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## Berry Colorful Nutrition News (with recipes)

Janet Raloff

Ah, raspberries. So sweet, so delicate on the tongue, so ephemeral.

Every year, I unsuccessfully defend my raspberries against squirrels, birds, and beetles. As I watch the fruit begin to ripen, so do the neighborhood creatures. Two or three days before the first of those berries are ready to pick, in swarms an armada of marauders, carefully targeting my bounty.



Oregon Raspberry and Blackberry Commission

Most years, I'm forced to purchase fresh, store-bought substitutes and jam.

A new study now suggests that sating my raspberry cravings may have more than a hedonistic payoff: These fragile fruits contain compounds that retard biochemical processes underpinning many degenerative diseases and symptoms of aging.

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*Isolated pigments from the four raspberries tested.*  
Liu/Cornell

four cultivars of raspberries: Heritage, Kiwigold, Goldie, and Anne. The most deeply colored berries tended to have the most healthful attributes. That's useful to know because few berries are identified by name in the marketplace. The researchers will report their findings in an upcoming issue of the *Journal of Agricultural and Food Chemistry*.

### **Banishing free radicals**

Over the past few years, studies have demonstrated the damage that an overabundance of oxidizing chemicals can inflict. These molecular fragments—called free radicals—all lack an electron. Given the chance, each will steal an electron from some nearby molecule. The newly depleted molecule then attempts to recover by stealing an electron itself—thereby setting in motion a potentially catastrophic chain reaction.

Free radicals are extremely damaging to biological material. Indeed, the body unleashes them as one means of killing invaders, such as bacteria, or of removing aging and sick cells. However, such radicals are also one of the primary means by which smog ozone harms the lung.

The body can and typically does unleash antioxidants to keep free-radical chain reactions from getting out of hand. Unfortunately, as people age, the efficiency of that antioxidant-production system drops off. The result: Each oxidant onslaught can do more collateral damage to healthy tissue in an older person than in a younger one.

Research has linked oxidative damage with degenerative diseases—including cancer, diabetes, dementia, cataracts, and the development of artery clogging plaque. In part because of this evidence, supplements of antioxidant vitamins, such as C and E,

have become very popular. However, the data so far don't show that such supplements prevent disease, and most nutritionists recommend that people get their antioxidants from food. Fruits are an especially rich source.

### **Beyond vitamins C and E**

An accumulating wealth of data indicates that many plant pigments are potent antioxidants. In work published 2 years ago, for instance, Liu's team noted that although vitamin C is an important plant antioxidant, it constitutes only about 0.4 percent of an apple's antioxidants. Most of the rest are polyphenols, comprised primarily of flavonoid pigments—especially a class of reddish ones known as anthocyanins.

This piqued Liu's curiosity about raspberries, most of which contain copious anthocyanins.

His team has now tested in the laboratory how well the fruit's polyphenols can defuse oxidation and finds—as expected—that the deeper a berry's color, the higher its anthocyanin content, and the better its antioxidant prowess. In fact, Heritage, Kiwigold, and Goldie are identical raspberries—except for a single mutation in their anthocyanin gene. In other words, the only difference among them is their pigment. Liu notes that they rank number one, two, and three, respectively, in redness—and antioxidant capacity. This result, he says, all but proves that their antioxidant prowess traces to the amount of pigment coloring them. Anne, the golden-hued cultivar, falls far below these in redness and antioxidant power.

A similar trend had emerged in honey. Researchers at the University of Illinois at Urbana-Champaign found that dark, heavily pigmented ones offer far greater antioxidant protection than pale golden ones (SN: 9/12/98, p. 170: [http://www.sciencenews.org/sn\\_arc98/9\\_12\\_98/Bob1.htm](http://www.sciencenews.org/sn_arc98/9_12_98/Bob1.htm)).

### **. . . protection against cancer to aging?**

Liu's group also evaluated how well the berries' polyphenols can shut down the runaway proliferation of cancerous human liver cells that were growing in a test tube. Here, extracts of all the pink-to-red berries performed equally well—and provided more than double the protection offered by the golden Anne.

These findings dovetail with those from a host of other studies suggesting that dietary polyphenols may reduce

cancer risk. For instance, an April 8, 2002, presentation by scientists from Rutgers University and the Shanghai Cancer Institute found that Chinese men who drank tea, which contains polyphenols, faced only about half the risk of stomach and esophageal cancer as those who eschewed the brew. This trend was most pronounced in people who had lower-than-normal blood concentrations of carotenoids—another family of antioxidant plant pigments. The scientists reported the findings in San Francisco at the American Association for Cancer Research annual meeting.

The observation that darker berries perform no better than the pink in this regard may indicate that something other than anthocyanin—perhaps some other polyphenol—is battling the laboratory proliferation of the liver cancer cells, Liu says.

There are also studies of other deeply pigmented fruit, such as blueberries and cherries, that suggest that polyphenols help control inflammation (SN: 4/17/99, p. 247) and preserve animals' motor coordination in old age (SN: 9/18/99, p. 180: [http://www.sciencenews.org/sn\\_arc99/9\\_18\\_99/fob2.htm](http://www.sciencenews.org/sn_arc99/9_18_99/fob2.htm)).

### **Cooked data**

Using raspberries as a health aid is probably impractical because the fruit is seasonal, pricey, and hard to raise in significant quantities. The good news is that a person may not need to consume fresh berries to reap disease-fighting benefits. Liu notes that in preliminary tests, his team finds little or no loss in antioxidant activity when raspberries are cooked—as in baking or jam making.

The recipe that follows will bring deeply hued berries to your dessert plate.

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## **SUMMER TROPICAL MERINGUE TORTE**

Raspberries and blackberries are teamed with tropical fruits in this light summer dessert. Delicately flavored coconut meringues are layered with coconut filling



Oregon Raspberry and Blackberry Commission

and studded with a combo of berries and other fruit. The following directions are compliments of the Oregon Raspberry & Blackberry Commission. The recipe serves 8-10.

## **Ingredients**

### Sauce

(2) 10 oz. packages frozen raspberries in syrup, thawed  
juice of ½ lemon  
1 ½ tablespoons cornstarch

### Meringue

8 large egg whites, room temperature  
½ teaspoon cream of tartar  
1 ¼ cup granulated sugar, divided  
1 cup powdered sugar  
1 ½ teaspoons coconut extract

### Filling

2 cups prepared coconut pudding (see recipe below or use 3 oz. package coconut pudding prepared according to package directions)  
8 oz. light whipped topping, thawed  
3 cups mixed raspberries and blackberries, fresh or whole frozen  
1 banana  
1 small kiwi  
Raspberries and blackberries for garnish

## **Directions**

### Sauce

Strain undrained berries and lemon juice into small saucepan, pressing raspberries through sieve with back of spoon. Add cornstarch to saucepan and blend well. Place over medium heat and bring to a boil, stirring frequently. Boil 1 minute. Remove from heat and allow to cool. (HINT: Pint squirt bottles are helpful tools for storing cooled puree as well as in assembly of finished torte.)

### Meringue

Place oven racks in lower and middle positions and pre-heat oven to 225°. Cut 3 sheets of waxed or parchment paper into approximately 12" squares. Using cake pans, compass, or kitchen bowls as guides, trace three circles, each slightly smaller than the previous one, with

9" being the largest circle. (7", 8" and 9" works well.) Place parchment or waxed paper on baking sheets or on removable tart pan bottoms. Lightly grease paper with cooking spray. Set aside.

Place room temperature egg whites in large mixing bowl and beat on low speed of electric mixer until foamy and white. Sprinkle cream of tartar over surface and continue beating a few more seconds. Gradually sprinkle 4 tablespoons granulated sugar over egg whites while increasing mixer speed to medium, and whip until soft peaks form. Gradually add remaining 1 cup granulated sugar, 2 tablespoons at a time, beating after each addition until sugar is dissolved and meringue feels smooth when tested between thumb and index finger. (If meringue feels grainy, continue beating.) When meringue is smooth and stands up in stiff, glossy peaks, beat in coconut extract. Sift powdered sugar over meringue in two stages and fold in by hand until barely incorporated.

Immediately spoon meringue inside each circle, keeping within the line and shaping with back of spoon to a depth of a little over 1". Bake 2 hours, rearranging baking sheets after 1 hour so that the lower baking sheet is in middle position, and middle sheet in lower position. After 2 hours, meringues will be firm and ivory-to-champagne color. (If meringues begin to turn tan or darker during baking, temperature is too high and should be reduced.) Turn off oven and let meringues stand in oven for 20-30 minutes.

Remove baking sheets from oven and allow meringues to remain on parchment for 20-30 minutes, until cool. At this point, if wrapped in plastic freezer bags and stored in airtight containers, meringues will keep for two weeks.

#### Filling and Assembly

Fill and assemble about ½ hour before serving to soften meringues slightly. When ready to serve, fold light whipped topping into coconut pudding. Spread about 1 cup of coconut filling over largest meringue disk. Spoon raspberry sauce in decorative lines over filling. Sprinkle liberally with berries and sliced banana. Repeat these steps with remaining disks, using smaller amounts of filling each time, and ending with smallest disk. Garnish with berries and kiwi.

#### NUTRITIONAL ANALYSIS:

Calories/serving: 399; 4.23 g protein, 10.4 g fat, 72 g carbohydrate; 45.3 mg sodium; 96.6 mg cholesterol

## COCONUT PUDDING

A perfect accompaniment to the tropical torte here, or served simply with berries and a brightly colored Raspberry Sauce. Recipe serves 4-6. (If using packaged coconut pudding, prepare according to directions for pie filling, then cover and cool.)

### Ingredients

One 14-oz. can light coconut milk  
4 egg yolks  
¼ cup sugar  
¼ cup cornstarch  
1 tsp. coconut extract  
½ cup processed sweetened coconut

### Directions

Scald coconut milk.

Whisk egg yolks, sugar, and cornstarch together in a bowl. Add half of the hot coconut milk and then continue to whisk. Add remaining hot milk and stir to insure smoothness.

Transfer to double boiler and cook slowly, stirring constantly at medium-low temperature. NEVER BOIL. Mixture will thicken and coat spoon when done. Fold in coconut, then pour into a small bowl and cool at room temperature, stirring occasionally to release steam.

When cool, cover and refrigerate.

May be made 2 days ahead.

Credit: Oregon Raspberry and Blackberry Commission

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