Discover the Health Benefits of the Cranberry – *Part 1*

Mother Nature's Anti-Adhesion Fruit and More!

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Contents

Introduction: The Cranberry 5

History of the Cranberry 7

Cranberries Offer a Supermarket of Antioxidant Compounds 8

What is an Antioxidant? 8

What are Anthocyanins? 10

Cranberries Help Fight Urinary Tract Infections 11

How the Cranberry Prevents Bacteria From Sticking? 12

Cranberry Juice Alters the E. Coli Membrane 12

Cranberries and Healthy Teeth and Dental Health 13

Cranberries Help to Fight LDL (bad) Cholesterol 14

Cranberries Help to Fight Kidney Stone Formation 15

Cranberries Help to Fight the Herpes Virus 15

Ten Ways to Incorporate Cranberries into Your Daily Route 16

Great Tasting Cranberry Recipes 17

Sea Breeze 17

Cranberry, Crab Meat and Cream Cheese Appetizers 18

Cranberry Mustard Dipping Sauce 18

Bonus: Flax At-a-Glance: A Quick Overview of the Natural Health Benefits of Flax 19

Flax Helps to Fight Menopausal Symptoms 19

Flax Helps to Fight Inflammation 19

Flax Helps to Fight Constipation 19

Flax Helps to Fight Cholesterol 20

Cranberry Supplements and Cranberry Products 20

Resource Page: 22

Sources for Cranberry Products: 22

Sources for Additional Information on Antioxidants, Anthocyanins and Fruit: 22

References 22

Introduction: The Cranberry

The cranberry has a long history of fighting urinary tract infections, fighting the dental health issues and being an excellent source of anti-oxidants and more, naturally. For decades, stories of the urinary tract benefits of the cranberry have been the source of legend and folklore. For many urinary tract suffers, the cranberry is considered "Mother Nature's urinary tract fighter". In addition, the cranberry is also being called the natural anti-adhesion fruit.

Many of the world's leading research organizations are studying this little fruit with amazing results. These studies are funded by research universities, private companies and public grants. So interest in its urinary tract fighting ability and the anti-adhesion capability of the cranberry includes more than a small group of naturalists, it also includes the smartest and most educated individuals in food research.

This special report will introduce you to the antioxidant-rich properties of the cranberry. Ongoing research from medical universities suggests cranberries may…

- Provide the body with high levels of ORAC units
- Help fight urinary tract infections
- Help fight bad cholesterol
- Help maintain healthy teeth and dental health
- Help fight the herpes virus

Like many foods, cranberries are a natural source of a broad range of anti-oxidants. However, the unique makeup and combination of the anti-oxidants in cranberries are what make this tiny fruit so special. Cranberries are a very good source of dietary fiber and are an excellent source of Vitamin C, flavonoids, anthocyanins, including proanthocyanidins and are a good source of manganese and vitamin K. Cranberries offers very good vitamin C and fiber values.

But before we go any further, let's take a closer look at some of the nutritional information a ½ cup of cranberries:

Cranberries
0.50 cup
47.50 grams
23.27 calories

Nutrient	Amount	DV (%)	Nutrient Density	World's Healthiest Foods Rating
vitamin C	6.41 mg	10.7	8.3	excellent
dietary fiber	1.99 g	8.0	6.2	very good
manganese	0.07 mg	3.5	2.7	good
vitamin K	2.42 mcg	3.0	2.3	good

Source: U.S. Food and Drug Administration's "Reference Values for Nutrition Labeling."

History of the Cranberry

The cranberry has an interesting history since it is only one of three fruits native to North America. The other two native fruits are concord grapes and blueberries. The cranberry was a staple of Native Americans for a tasty ingredient for all types of meals. In addition, the cranberry was used as a dye for blankets, rugs and even used as an ingredient to treat arrow wounds.

The Native Americans taught the early settlers the secrets of the cranberry. The cranberry received it name from the "crane berry" because the plants appearance is a slender and downward hanging blossom resembling the head and neck of the crane. Over time the word was shortened to "cranberry".

The commercial cultivation of the cranberry began in 1816 in Cape Cod, Massachusetts by Captain Henry Hall. The captain noticed the cranberries in his bogs grew better when sand blew over the cranberry bogs. After noticing this, the captain began spreading sand on his wet bogs. This technique was quickly copied and was used by a number of budding cranberry farms, thus the cranberry industry was born.

Cranberry vines grow in beds layered in sand and peat. These growing areas are called bogs. Cranberries are harvested by using two methods – wet and dry.

Dry harvested cranberries are sold as fresh fruit and the fruit is "combed" off the vine by mechanical machines. Wet harvested cranberries are harvested by flooding the bogs with water and using mechanical harvesters to agitate the water. This causes the cranberries to disconnect from the vine and float to the top. Once these newly dislodged cranberries are floating atop the water, there are collected into trucks. Wet harvested berries are used to produce sauce, juice and dried cranberries.

Cranberries Offer a Supermarket of Antioxidant Compounds

The good news about cranberries and their natural anti-adhesion benefits just keeps coming. Medical schools and research universities continue to publish more evidence showing the amazing health benefits of this tiny red fruit.

What is an Antioxidant?

An antioxidant is defined as "various substances (as beta-carotene, vitamin C, and alpha-tocopherol) that inhibit oxidation promoted by oxygen and peroxides and may help to protect the body from the effects of free radicals."

In other words, antioxidants deactivate free radicals in the body. Thousands of studies have repeatedly shown that maintaining high levels of antioxidants helps to reduce a person's risk for disease, stimulates the immune systems and may even slow the aging process. So what is a free radical?

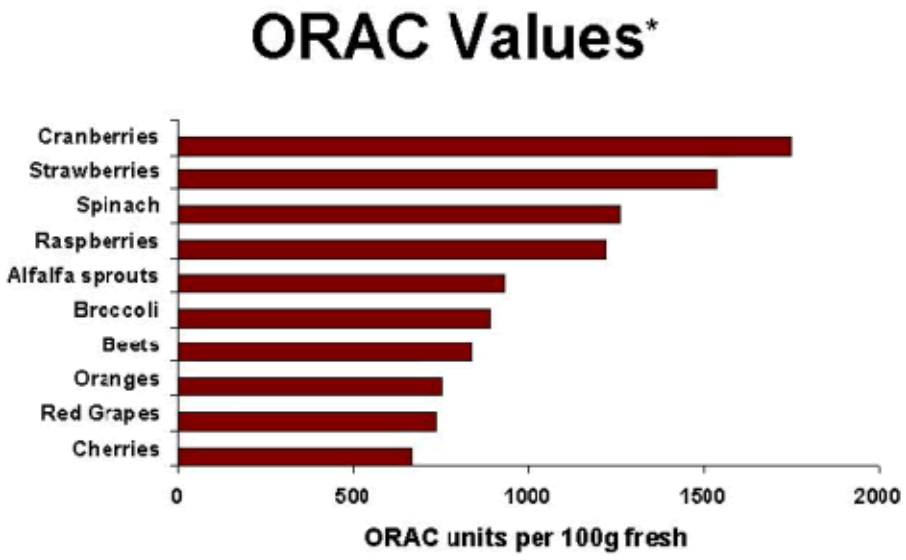
Free radicals are unstable molecules that have lost an oxygen molecule. These unstable molecules steal oxygen molecules from healthy cells. One example of the affects of free radicals on healthy cells is the browning of a freshly cut apple or potato.

If you have ever cut an apple or a potato and let it set on the counter for 20 minutes you have witnessed the affects of free radicals on healthy cells. The browning of the exposed fruit is what is called "cellular rust" and this is similar to what occurs in the body. Antioxidants fight these free radicals. That is why it is vital to eat a healthy diet and food that is high in ORAC value.

ORAC or Oxygen Radical Absorption Capability measures the total antioxidant value of different foods. ORAC values indicate how many free radicals a specific food can absorb and deactivate. (OU 2001). The more free radicals a food can absorb the higher its ORAC value score.

Thus, the higher the score, the better the food is in helping the body to fight disease and stay healthy.

Nutrition experts estimate that the body needs a daily consumption of 3,000 to 5,000 ORAC units to reach significant oxygen capacity in the blood and realize the health benefits of ORAC in food. In fact, according to the USDA-Agricultural Research Service the ORAC value of the cranberry surpassed raspberries, beets, red grapes and even strawberries.



* Source: USDA-Agricultural Research Service

What are Anthocyanins?

Anthocyanins are responsible for giving nature its vibrant colors. Anthocyanins are present in every fruit and vegetable that has color. You can see the overwhelming presence of this pigment when you visit an orchard or the fresh produce section of your local grocery store. Anthocyanins are present in blueberries, cherries, strawberries, apples, and red raspberries to name a few. In addition, anthocyanins are the phytochemicals responsible for changing the colors of the leaves during the autumn months from green to fiery red, orange, purple, yellow and more.

Anthocyanins have long been the study of botanists due to their phytoprotective capabilities. To date, over 300 distinct types of Anthocyanins have been identified. Based upon research, Anthocyanins belong to one class of flavonoids. Flavonoids include a number of different classes including flavones, flavonones, flavon-3-ols and flavonols to name a few. Different classes of flavonoids have different oxidations states. Thus, from an oxidative standpoint, different fruits and vegetables offer different oxidative degrees or ORAC values.

So stay health and help your body fight offer the harmful affects of free radicals you need to consume high ORAC foods including cranberries.

Cranberries Help Fight Urinary Tract Infections

A urinary tract infection (UTI) afflicts both women and men, so for those who have suffered this unpleasant experience, the cranberry is a welcome natural solution. Many do not want to take prescription medication due to personal choices and the potential for unhealthy side efforts. Cranberries help to reduce UTI's.

According to research cranberries contain proanthocyanidins. These inhibit adhesion of bacteria to the bladder itself. This compound prevents Escherichia coli (E. coli) from sticking to the walls and reproducing, thus greatly reducing the occurrence for an infection. It is the proanthocyanidins that are the secret agents of the cranberry to prevent a urinary tract infection UTI.

"The cranberry's proanthocyanidins are structurally different than the proanthocyanidins found in other plant foods tested, which may explain why cranberry has unique bacterial antiadhesion activity and helps to maintain urinary tract health" said Dr. Amy Howell, a researcher at Rutgers University.

In 1998, Dr. Amy Howell first reported the anti-adhesion properties of the cranberry. In addition, according to presentations at the 2002 Experimental Biology conference it was reported that a single eight-ounce glass of cranberry juice prevented E. coli from sticking to the walls of the bladder of six volunteers. [1] The proanthocyanidins found in cranberries not only inhibits bacteria from adhering to the bladder, but this anti-sticking benefit can last up to 10 hours after consumption. [2]

How the Cranberry Prevents Bacteria From Sticking?

The latest of a series of studies presented in September 12, 2006 at the American Chemical Society tells the story of how the cranberry helps to prevent bacteria from sticking. This ground-breaking research was conducted by Terri Camesano from Worchester Polytechnic Institute. The research showed that the compounds in cranberry juice have the ability to actually alter E. coli bacteria and to prevent them from causing a urinary tract infection.

E. coli can be responsible for a whole host of health related issues including kidney infections, urinary tract infections, tooth decay and gastroenteritis. The agent responsible for attacking and changing the E. coli are a group of tannins called proanthocyanidins. Once altered the changed E. coli may be prevented from adhering to the cells in the body. Adhesion is the first step in any sort of infection taking shape in the both. If you can prevent adhesion, you may be able to prevent infection.

Cranberry Juice Alters the E. Coli Membrane

In the February 2006 edition of *Biotechnology and Bioengineering*, a published article from Camesano showed that E. coli fimbriae that were exposed to cranberry juice become compressed. Fimbriae are tiny tendrils on the outer membrane of certain types of E. coli bacteria that is most responsible for the urinary tract infections. Since the fimbriae is compressed this prevents it from binding tightly to the urinary tract, thus greatly reducing its ability to remain in place long enough to begin a UTI.

Additional research from Camesano indicates that cranberry juice can transform E. coli in even more radical ways than previously understand. In a study conducted on bacteria grown in various environments of either cranberry tannins or cranberry juice, the E. coli bacteria actually transformed behavior from a gram-negative to exhibiting gram-positive behavior. E. coli is normally a gram-negative rod-shaped bacterium, however when it was exposed to the cranberry environment, it transformed into a spherical-shaped bacterium and exhibited behavior of a gram-

positive bacteria. Since positive and negative bacteria differ primarily in structure the results suggest that the cranberry can alter E. coli's membrane.

In addition, Camesano also presented preliminary findings that when E. coli is exposed to cranberry juice, the E. coli loses its ability to secrete indole. Indole is a molecule that is involved in bacterial communication called quorum sensing. This communication is used by the E. coli to determine if enough bacteria are present to launch a successful infection attack. If the E. coli can't communicate, it may not be able to launch an attack on the body.

Cranberry Juice Creates an Energy Barrier to Help Fight Bacteria

In the August 2006 edition of *Colloids and Surfaces*, Camesano published that cranberry juice can create an energy barrier that prevents bacteria from getting close the urinary tract walls. This natural force field actually prevents these tiny organisms from adhering in the first place.

Cranberries and Healthy Teeth and Dental Health

Healthy teeth and positive dental health is vital not only for a positive social encounters but for maintaining a healthy body and lifestyle. Dental plaque can contribute to a whole host of health issues including bad breath, heart issues and more. Plaque is composed primarily of bacteria that can attach to the gums and teeth. In addition the attaching the teeth and gums, oral bacteria also attaches to other bacteria in the mouth thus forming a colony of bacteria in the mouth.

Cranberry juice has a unique component referred to as a high-molecular-weight nondialysable material (NDM). This NDM has the ability to inhibit and reverse the colonization of certain oral bacteria that is responsible for periodontal disease and dental plaque. [3]

Dental plaque is the result of oral bacteria that has attached itself to the gums and teeth. As you know, plaque soon becomes very hard. In addition, plaque may comprise of hundred of species of bacteria and can be resistant to salvia and brushing. Once the bacterium hardens, it is your

dentist's job to scrape the plaque off with highly specialized dental tools. Dental plaque can be a major cause of periodontal disease. [4]

Cranberries amazing anti-adhesion ability not only prevent bacteria from sticking to the walls of your bladder, it also helps oral bacteria from sticking to your teeth and gums.

Cranberries Help to Fight LDL (bad) Cholesterol

Research from the University of Scranton, indicates that cranberries can help to decrease levels of LDL (bad cholesterol) and total cholesterol. These research results have been be shown on both test tube results and in human studies.

The results of the study were presented at the 225th meeting of the American Chemical Society. The research was funded by the U.S. Cranberry Institute. The study showed the results of the cholesterol levels of 19 participants in the study. The research measured the cholesterol levels of the subjects with high cholesterol. Ten of the participants were given cranberry juice with an artificial sweetener, while the remaining was given no added sugar cranberry juice. Each study participant drank one 8-ounce glass of cranberry juice a day for the first month, then the subjects were instructed two drink two glasses for the next month and finally three glasses for the third and final month. The research subjects were not monitored nor baseline measured for exercise, diet or alcohol consumption.

The study results indicated HDL (good) cholesterol increased by an average of 10% after drinking three glasses of cranberry juice per day. However, no changes were recorded in changes to overall cholesterol levels.

Cranberries Help to Fight Kidney Stone Formation

Cranberries are a natural source of quinic acid. This is an acidic compound that is not broken down in the body but is excreted in the urine, unchanged. The quinic acid causes the urine to become just acidic enough to prevent calcium and phosphate ions from joining together and forming insoluble kidney stones.

In one study conducted on cranberry juice and kidney stones, the subjects of the study were divided into two groups. The first group drank 2 cups of cranberry juice for two weeks that was diluted with 6 cups of water, while the second group drank tap water for the same period. After the initial period, the groups were switched in which the subjects that drink tap water began drinking cranberry juice, while the cranberry juice drinkers began drinking tap water for an additional two weeks. In both groups, those drinking cranberry juice were found to have significantly and uniquely urinary factors: citrate excretion increased, oxalate and phosphate excretion decrease and super saturation of calcium oxalate was measured and the results were significantly lower.

Cranberries Help to Fight the Herpes Virus

Cranberries are Mother Nature's Anti-adhesion fruit. Similar to its ability to protect against UTI by prevent bacteria from sticking to the bladder walls, the proanthocyanidin A-1 compound found in cranberries may help fight the herpes virus. These results were published in the October 2004 issue of the *Journal of Science, Food and Agriculture.* The study showed that the cranberry may also effective in combating the herpes simplex virus (HSV-2), the cause of genital herpes. Although this research was not conducted on humans, the results are certainly promising and we are looking forward to studies involving human subjects

Ten Ways to Incorporate Cranberries into Your Daily Route

Due to today's active and hectic lifestyles, incorporating cranberries into your daily diet may seem difficult. However, here are a ten simple ways to enjoy the natural health benefits of cranberries everyday:

1. *Straight from the Bag* – Buy single serve dried cranberries or 8 oz. dried cranberry bags and keep them in your office drawer or purse for a quick healthy snack.
2. *Cranberries on the Run* – Add an ounce of cranberry juice concentrate to your water bottle and shake. This will make a 100% pure and refreshing cranberry drink to enjoy while biking, driving or walking.
3. *A Fruity Parfait* – Mix some granola and yogurt with frozen cranberries for tasty snack.
4. *Blend It* – Add some ice, wheat germ, a banana, cranberry juice concentrate and a dash of low-fat milk and start the day off right with a cool, anti-oxidant rich smoothie.
5. *Breakfast Additions* – Add a handful of dried cranberries to your favorite cereal or oatmeal.
6. *Cranberry capsules*- Cranberry capsules are a great way to get to the anti-oxidant benefits of this superfruit. They are convenient, easy-to-travel and they don't need refrigeration.
7. *Make a Cranberry Salad* – Add some tasty dried cranberries to your favorite salad and taste the cranberry difference.

8. *Dinner Additions* – Dried cranberries make a great addition to couscous, rice pilaf and pasta.

9. *Cookies and Desserts* – Chop up some dried cranberries and add them to muffins or cookies.

10. *Sprinkle Away* – Sprinkle cranberry powder on all types of food for both a yummy cranberry taste and a meal rich in anti-oxidants. Cranberry powder is very versatile.

Great Tasting Cranberry Recipes

Source: www.oceanspray.com

Below are some great tasting cranberry recipes for you to taste and sample.

Sea Breeze

INGREDIENTS:
3 ounces Ocean Spray® Cranberry Juice Cocktail, chilled
3 ounces Ocean Spray® 100% White Grapefruit Juice
1 1/2 ounces Absolute® Vodka

DIRECTIONS:
Pour all ingredients into a tall glass filled with ice.
Makes 1 serving

Ultimate Party Meatballs

INGREDIENTS:
2 1-pound bags frozen pre-cooked cocktail-size meatballs (about 64 meatballs)
1 16-ounce can Ocean Spray® Jellied Cranberry Sauce
1 12-ounce bottle Heinz® Chili Sauce

DIRECTIONS:
Combine cranberry sauce and chili sauce in a large saucepan. Cook over medium heat, whisking occasionally, until the cranberry sauce is melted and smooth.

Add meatballs; stir gently to coat. Cook over medium-low heat, stirring occasionally, 12 to 15 minutes or until meatballs are heated through. Place in chafing dish or slow cooker to keep warm.

Tip: To spice it up even more, add a teaspoon of cumin and a 1/4 teaspoon of cayenne to the sauce while it is cooking.

Cranberry, Crab Meat and Cream Cheese Appetizers

INGREDIENTS:
1/2 cup Ocean Spray® Whole Berry Cranberry Sauce
1/3 cup cream cheese, softened
1/4 cup minced crab meat
2 tablespoons green onion, white and green parts, sliced
15 individual mini-phyllo shells, thawed

DIRECTIONS:
Preheat oven to 375ºF. Place cranberry sauce in a small mixing bowl; beat with a fork or wire whisk until smooth.

Combine cream cheese, crab meat and green onion in a small mixing bowl. Fill each shell with about 1 teaspoon of the cream cheese mixture. Top with 1/2 teaspoon cranberry sauce.

Bake for 10 minutes or until heated through.
Makes 15 individual servings.

Cranberry Mustard Dipping Sauce

INGREDIENTS:
1/2 cup Ocean Spray® Jellied Cranberry Sauce
1 1/2 tablespoons grainy Dijon mustard
1 tablespoon brown sugar

DIRECTIONS:
Combine ingredients in a small mixing bowl, whisking until smooth. Serve hot or at room temperature as a dip with chicken, ham, pork or shrimp.

Makes 1/2 cup.

Bonus: Flax At-a-Glance: A Quick Overview of the Natural Health Benefits of Flax

Flax Helps to Fight Menopausal Symptoms

Flax is a natural source of phytoestrogen. Research indicates that phytoestrogen sources can help fight menopause. This compound helps to stabilize hormonal levels and can act as natural hormone therapy. In fact, flax is the richest known plant source of natural phytoestrogen.

Flax Helps to Fight Inflammation

Inflammation in the body can at times be a precursor to more serious health issues including disease.

Flax is a good source of Omega 3 essential fatty acids. A number of leading health expects recommend eating foods high Omega 3 for people suffering from rheumatoid arthritis including former Surgeon General C. Everett Koop. In addition, the January 1996 issue of *American Journal of Clinical Nutrition* published a study that used flax oil to determine anti-inflammatory benefits. According to the article the participants who took flax oil daily experienced reduced inflammatory responses by as much as 30%.

Flax Helps to Fight Constipation

Flax is a good source of both insoluble and soluble fiber. One ounce of flax provides 32% of the USDA's recommended daily intake of fiber. Fiber helps to promote regular bowel movements. Flax fiber helps to absorb water, thus softening the stool and allowing it to pass through the colon quickly. In addition to take flax and flaxseed, you should drink 8 glasses of water per day and eat plenty of fruits and vegetables. This will assist with proper bowel movements and fight constipation.

Flax Helps to Fight Cholesterol

Flaxseed is associated with the reduction of total cholesterol. This includes triglycerides and the bad (LDL) cholesterol. Flaxseed has an impressive history of showing positive results of eating flaxseed daily and a reduction in cholesterol. In addition the taking flaxseed, you should limit your intake of sugar, salt and exercise on a daily basis.

Cranberry Supplements and Cranberry Products

The cranberry offers a number of different ways to enjoy its health benefits including dried cranberries, cranberry juice concentrate, cranberry capsules and more. Below are the many different types of cranberry products available.

- **Fresh Cranberries:** When in season, you can get fresh cranberries straight from the farmers market or the produce section of your local store. Unfortunately, fresh cranberries are only in season for a few short weeks during the harvest. Thus, finding fresh cranberries may be very difficult.

- **Frozen Cranberries:** Enjoy a few thawed cranberries in your pancakes or muffins. To get your hands on frozen cranberries visit the refrigeration section of your local grocery store. However, it may be difficult to find frozen cranberries due to the fact they are not a widely popular product for grocery and gourmet stores.

- **Canned Cranberries:** Canned cranberries can be found in your local grocery store. They usually most popular during the holiday season. Check with the local grocery store manager for availability.

- **Dried Cranberries:** A handful of dried cranberries make a great healthy snack or an addition to your morning cereal. They also make a good alternative to the candy in the candy jar next to your computer. Remember a ½ cup of dried cranberries delivers nearly 1900 ORAC units and 8% of the recommended daily allowance of fiber. Dried cranberries make a great choice

since they are available year round. One source for dried cranberries is Traverse Bay Farms www.traversebayfarms.com The Company will ship dried cranberries directly to your home or office.

- **Cranberry Juice:** Remember research indicates ORAC helps the body to fight free radicals, disease and may even help the aging process. Cranberry juice is an ideal way to get the natural health benefits of this purple fruit. Ocean Spray www.oceanspray.com is also a good source for cranberry juice. Also, check out your local grocery store for cranberry juice.

- **Cranberry Capsules:** Cranberry capsules are the most convenient and easiest way to get the natural health benefits of the cranberry. When buying cranberry capsules make sure they are a whole cranberry supplements. A whole cranberry supplement uses the entire cranberry, including the skin and the pulp of the fruit. By using the whole cranberry you are getting the synergistic benefits of the whole cranberry. A good source for whole cranberry capsules is Fruit Advantage www.fruitadvantage.com Fruit Advantage also offers a supplement that combines cranberry with flaxseed. In fact, this the first supplement to combine cranberry with flaxseed in a capsule format. The name of the innovative product is call Fruit Advantage Women's Formula and has been available for the last few years.

- **Cranberry Powder:** Cranberry powder is used to make the cranberry supplements. Only a few companies sell cranberry powder, so it is difficult to find. However, Fruit Advantage offers cranberry powder for purchase. Contact them at www.fruitadvantage.com

Resource Page:

Sources for Cranberry Products:

Fresh Cranberries: Your local grocery store, farmers market or Thompson Cranberry Orchards

Cranberry Juice: Ocean Spray www.oceanspray.com

Canned Cranberries: Your local grocery store

Cranberry Capsules (capsules): Fruit Advantage www.fruitadvantage.com

Cranberry Juice Concentrate: Traverse Bay Farms www.traversebayfarms.com

Frozen Cranberries: Your local grocery store

Dried Cranberries: Traverse Bay Farms www.traversebayfarms.com

Sources for Additional Information on Antioxidants, Anthocyanins and Fruit:

American Heart Association – www.americanheart.org

American Medical Association – www.ama-assn.org

Center for Disease Control – www.cdc.gov

Food with Benefits – www.foodwithbenefits.com

Fruits and Vegetables Matter – www.fruitsandveggiesmatter.gov

Orchard of Health – www.orchardofhealth.com

5 Day Program - www.5aday.gov

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1 – Experimental Biology Conference 2002

2 - June 19, 2002 edition of the *Journal of the American Medical Association*

3 - Weiss EI, Lev-Dor R, Kashamn Y, Goldhar J, Sharon N, Ofek I. Inhibiting interspecies coaggregation of plaque bacteria with a cranberry juice constituent. JADA, 1998. 129:1719-1723.

4 - Critical Reviews in Food Science and Nutrition (2002)