory properties, an area requiring further research.

In the meantime, this research demonstrates once again that cranberry fruit has the potential to offer a broad range of health benefits due its unique chemistry. Future studies may further elucidate the mechanisms by which the cranberry offers protection against cancer and other diseases related to oxidative and inflammatory processes.

Cytotoxicity of Ursolic Acid p-Hydroxycinnamate Esters from Cranberry Fruit in Tumor Cell Lines

Cell line	GI ₅₀ (μ M)* Compound 1	GI ₅₀ (μ M)* Compound 2
BALB/3T3 (murine fibroblasts)	21.6	75
H460 (human large cell lung carcinoma)	27.1	84
ME180 (human epidermoid cervical carcinoma)	23.3	42
DU145 (human prostate metastatic carcinoma)	28.4	25-100
MCF-7 (human breast adenocarcinoma)	18.8	25-100
M-14 (human melanoma)	46.4	25-100
HT-29 (human colon adenocarcinoma)	32.9	40
PC3 (human prostate adenocarcinoma)	24.3	25-100
K562 (human chronic myelogenous leukemia)	28.9	25-100

* GI₅₀ (μ M) = concentration required to inhibit tumor cell growth by 50 percent relative to control.

Table provided by co-author Dr. Catherine C. Neto.

Calendar of Events

American Aging Association 2003 Annual Conference: Nutritional Modulation of Aging and Age-Related Diseases,

June 6-9, 2003, Baltimore, MD. For more information, visit www.americanaging.org

Florida Dietetic Association 2003 Annual Meeting, July 13-16,

2003, Naples, FL. Dr. Martin Starr will give a presentation titled "Cranberry Health Research Update: Big Benefits in a Small Package." For more information, visit www.eatrightflorida.org

American Dietetic Association 2003 Food & Nutrition Conference & Expo, October 25-28,

2003, San Antonio, TX. For more information, visit <http://www.eatright.org/function/2003.html>

The CI constructed a Technical Committee to review research proposals, evaluate their merit and applicability to the strategic goals of the program and assist in the development of a recommendation to the Board. The primary research priorities are health benefits unique to cranberry; the secondary priorities are the identification and quantification of cranberry health benefits found in other berries, fruits, and/or vegetables as well.

The CI developed a request for proposals (RFP) and forwarded it to the research community, including current and former researchers, the Scientific Advisory Board, other research contacts and cranberry processors and handlers, with a due date of March 1. The CI received a total of 20 proposals, covering a wide range of health research projects. Using the criteria identified above, the Technical Committee developed final recommendations.

As is typical, the volume and funds represented by the proposals far exceeded the available research funding, including funds graciously added by the Wisconsin Cranberry Board. Consequently, the CI could not fund all of the many high quality proposals, and the CI has sent the lead researchers its regrets and advised them to resubmit their proposals to other private and government funding sources. The CI most sincerely thanks all the researchers for their submissions, fully intends to stay in close contact with them and wishes them every success in their research programs. The funded projects include the following:

1. **Plhak, L. U. Wisconsin: Evaluation of biologically active components in cranberries.** A continuation of her research program, now focusing on cardiovascular factors.
2. **Wilson, T. U. Wisconsin: Ability of cranberry sauce to provide heart and urinary tract health benefits.** A quick study that should be available in Fall 2003, in time for the cranberry sauce season.
3. **Gilden, J. U. of Chicago: Effects of cranberry on reducing oxidative stress in the treatment of peripheral and autonomic neuropathy in patients with diabetes mellitus.** This project could show novel benefit against diabetes, a major and growing disease.
4. **Seeram, J. UCLA: Estrogenicity of cranberry extract.** An exciting new area of cranberry research.
5. **Neto, C. UMASS-Dartmouth: Investigation of the role of cranberry antioxidants in pathological cardiovascular events.** The study also includes stroke factors.

Recipe: Cranberry-Berry Smoothie

The possibilities for making a smoothie seem almost endless. Encourage patients and clients to experiment with different ingredients, like cranberry juice, until they find the right combination for their tastes. This version offers a delicious start.

In a blender combine:

1	banana
1	cup frozen raspberry low fat yogurt
2/3	cup cranberry juice
1/2	cup frozen blueberries
1/2	cup frozen raspberries

Blend until well combined. Serves 2.

Recipe courtesy of Spinner Publications, *Cranberry Cooking for All Seasons*

Nutritional Analysis Per Serving: Calories 246.5; Protein 3.2 g; Fat .4 g; Mono unsaturated fat 0; Poly unsaturated fat 1%; Saturated fat 0; Carbohydrates 59.3 g; Cholesterol 0; Fiber 4.9 g; Sodium 72.5 mg.