

# Blueberry Research Excerpts



## Blueberries and Aging

*Previous studies of older laboratory animals consuming blueberry supplemented diets have shown measurable improvements in memory, coordination and balance. New studies also report benefits.*

**Goyarzu P, Lau FC, Kaufmann J, Jennings R, Taglialatela G, Joseph J, Shukitt-Hale B, Malin DH. Age-related increase in brain NF-B is attenuated by blueberry-enriched antioxidant diet. Program No. 98.3. Abstract. Washington DC: Society for Neuroscience, 2003.**

Researchers from the Universidad Nacional Autonoma de Mexico, University of Houston-Clear Lake, University of Texas and Tufts University have found that a blueberry-enriched diet prevented an age-related increase in the protein NF-B. NF-B is a protein transcription factor that is elevated by aging and oxidative stress. The rats were maintained for four months on a control diet or a blueberry-enriched diet. In 4 out of 5 regions of the brain, aged rats maintained on the control diet had significantly higher average NF-B levels than the younger rats on the same control diet. The aged rats on the control diet also had significantly higher NF-B levels than the aged rats on the blueberry-enriched diet in 4 out of 5 regions of the brain. The level of NF-B in the aged rats on the blueberry-enriched diet and the young rats on the control differed significantly in only one region of the brain.

**Spangler EL, Duffy K, Devan B, Guo Z, Bowker J, Shukitt-Hale B, Joseph JA, Ingram DK. Rats fed a blueberry-enriched diet exhibit greater protection against a kainate-induced learning impairment. Program No. 735.10. Abstract. Washington DC: Society for Neuroscience, 2003.**

Rats were fed either a control diet or a diet supplemented with a 2% blueberry extract for 8-10 weeks. Rats were then injured in the dorsal hippocampus region of the brain. They were then evaluated in a maze task that was proven to be sensitive to aging and hippocampal dysfunction. All rats exhibited a learning impairment in the maze task after injury however the rats on the blueberry diet had significantly less impairment than that observed in the control diet group.

## Blueberries and Storage

**Zheng Y, Wang CY, Wang SY, Zheng W. Effect of high-oxygen atmospheres on blueberry phenolics, anthocyanins, and antioxidant capacity. *J Agric Food Chem* 2003;51:7162-7169.**

This paper looked at the influence of high oxygen concentrations on total phenolic, total anthocyanin, phenolic compounds and oxygen radical absorbance capacity (ORAC) in highbush blueberries. They found that fruit treated with 60, 80 or 100% O<sub>2</sub> at 5 °C had significantly less decay rate and higher ORAC, phenolic and anthocyanin content after 5 weeks of storage as compared with 40% O<sub>2</sub> treatment or air control.

## Research Sessions, 2004 National IFT, July 12-16, Las Vegas

**Boyd, LC, Carlson, JS, Carroll, DE. Effects of processing on antioxidant activity of blueberry juices. Dept. of Food Science, North Carolina State University. Session 31-2, Fruit & Vegetable Products: General.**

In blueberry varieties tested, using four different processing methods, results indicated that higher heat treatments (i.e., pasteurization followed by microwave) were the most effective in releasing antioxidants into juices as measured by total phenol (TP), ORAC, and anthocyanins. No measurable decreases in antioxidant activity or changes in anthocyanins were noted when refrigerated juices were stored 30 days.

**Wang, CY. Antioxidant capacity, phenolics, and anthocyanins in blueberry fruit as affected by high oxygen storage atmosphere. Plant Sciences Institute, USDA-ARS-Beltsville Area, Produce Quality & Safety Lab, Beltsville, MD. Session 49E-5, Fruit & Vegetable Products: Fresh fruit.**

The objective of the study was to determine the effect of high oxygen treatment on total phenolic, total anthocyanin, individual phenolic compounds and antioxidant capacity (ORAC) in blueberries. Results suggest that high oxygen treatments may improve the antioxidant capacity of blueberry fruit. Antioxidant capacity may be correlated with total phenolic and anthocyanin content in blueberries.

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*Ask for US Highbush Blueberries!*

We're on the web at:  
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### Students Rally for the Highbush Blueberry

#### **New Jersey Declares It Official State Fruit!**

On January 12 Gov. James E. McGreevey of New Jersey signed a bill into law naming the blueberry the Garden State's official fruit. The signing took place at Veterans Memorial Elementary School in Brick, NJ. According to an article in Newsday.com (1-12-04), 22 percent of the nation's blueberries are produced across seven central and southern New Jersey counties. The impetus to get the blueberry named the official state fruit is attributed to these students, who campaigned to get the fruit named. We are proud of these future voters! See the "news" section of the US Highbush Blueberry Council's website ([www.ushbc.org](http://www.ushbc.org)) for a photo and details.

## Blueberries in the Popular Press

### Blueberries are Berry, Berry Good

A *Los Angeles Daily News* article, "Berry, berry good for you" (Sunday, 3/14/04) describes the health benefits of berries including anthocyanins, vitamin C, and soluble fiber. The article quotes Colette Heimowitz, vice president of education and research for the Atkins Health and Medical Information Service. According to the article, Heimowitz says, "The whole principle behind controlling carb consumption is to avoid spikes in blood sugar from high-carb food....Berries offer all of the health benefits of fruit without the high-carb or high-glycemic load."

## Blueberries Make "Dream Team" of Super Foods -- Named "Best Fruit"

The November 2003 issue of *Self Magazine* has a selection of super foods, considered by a panel of 37 nutrition experts to provide "more energy for fewer calories and a body built to last." The blueberry was chosen "best fruit." According to the article (p. 140), blueberries' natural blue color "signals a concentration of anthocyanins, a substance that may help prevent heart disease (cranberries have anthocyanins, too, but blueberries boast more)." Joanne Shearer, RD, a dietitian at Heart Hospital of South Dakota in Sioux Falls notes that blueberries also "contain phytonutrients like lutein and fiber, which reduce the risk for diabetes and circulatory problems."

The panel consisted of 34 members of the American Dietetic Association along with Sharon Tyler Herbst author of *The Food Lover's Companion* (Barron's); Andrew Weil, MD from the University of Arizona College of Medicine (Tucson) and author of *Eating Well for Optimum Health* (Quill); Lisa Young PhD from New York University Department of Nutrition, Food Studies and Public Health.

**Molva, Kari and Bannan, Patricia. "12 bare essential foods -- eat these and you're covered!" *Self Magazine*. Nov. 2003. p. 138-141, 181.**

## Blueberries' Life Changing Potential

*Superfoods Rx: Fourteen Foods that Will Change Your Life*, by Steven Pratt, MD and Kathy Matthews includes blueberries in the listing. Pratt, an ophthalmologist specializing in ocular plastic surgery at Scripps Memorial Hospital in La Jolla, Calif., became convinced of the benefits found in certain foods when he saw the positive results of a few simple diet changes in patients suffering from age-related macular degeneration - a leading cause of blindness.

**Pratt, S and Matthews, K. *Superfoods Rx: Fourteen Foods That Will Change Your Life*. New York: HarperCollins Publishers, Inc., ISBN: 0060535679.**

## Blueberries and Alzheimer's Disease Prevention

The January 2004 issue of *Prevention Magazine* (p. 58) reports in the "food & nutrition" column entitled, "Blueberries outsmart Alzheimer's," that blueberries contain an antioxidant that may help prevent a genetic disposition to Alzheimer's disease. The story quotes Dr. James Joseph from Tufts University, who is known for work with blueberries and anti-aging. "Our results suggest for the first time that it may be possible to overcome a genetic predisposition to Alzheimer's disease through diet," says Dr. Joseph in the article. The research article, referred to in *Prevention* is from the following by Dr. Joseph:

**Joseph JA, Denisova NA, Arendash G, Gordon M, Diamond D, Shukitt-Hale B, Morgan D. Blueberry supplementation enhances signaling and prevents behavioral deficits in an Alzheimer disease model. *Nutr Neurosci* 2003; 6:153-162.**