



Tart Cherry Report

How to Maintain Healthy Joints* and
a Healthy Cardiovascular System*



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Tart Cherry Health Report

Traverse Bay Farms Tart Cherry Health Information and Cherry Recipes

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We would like to thank CMI as the source for the recipes in this special tart cherry report.

This is Version 1 of Tart Cherry Report by Traverse Bay Farms:

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Introduction: The Tart Cherry



The tart cherry has a long history of offering natural health benefits. The tart cherry has traveled the world from Asia to Europe and finally to the new world. The cherry has pleased the palates of food lovers for centuries. Its ruby-red color and tangy taste won cherries a place on the tables of Roman conquerors, Greek citizens and Chinese noblemen. Cherries were ultimately, brought to America aboard ships by early settlers in the 1600s.

After the cherry arrived in the new world it spread across the country and several states boast commercial cherry crops including New York, Wisconsin, Utah, Washington and Michigan. In fact, Northwestern Lower Michigan is known as the “Cherry Capital of the World”. This section of Michigan produces approximately 60% of U.S. tart cherry production.

In 1852, Mr. Dougherty, a Presbyterian missionary living in Northern Michigan, planted the first tart cherry tree on Old Mission Peninsula



Much to the surprise of the other farmers and Indians who lived in the area, Dougherty's tart cherry farm and trees

flourished and soon other residents of the area started their very own cherry farms. The area proved to be ideal for growing cherries because Lake Michigan tempers Arctic winds in winter and cools the orchards in summer.

The first official commercial tart cherry orchards in Michigan were planted in 1893 on Ridgewood Farm near the site of Dougherty's original plantings. By the early 1900s, the tart cherry industry was firmly established in the state with orchards not only in the Traverse City area, but all along Lake Michigan from Benton Harbor to Elk Rapids. Soon production surpassed

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other major crops. The first cherry processing facility, Traverse City Canning Company, was built just south of Traverse City, and the tart cherry fruit was soon shipped to Chicago, Detroit and Milwaukee.

The Natural Health Benefits of the Tart Cherry

The tart cherry offers a number natural nutrients and health benefits. For decades the tart cherry has been to subject of folklore and legend. The amazing stories of it natural health benefits being passed down from generation to generation, from grandfather to grandson and from mother to daughter.

In addition, many of the world's leading research organizations are studying this ruby red fruit with amazing results. These studies are being funded by research universities, USDA grants, private companies and public grants. So thanks to an ever increasing number of published research papers and published studies, all of those the legends and folklores now seem to have a large amount of fact.

This special report will introduce you to the antioxidant properties and health benefits of the tart cherry. Ongoing research from medical universities suggests tart cherries may...

- Provide the body with high levels of ORAC units
- Helps maintain healthy joint function*
- Helps maintain a healthy cardiovascular system*
- Helps maintain healthy sleep patterns*

Like many foods, tart cherries are a natural source of a broad range of antioxidants. However, the unique makeup and combination of the antioxidants in tart cherries are what make this tiny fruit so special. Tart cherries are a source of fiber, potassium, beta carotene, melatonin, flavonoids, anthocyanins and more.

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In addition, when comparing tart cherries to other types of fruit, the tart cherry offers outstanding nutrient values. For example, frozen tart cherries are higher in beta carotene and thiamin than frozen blueberries and strawberries. The levels of vitamin A and beta carotene are 19 times higher than these same two frozen fruits. (I have included a complete chart below for your review)

But before we go any further, let's take a closer look at the nutritional information for several different types of tart cherry products:

Nutritional Information on Select Tart Cherry Products

A daily serving (1/4 cup – 45g) of dried tart cherries provides the following:

- 138 Calories
- 4.55 g protein
- 28.9g Carbohydrates
- .23g Fat



A daily serving (1 oz. – 28.3g) of tart cherry juice concentrate

- 74 Calories
- .92 g protein
- 17.5g Carbohydrates
- 0g Fat

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A daily serving (1/2 cup – 67g) of frozen tart cherries

- 28 Calories
- .65 g protein
- 6.35g Carbohydrates
- .4g Fat

A daily serving (1/2 oz. – 121g) of canned tart cherries

- 37 Calories
- .90 g protein
- 8.13g Carbohydrates
- .07g Fat

* Nutritional analysis conducted by the American Analytical Chemistry Laboratories Corporation

Selected Nutrients in Tart Cherries Compared to Other Fruits

Select Fruit (100 grams)	Vitamin A IU	Beta Carotene MCG	Vitamin B6 MG	Thiamin MG	Iron MG	Potassium MG
Tart Cherries Frozen	870	522	.067	.044	.53	124
Watermelon Raw	569	303	.045	.033	.24	112
Peaches Raw	326	162	.025	.024	.25	190
Blueberries Frozen	46	28	.059	.032	.18	54
Strawberries Frozen	45	27	.028	.022	.75	148
Raspberries Raw	33	12	.055	.032	.69	151
Oranges Raw	225	71	.060	.087	.10	181

Source: USDA National Nutrient Database

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What is an Antioxidant?

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

In other words, antioxidants may deactivate free radicals in the body. Thousands of studies have repeatedly shown that maintaining high levels of antioxidants helps to maintain a healthy body and a healthy lifestyle. 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. 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 stay healthy.

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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.

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 oxidation states. Thus, from an oxidative standpoint, different fruits and vegetables offer different oxidative degrees or ORAC values.

Tart Cherries Offer a Number of Antioxidant Compounds



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

Research shows tart cherries have at least 17 naturally occurring compounds that offer an entire range of healthy benefits.

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According to an article published in 2006 in the *American Journal of Clinical Nutrition* the tart cherry ranked 14 of the top 50 foods in a study for total ORAC contact per serving – the ORAC value of the tart cherry surpassed red wine, orange juice, prune and even dark chocolate.

Cherry Product	ORAC (units per serving)
Frozen Cherries – ½ cup	1,362
Dried Cherries – ¼ cup	3,060
Cherry Juice Concentrate – 1 oz.	3,622

*Research conducted at Jean Mayer USDA Human Research Center on Aging and Brunswick Laboratory

Quantity of Melatonin Identified in Cherries

The University of Texas Health Science Center recently began to quantify the availability and activity of the melatonin in cherry products. Melatonin is a potent antioxidant for which there is extensive evidence showing it to be significant in improving the body's circadian rhythms and natural sleep patterns.

In their preliminary work, Dr. Russel Reiter and Dr. Dun-xian Tan used radioimmunoassay (RIA) and high performance liquid chromatography with electrochemical detection (HPLC-EC) to identify substantial levels of melatonin in tart cherry juice concentrate. The amount of melatonin found, says Dr. Reiter, "is extremely significant." Although melatonin is found in the body in extremely small quantities, slight increases in melatonin levels can produce very positive results.

Researchers are now working to determine the amount of active melatonin available to the human body after the consumption of tart cherry juice or other cherry products. Once identified, researchers will be able to calculate the optimum level of cherries that should be consumed to achieve the greatest health benefit. Dr. Reiter points out, "as we age, the human body's ability to

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produce melatonin decreases," so it may be beneficial to find a way to increase melatonin levels, particularly for the elderly. Including cherries as part of a healthy diet could be a way to do this.

Cherries: The Healthy Fruit

The good news about the health benefits of cherries continues to increase. According to ongoing research, Montmorency tart cherries are a rich source of antioxidants. In addition, there are beneficial compounds in Montmorency tart cherries that may help maintain healthy joint function.

Other fruits and vegetable do not have the unique anthocyanin and antioxidant makeup similar to those of tart cherries.

While the research on the exact mechanisms that give cherries their unique ability to maintain healthy joint function, many consumers are discovering that tart cherry juice and other cherry products can help maintain an active lifestyle.

Research also shows that tart cherries are a rich source of powerful antioxidants, including kaempferol, quercetin and melatonin. Melatonin is a powerful antioxidant considered more potent than vitamins C, E, and A, because it is soluble both in fat and water.



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Cherries and a Healthy Cardiovascular System*

Cherries are packed with powerful health-promoting properties. Research indicates tart cherries contain at least 17 natural compounds including beta carotene, vitamin A, Melatonin and phenol compounds known as flavonoids.

Studies suggest flavonoids help promote cardiovascular health*. Some of the specific flavonoids in cherries include anthocyanins, proanthocyanins and anthocyanidins. Anthocyanins are naturally occurring compounds that give fruits, vegetables and plants their vibrant color. Tart cherries are a good source of these vital flavonoids.

Brunswick Labs located in Wareham, MA discovered that tart cherries also contain a class of compounds called SOD (super oxide dismutase), which act as super scavengers of dangerous free radicals throughout the body. Very few foods contain SOD and the human body is often lacking in SOD

New Research Shows the Power of Cherries

Recently published research conducted at Michigan State University (1) investigated a range of fruits and berries for the level and activity of anthocyanins found in each.

Researchers analyzed the ability of the fruits to help maintain a healthy body and act as antioxidants to destroy free radicals. The researchers then quantified the anthocyanin levels of tart and sweet cherries, raspberries, strawberries, blackberries, blueberries, cranberries, elderberries and bilberries.

Researchers discovered that the antioxidant activity of anthocyanins from cherries was superior to vitamin E at a test concentration of 125 g/ml.

Anthocyanins 1 and 2 are present in both cherries and raspberries. The yields of pure anthocyanins 1 and 2 in 100 g in cherries and raspberries were the highest of the fruits tested at

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26.5 and 24 mg, respectively. Fresh blackberries and strawberries contained only anthocyanin 2 at a total level of 22.5 and 18.2 mg/100 g, respectively; whereas anthocyanins 1 and 2 were not found in bilberries, blueberries, cranberries or elderberries.



The "Dean of Melatonin Research" Gives Tart Cherries High Marks

Dr. Russel Reiter never envisioned that he'd become a hero to U. S. tart cherry growers, but then again, he never imagined that melatonin, the simple, natural hormone he'd been studying for years would be found in such significant quantities in tart cherries.

"We were surprised at how much melatonin was in cherries, specifically the Montmorency variety," says Reiter. The only other fruits that have been examined to date are bananas and pineapples, and both have comparatively low melatonin levels. "Cherry juice concentrate, which involves greatly reducing the water content, has ten times the melatonin of the raw fruit." (1)

Produced in the pineal gland at the base of the brain, melatonin controls sleepiness at night, wakefulness in daytime and functions as an antioxidant to help the body destroy free radicals.(2) Recent research conducted by Dr. Reiter at the University of Texas Health Science Center in San Antonio, Texas, quantified the availability and activity of melatonin found in cherry products. The results were astonishing. Cherries contain an extremely significant quantity of melatonin, enough to produce positive results in the body.

Montmorency cherries, which account for the majority of tart cherries produced in the United States, contain up to 13.5 nanograms (ng) of melatonin per gram of cherries, more than is normally found in the blood.(3)

Dr. Russel Reiter began his distinguished career more than 30 years ago in neuroendocrinology, the study of the glands and hormones of the brain. A year earlier, in 1958, a dermatologist named Aaron Lerner at Yale University discovered the existence of melatonin. (4) Today, Dr. Reiter is

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the preeminent scientist on melatonin and the advantageous effects it has on human health and well-being. Dr. Reiter has authored or co-authored more than 700 papers in his field, trained over 130 doctorates, and is the author of the book Melatonin, published by Bantam Books. His peers consider him the "dean of melatonin research".

One of the main areas on which Dr. Reiter focused in his recent work addresses a common consumer concern, which is, "will the melatonin present in cherries actually increase melatonin levels in the body favorably?" Melatonin is by far the most potent of the antioxidants, much more so than vitamins C, E and A. The reason: melatonin is soluble both in fat and water and can therefore enter some cells that vitamins cannot. For example, vitamin E is soluble in the lipid part of the cell only and vitamin C in the aqueous part. Melatonin is soluble in both. For this reason, Dr. Reiter says, eating cherries with high melatonin concentrations will increase the antioxidant capacity in the body.

Although melatonin is available as a supplement and can be purchased without a prescription, Dr. Reiter and other health experts extol the benefits of consuming melatonin through food consumption. Not only do many foods provide beneficial antioxidants and similar compounds, they are often found in foods that provide a variety of health benefits. Cherries may, one day, be classified as a functional food, but they also offer consumers great flavor, versatility and nutrition.

Melatonin Levels in Different Tart Cherry Products:

Fresh Tart Cherries: Up to 13.5 nanograms (ng) of Melatonin per gram

Tart Cherry Juice Concentrate: Has up to 10 times more the Melatonin per gram when compared to the raw fruit.

Tart Cherry Powder: 137+ ng per gram



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(Cherry powder is used to make tart cherry capsules)

Thanks to advances in food science technology, different production methods are able to extract different levels of this naturally occurring compound and deliver them to you.

What is Melatonin?

Melatonin is produced in the pineal gland, which is located at the base of the brain. In addition to controlling the body's rhythmic clock, melatonin also acts as an antioxidant. It helps to combat free radicals in the body. Additional research from the University of Texas indicates melatonin is both soluble in both fat and water. This helps this compound to penetrate some cells that vitamins cannot enter, thus melatonin is more potent than vitamins A, C, and E. Although melatonin is available without a prescription, food experts recommend consuming this beneficial compound through whole food consumption like tart cherries.

Tart Cherries May Help to Soothe Muscle Soreness to Physical Exercise*

Another benefit of the tart cherry is it may help to soothe muscle soreness due to physical exercise*.

Much research has been conducted on the benefits of tart cherries regarding healthy joint function* and cardiovascular health* issues. The University of Vermont and colleagues at New York's Nicholas Institute of Sports Medicine and Athletic Trauma and Cornell University conducted a study on a fresh, highly-concentrated tart cherry juice blend in preventing the symptoms of muscle pain and damage on 14 male college students. This was a placebo-controlled study by the researchers.



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