

BERRY WORKS NEWS

a grower newsletter for the
Oregon Raspberry & Blackberry Commission
Oregon Strawberry Commission

FALL 2000

ANTIOXIDANTS by Cat McKenzie

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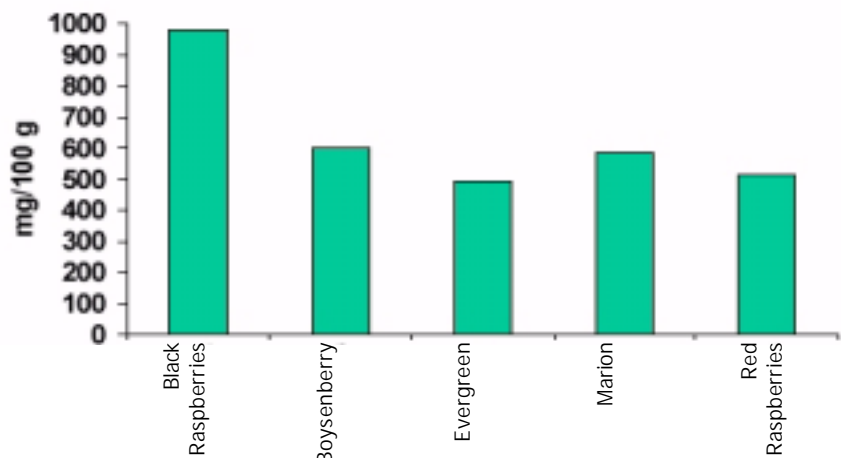
Caneberry growers from all across Oregon have reason to smile today. The good news is in from the 1999-2000 study on the nutraceutical benefits of caneberries. Conducted with help from a \$63,000 Federal State Market Improvement grant, the study's results are now complete and have exceeded all expectations. Levels of anthocyanins, ellagic acid and total phenolics in caneberries were measured and shown to be much higher than previously reported.

Caneberry antioxidants were studied in blackberries, red raspberries, Boysenberries, Marionberries and black raspberries. The Oxygen Radical Absorption Capacity (ORAC), anthocyanin and phenolic compounds were measured and compared in all berries.

Total Phenolic Values

All berries studied showed significant amounts of phenolic and flavonoid compounds including gallic acid, rutin, isoquercitrin and ellagic acid. The most widely recognized of these is ellagic acid, which has been shown to inhibit tumor development and growth in animals in laboratory studies. The total amount of ellagic acid was highest in black raspberries, but Boysenberries were unique in their high concentration of free ellagic acid. Levels of ellagic acid in all caneberries were higher than previously reported in scientific literature.

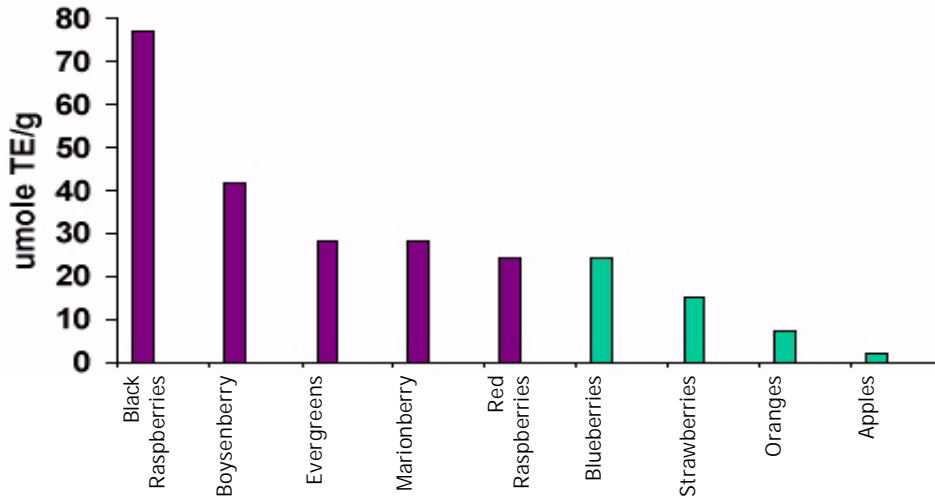
Total Phenolics



ORAC Value

ORAC values measure the degree and length of time a sample of berries inhibits the action of an oxidizing agent. Antioxidants fight the spread of free radicals, which can cause cell mutation and lead to various cancers as well as other diseases of aging. All listed berries were tested for ORAC value. The results showed black raspberries at the highest levels having an astounding 77, with Boysenberries at 48, Marionberries and Evergreen blackberries at 28 and red raspberries at 24. Compared to other fruits such as blueberries at about 23 and strawberries at around 12 or oranges and apples both below 5, caneberries are among the highest fruits in antioxidant levels.

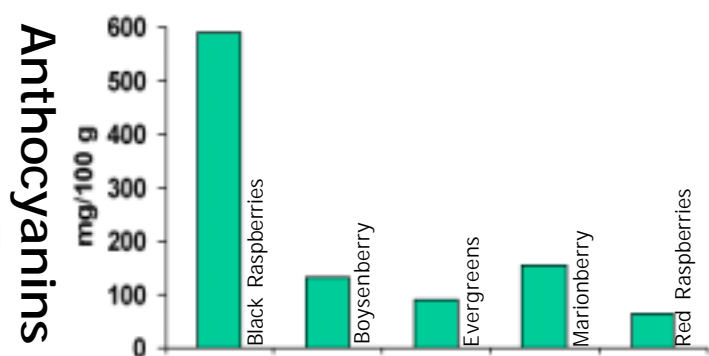
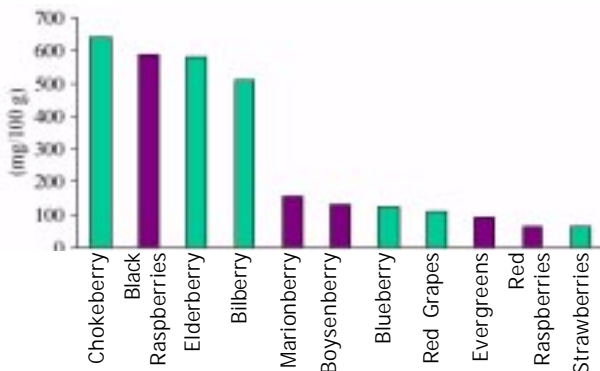
ORAC of Berries vs. Other Fruit



Anthocyanins

Also measured were anthocyanin levels. Anthocyanins fight against heart disease and age related mental decline. Black raspberries once again scored the highest with levels reaching 600 mg, comparable only to chokeberry, bilberry and elderberry. Next highest were Marionberries approximately 150, Boysenberries around 125, Evergreen blackberries near 90 and red raspberries at 50. All caneberries did exceptionally well when compared to other fruits.

Very few studies have been done specifically on Marionberries, Boysenberries and black raspberries. Therefore this study provides much needed data that shows conclusively that caneberries are among the highest foods in health enhancing antioxidant activity and contain significant amounts of phenolics and anthocyanins. Data collected in the market research phase of the grant showed that consumer interest in dietary health is high. The booming nutraceutical and functional food market is creating ways for very healthy foods such as caneberries to be used in a multitude of products. This exciting news provides a basis for new marketing strategies and new avenues to approach consumers regarding the outstanding benefits of Oregon berries. A complete copy of the study may be obtained by contacting the ORBC office at 541-758-4043.



Nature's Power-house of Health

by Cat McKenzie

What if you had access to a product that had a strong potential to help you fight the onset of cancer or arrest the growth of established malignancies? What if evidence showed it could potentially forestall the aging process and keep your mind sharp well into old age? What if the same substance contained chemical compounds that could lower your risk of heart attack? Wouldn't you eagerly travel far and wide to locate such an important piece of the health puzzle?

There is no need to search exotic locals for a mysterious herb or ask for a wonder drug at your pharmacy. Look no further than your corner grocery store or your back field for this miracle food – it's berries. The same berries you're used to seeing in your morning muffin or in the slice of pie at dinner are capable of providing nutrients that can improve your health and the quality of your life for years to come.

Aspects of Nutraceuticals

Scientific studies are reporting new information on the phytochemical and nutraceutical properties of berries every day. The term nutraceutical was first coined by the Foundation for Innovation in Medicine in 1989 to name the rapidly growing area of biomedical research which links nutrition and health. "A nutraceutical can be defined as any substance that may be considered a food or part of a food and provides medical or health benefits, including the prevention and treatment of

disease."

Nutraceutical products may range from isolated nutrients and dietary supplements, such as vitamins and herbs, to genetically engineered "designer" foods, and include herbal products and processed foods such as energy bars and juices.

Nutraceuticals also include whole foods such as fruits and vegetables that contain naturally occurring phytochemicals. From the Greek root "phyto" meaning plant, phytochemicals are non-nutritive chemicals found in edible fruits and vegetables that promote health and prevent chronic disease. Phytochemicals are used by plants as a defense against pests and adverse growing conditions. Research now suggests that these same substances which protect plants may benefit humans, protecting them from chronic diseases such as heart disease, cancer, diabetes, and hypertension, forestalling mental aging and perhaps fighting Alzheimer's Disease.

One class of phytochemicals is phenolic compounds. Two main classes of dietary phenolics are flavonoids and phenolic acids.

Anthocyanins – One Piece of the Puzzle

Anthocyanins are part of the flavonoid family; they give blackberries their characteristic blue color. The antioxidant characteristics of fruits appear to be due largely to the anthocyanins. The darker, more deeply red and blue colored fruit, usually have the highest antioxidant values. We have all heard about the importance of antioxidants in forestalling the aging process. Just as your metal saw left out in the elements rusts due to oxidation, your body deteriorates due to the

effects of oxidation. Antioxidants fight the process of aging by fighting off the diseases associated with old age. Antioxidants neutralize free radicals, which can damage DNA molecules and lead to cancer. They also counteract environmental carcinogens, protect against cardiovascular disease, fight sun damage to skin and may thwart the effects of Alzheimer's and other age related disorders. Blackberries and raspberries are among the top ten foods containing the highest antioxidant levels.

Eating even modest amounts of these berries, just one cup a day, can provide your body with the highest daily intake of antioxidants recommended by authorities. Antioxidant levels are measured in ORAC numbers.

ORAC VALUES OF BERRIES

Studies by Dr. Jim Joseph, at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University in Boston, suggest that consuming fruits and vegetables with a high ORAC value may slow the aging process in both body and brain. ORAC, short for Oxygen Radical Absorbance Capacity, is a measure of the ability of foods, blood plasma and just about any substance to "sponge up" oxygen free radicals. Oxygen free radicals are the harmful by products formed through the body's metabolism, free radicals damage cells and initiate carcinogenesis, which is the development of cancerous cells. Research has shown that antioxidants work best when combined and that the presence of fiber and other plant compounds may provide additional health benefits. Consequently it is recommended that you get most of your antioxidants from your diet rather than relying on supple-



Raspberry & Blackberry News



New Commissioner Needed

The ORBC is short one grower representative this year. If you are an Oregon raspberry or blackberry grower and you are interested in representing berry growers on the commission please contact Janni at the ORBC office to receive an application form.

Phone: 541-758-4043
Fax: 541-758-4553
email: janni@oregon-berries.com

Oregon Raspberry & Black- berry Commission 2000-2001 Committee List

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ments. Measured in ORAC units, blackberries have 2400 units per 100 grams, raspberries 1220, and blueberries 2400. Compare these numbers with the much touted antioxidant abilities of broccoli at 980 and you'll find that berries carry their own sweet rewards.

Ellagic Acid

Berries are extremely high in another phenolic compound, ellagic acid. Ellagic acid is a phenolic acid phytochemical. It works as a potent anti-carcinogen by binding cancer-causing chemicals found in the body and making them inactive. Ellagic acid is found in many fruits and vegetables, but levels are about five or six times higher in raspberries and blackberries than those in apples, pears and plums. Ellagic acid may well provide yet another piece of the anti-aging puzzle. Research by Dr. Daniel Nixon, president of the American Health Foundation at the Hollings Cancer Center of South Carolina, indicates that the ellagic acid in red raspberries may prevent several types of cancer by inhibiting the development of cancer cells, and arresting the growth of cancer in persons with a genetic predisposition for the disease. In a 30 week study, rats fed a diet consisting of 5% whole freeze dried raspberries had 39% fewer tumors than rats not fed the berries, while those fed a 10% raspberry diet had 49% fewer tumors.

Tests indicate that ellagic acid is specifically effective on colon, cervical, breast and pancreatic cancer cells. Studies on ellagic acid indicate it may prevent cancer growth and may halt the development of pre-invasive cancerous growths. Cancers take years, even decades to go from normal to invasive cell growth. Dr. Nixon estimates that 20 million Americans are in this gap area, between normal cell growth and cancer. Using the results of this research each of us can make an informed choice to eat more of the types of food shown to be beneficial to health, and lessen our chances of proceeding from this gap area to advanced stages of disease. Statistics show that Americans consume less fruits and vegetables than are recommended for overall health. Armed with the knowledge that certain foods provide more advantage to our health than others do, we can protect our bodies through sensible eating.

Salicylic Acid

Salicylates, used to make aspirin, are found in many fruits and vegetables, particularly berries. Until recently it was not known if dietary salicylates could be absorbed by the body. New research shows that eating fruits and vegetables may boost blood levels of salicylic acids. Studies are presently being conducted at the National Center for Health Statistics in Hyattsville, Maryland, to determine if salicylates in our diet can prevent heart attacks. According to Dennis Sprecter, MD, and Section Head of the Cleveland Clinic Foundation in Ohio, "This is worth paying more attention to."

Fresh vs. Processed Berries: Is There a Nutritional Difference?

While fresh berries are delicious, consumers have access to them only 2 months of the year. Fortunately, berries are available year round in many forms, including IQF (individually quick-frozen), pureed, canned and dried. You may ask if processing such as cooking or freezing berries affect the phytochemical properties they contain. The answer is a resounding no! Dr. Jim Joseph, of Tufts University conducted studies to determine the effects of storage time and temperature on the anthocyanins, phenolics and vitamin C content and ORAC of strawberries, raspberries, and blueberries. Results indicate that with ambient or slightly higher than ambient temperature, the phenolic and anthocyanin content of raspberries *increased* when stored at 0 degrees. In addition the ORAC

See 'Nature's Powerhouse' pg. 6



Berry Works News

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New Information on the Web

- By Berry Works, Inc. -

The Oregon Raspberry and Blackberry Commission (ORBC) and the Oregon Strawberry Commission (OSC) both have pages full of berry information on the web.

We have added nutraceutical information to the ORBC page, which can be found at www.oregon-berries.com and have added our newly published Product Development Guide to the OSC page, which can be found at www.oregon-strawberries.org.

So when you're out there surfing the net, stop by and check out the newly updated commission pages and if you have any questions, please feel free to contact us.

NCSFR Annual Meeting

- The Northwest Center for Small Fruits Research (NCSFR) is holding their annual conference in Kennewick, Washington, this year. The main conference day is Tuesday, November 28th, from 8 a.m. until 9:00p.m.
- The Liaison Committee, Advisory Council and Coordinating Committees will meet Wednesday morning and the research proposal review will be held on Monday evening.
- If you are interested in attending the research conference, please contact Janni at Berry Works office for more information or if you would like to be added to the NCSFR mailing list: Phone, 541-758-4043 or berrywrk@peak.org.

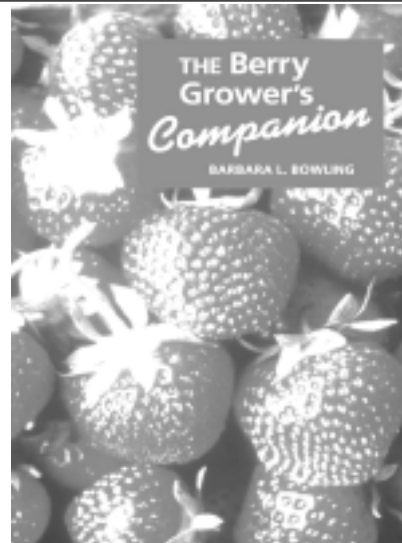
'Nature's Powerhouse' from pg. 5
value of berries also **increased**.
In laymen's terms, you can
freeze them, cook
them or dry them and berries
retain or increase many of the
nutritional and phytochemical
properties that they have when
fresh.

Yes ,You Are What You Eat

All of the interest in nutraceuticals on the part of scientists, health professionals and consumers largely stems from U.S. health statistics. The fact is, what we eat is implicated in six of the ten leading causes of death in the United States. (Heart disease, cancer, stroke, diabetes, atherosclerosis, and liver disease) . Nutritionists have long believed that a diet high in fruits and vegetables, whole grains and legumes protects against disease and enhances overall health. The recent discovery and identification of phytochemicals in fruits and vegetables statistically supports this belief. Although there is active research focusing on isolating the specific components of these phytochemicals, it is important to remember that it may not be a single ingredient but rather a combination of phytochemicals that give this health benefit. Eating the whole fruit will guarantee that you will miss none of the protection that these whole foods offer.

As scientist continues to study the links between what we eat and our health, they are documenting berries as one of the most significant foods for improving and maintaining a strong body. Sweet and succulent, one cup or more of berries can be a joyful addition into our daily diet. A few berries in yogurt, or a muffin, or perhaps a berry smoothie will provide your daily

amount of anti oxidants and satisfy your sweet tooth. By eating the whole berry you guarantee that you will be getting all the ellagic acid, anthocyanins and vitamin C you need, combined with the fiber and other nutrients that will enable these phytochemicals to do their work. And most importantly, while you are fueling your body and protecting against disease, you will be enjoying a natural and delicious treat.



The Berry Grower's Companion. Barbara L. Bowling has spent most of her professional horticultural career working with and studying berry crops, and has drawn on those experiences to produce a book useful for all berry growers, from novices to commercial operations. She addresses all of the critical issues: historical background of different small fruit, biology, site choice, growing requirements, harvesting information, pests and other problems, and recommended cultivars by region. Her style is warm and readable, and her enthusiasm for these plants is contagious.

Bowling is a former Associate Professor of Horticulture at Penn State University, and an active educator of small fruit growers and enthusiasts, lecturing both regionally and nationally. She currently resides and gardens in Boise, Idaho.

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Western Washington Small Fruit Workshop

Tuesday, December 5, 2000

Homestead Golf & Country Club

115 E Homestead Blvd

Lynden, WA

www.homesteadnw.com

7:30 a.m.-3:40p.m.

presented by Washington State University Cooperative Extension--Whatcom County
call for more information: 360-676-6736



2000-2001 Oregon Raspberry & Blackberry Commissioner List

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*Processor Representatives



Strawberry News



Berries Found to be High in Phytoestrogens

Good news for berry growers; berries have recently been pinpointed as a leading source of compounds thought to produce health benefits for women, due to their high concentrations of phytoestrogens. Phytoestrogens, literally "plant estrogens", have been of interest to the scientific community, because of their possible roll in prevention of both breast and cervical cancer. Studies now indicate that berries may contain some of the highest levels of phytoestrogens. These compounds act as a natural form of estrogen.

In recent studies of the University of Helsinki in Finland, scientists measured eight different berries for their phytoestrogen level, and concluded that blackberries had the highest level of phytoestrogens followed by **strawberries**. All berries tested were a good source of this compound. Australian researchers found that phytoestrogens, such as enterolactone found in soy foods and lignans found in berries and flaxseeds, give women a three-fold **lower** risk of developing breast cancer. This study involved 144 women with breast cancer and a control group

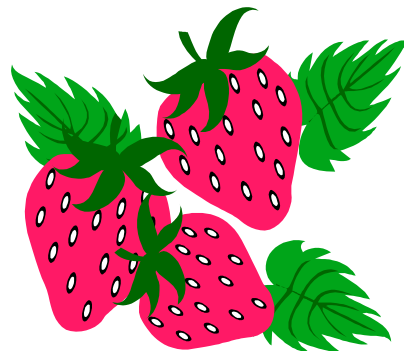
with no cancer. The control group showed consistently higher levels of phytoestrogens than the women with breast cancer. Scientists conclude that a diet high in phytoestrogens would help in fighting the onset of breast cancer.

In the most recent study, scientists at Clemson University in South Carolina, are using berry extracts to inhibit the growth of cancer cells in laboratory tests. The group, led by Dr. Lyndon Larcom, has cultured cancer cells with added berry juice or pulp and examined cell growth. They found that berries significantly inhibit cell growth. They are also examining the effects of berry extract on breast and cervical cancer cells and found similar results especially in the early growth stages of these cells. This study is in its second year and the team of scientists involved hopes to publish their results by next summer.

This information could significantly increase sales and marketing of berries just as the soy industry has been impacted by similar research and marketing strategies. We will keep you updated on current developments, as they become available. For more information or copies of studies and preliminary information call the ORBC office at 541-758-4043.

OSC Needs New Commissioners

The OSC is now accepting applications for two grower position on the commission. If you are a strawberry grower who is interested in the direction of the commission and you have ideas for the future of the OSC and no one to share them with, now is your chance. If you would like to be involved in the commission, please call the OSC office at 541-758-4043 and ask for a commissioner application to be sent to you.



2000-2001 Oregon Strawberry Commissioner List

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Check out this new product in your neighborhood grocery store. One of the first national brands to use black raspberries. We tried it, and we love it! Our only complaint is that there are not enough real berries in it; just essence of black raspberry. However, the flavor is good and nutritional name recognition for black raspberries is great and hope-


**ORBC & OSC Annual
 Growers Meeting
 Info and Registra-
 tion Inside**

fully contagious. And if you like Black Raspberry ice cream, you will love Blue Bunny's Black Raspberry ice cream bar with a chocolate shell. We spotted it at the American School Foodservice Show in St. Louis this summer.