The Montmorency Cherry Report

Professional Use Only

CherryActive®

Introduction

Researchers continue to explore the benefits of “superfoods” - a unique group of nutrient-rich fruit and vegetables that contain natural compounds shown to have potential health-promoting properties.

Few foods fall into this category and emerging science shows Montmorency cherries (Prunus Cerasus) are among them. Montmorency cherries, commonly found in juice, dried and powdered forms, are rich in antioxidants and contain potent, naturally-occurring phytonutrients, including anthocyanins and melatonin, which have been linked to a variety of health benefits.

A number of recent research studies suggest consumption of Montmorency cherries may help reduce inflammation and ease the pain of arthritis, reduce the occurrence of gout, help maintain healthy sleep patterns and accelerate recovery after training and sports.

This report provides an overview of the scientific evidence and potential benefits of Montmorency cherry consumption. The aim of the report is to help dieticians, nutritional therapists and other healthcare professionals promote good health, as part of a healthy diet and active lifestyle.

This booklet is neither intended to prevent, treat or cure disease nor to provide individual recommendations.

The Montmorency Cherry Report

Contents

CherryActive®

Antioxidants

Antioxidants are compounds that deactivate damaging free radicals.

Free radicals are highly reactive compounds that cause damage to cells and contribute to the diseases and signs associated with the ageing process.

Free radicals are formed naturally in the body through normal metabolism. External sources, which include chemical pollutants, smoke, radiation and over-cooked foods, can increase the body's exposure to free radicals.

Maintaining a high antioxidant diet may lower a person's risk for disease, stimulate and protect the immune system and possibly slow the ageing process.

Typical 5-a-Day Food Portions	ORAC Units*
Medium Banana (80g***)	650
Watermelon (80g)	113
Fresh Tomatoes (80g)	294
Garden Peas (80g)	480
Cooked Carrots (80g)	253
Total for selected 5-a-Day=	1790
CherryActive Concentrate (30ml) (dilutes to make one glass of cherry juice)	8260**

*Source: ORAC of Selected Foods – 2007.
** Source: ORAC CherryActive Concentrate, Brunswick Laboratories.
***80g is the standard portion measure for the 5-a-Day programme.

Oxygen Radical Absorbance Capacity (ORAC) is a laboratory test that measures the antioxidant levels in food. The higher the ORAC score, the better a food may be in defending our cells from free radical damage.

Antioxidants are found in abundance in fruit and vegetables. However, particular fruits and vegetables, the "superfoods", have significantly higher ORAC values than regular ones.

The table above shows a typical "5-a-Day" fruit and vegetable intake, with an ORAC score of 1,790 units. This is compared to the ORAC score of a 30ml serving of the superfood, CherryActive Concentrate, with a measured ORAC value of 8260 units.

To maintain a high antioxidant diet, therefore, it is important to consider the quality as well as the quantity of fruit and vegetables consumed.

Anthocyanins

Montmorency cherries are one of the richest sources of powerful compounds called anthocyanins, which provide the distinctive red colour and may hold the key to many of the benefits locked inside. Studies suggest that these health-promoting pigments possess antioxidant, anti-inflammatory and anti-carcinogenic properties.

Anthocyanins that give Montmorency cherries their deep, rich colour belong to a large group of phenolic compounds called flavonoids. Of the 150 different flavonoids found in plants, anthocyanins appear to have the greatest antioxidant capacity.

Research conducted at Michigan State University found that Montmorency cherries contained the highest concentrations of anthocyanins 1 and 2 – which help block enzymes in the body called cyclooxygenase 1 and 2 (popularly known as COX-1 and COX-2). Some pain medication works by inhibiting COX-1 and COX-2, which may explain why some people find that Montmorency cherries help ease the pain of arthritis and gout.

Montmorency cherries contain 30 to 40 milligrams of anthocyanins 1 and 2 in every 100 grams of fruit. Montmorency cherries contain significantly more anthocyanins and phenols than sweet cherries. For example, one study found that the total phenolic content of sweet cherries ranged from 92 to 147 milligrams/100 grams, while the same amount of Montmorency cherries contained up to 312 milligrams, or more than twice the phenols.

Relevant research

Traustadottir, T., Davies, S. S., Stock, A. A., Su, Y., Heward, C. B.,Roberts, L. J., II, & Harman, S. M. (2009). Tart cherry juice decreases oxidative stress in healthy older men and women. ***The Journal of Nutrition,*** 139, 1896–1900.

Domenico Fusco,Giuseppe Colloca, Maria Rita Lo MonacoandMatteo Cesari. Effects of antioxidant supplementation on the aging process.***Clinical Interventions in Aging.*** Sep 2007; 2(3) : 377–387

Ou B, Hampsch-Woodill M, Prior RL. Development and validation of an improved oxygen radical absorbance capacity assay using fluorescein as the fluorescent probe ***Journal of Agricultural Food Chemistry***. 2001;49:4619-4626.

Chandra A, Nair MG, Iezzoni A. Evaluation and characterization of the anthocyanin pigments in tart cherries (Prunus cerasus L.)***. Journal of Agricultural and Food Chemistry***. 1992;40:976-969.

Wang, H., Nair, M. G., Strasburg, G. M., Chang, Y.-C., Booren, A. M.,Gray, J. I., & DeWitt, D. L. (1999). Antioxidant and anti-inflammatory activities of anthocyanins and their aglycon, cyanidin, from tart cherries. ***Journal of Natural Products,*** 62, 294–296.

Chandra A, Nair MG, Iezzoni A. Isolation and stabilization of anthocyanins from tart cherries (prunus cerasus L.). ***Journal of Agricultural and Food Chemistry***. 1993;41:1062-1065.

Seeram NP, Momin RA, Nair MG, Bourquin LD. Cyclooxygenase inhibitory and antioxidant cyanidin glycosides in cherries and berries. ***Phytomedicine*** 2001;8:362-369.

CherryActive®

Gout

Gout is a type of arthritis that causes sudden and extremely painful attacks in the joints of the foot, knee, ankle, hand and wrist – especially the big toe.

It is a common joint condition affecting one in 14 men and one in 35 women. In men, it can occur any time after puberty, whereas in women it is uncommon before the menopause.

Gout is caused by excess uric acid in the bloodstream. An overload of uric acid can cause it to form into microscopic, needle-like, urate crystals in the joints, causing inflammation and intense pain.

All of the cells in the human body, and many of the foods we eat, contain substances known as purines. As old cells are broken down, or as foods are digested, these purines are converted to uric acid, which is carried in the blood.

Most people with gout have high levels of uric acid in their blood because they do not pass enough in their urine, often due to inefficient kidney function. High levels of purines in the diet and certain medications like diuretics are also factors that increase the occurrence of gout.

How Montmorency cherries help

Research studies show that consumption of Montmorency cherry juice can lower uric acid in the bloodstream. Lowering uric acid levels in the blood can prevent it forming crystals of urate that cause gout attacks.

Analysis of Montmorency cherries shows they contain significant levels of anthocyanins (far higher than other varieties of cherries and other fruit) which give the fruit its bright red colour. Scientists believe these compounds are behind the fruit's uric acid lowering effects.

Studies have also shown anthocyanins to possess anti-inflammatory properties. This may help reduce the inflammation and pain associated with acute gout attacks.

Therefore, individuals, with a susceptibility to gout, may be able to reduce uric acid levels and inflammation associated with gout attacks by including Montmorency cherries in their diet.

Although studies have used Montmorency cherry juice concentrate, freeze-dried powders and dried cherries may also be effective.

Research study

A study from Northumbria University found that after drinking Montmorency cherry concentrate, uric acid levels in the body significantly reduced in just a few hours.

In the single blind, two-phase study, 12 healthy participants were invited to drink CherryActive Concentrate (100% Montmorency cherry concentrate) to test how it affected the levels of uric acid in their blood and urine. They drank either 30ml or 60ml of the concentrate mixed with 100ml of water. Blood and urine samples were taken at regular intervals following consumption of the concentrate.

Two hours after drinking the cherry concentrate, uric acid levels in urine had increased by around 250%, indicating that the body was quickly excreting uric acid. This was reflected in blood tests, with uric acid levels in blood decreasing by around 36% eight hours after drinking the concentrate.

The results also showed a significant reduction (29%) in an inflammation marker (hsCRP).

The findings also revealed that while the 60ml dose of cherry concentrate increased the volumes of anthocyanins within the blood, it brought no additional benefit in lowering uric acid or inflammation compared to the 30ml dose, demonstrating that only a small volume of the cherry concentrate was needed to bring about the beneficial effects.

Relevant research

Phillip G. Bell, David C. Gaze, GarethW. Davison, TrevorW. George, Michael J. Scotter, Glyn Howatson. Montmorency tart cherry (Prunus cerasus L.) concentrate lowers uric acid, independent of plasma cyanidin-3-O-glucosiderutinoside . ***Journal of Functional Foods***, 2014. 82-90

Jacob, R. A., Spinozzi, G. M., Simon, V. A., Kelley, D. S., Prior, R. L.,Hess-Pierce, B., & Kader, A. A. (2003). Consumption of cherries lowers plasma urate in healthy women . ***The Journal of Nutrition*** 133, 1826–1829

Schlesinger, N., Rabinowitz, R., & Schlesinger, M. (2012). Pilot studies of cherry juice concentrate for gout flare prophylaxis. ***Journal of Arthritis,*** 1, 1.

Zhang, Y., Neogi, T., Chen, C., Chaisson, C., Hunter, D. J., & Choi,H. K. (2012). Cherry consumption and decreased risk of recurrent gout attacks. ***Arthritis and Rheumatism*** , 64, 4004–4011.

Blau L.W. (1950) Cherry diet control for gout and arthritis T***exas Reports on Biology and Medicine.*** 8(3):309-11.

Wang, H., Nair, M. G., Strasburg, G. M., Chang, Y.-C., Booren, A. M. Gray, J. I., & DeWitt, D. L. (1999). Antioxidant and anti-inflammatory activities of anthocyanins and their aglycon, cyanidin, from tart cherries. ***Journal of Natural products,*** 62, 294–296.

CherryActive®

Arthritis

Arthritis is inflammation within a joint. The two most common forms of arthritis are osteoarthritis and rheumatoid arthritis.

Osteoarthritis is a form of degenerative arthritis. It occurs when the cartilage becomes thinner and rougher. The bone underneath then tries to repair this damage but sometimes overgrows, altering the shape of the joint.

This loss of cartilage, and the wear and deformation of bone, causes inflammation of the joint, causing stiffness and pain.

Arthritis Research UK estimates that over eight million people have osteoarthritis in the UK. It is more common in older people, especially women, and particularly affects the joints that get heavy use, such as hips and knees, and also often the base of the thumb and the big toe joint.

Rheumatoid arthritis is a form of inflammatory arthritis. It is an autoimmune disease, which means that the immune system starts attacking the body's own tissues instead of germs and viruses. Rheumatoid arthritis causes inflammation in the synovium - the protective capsule surrounding the joint – which turns red, swells, produces extra fluid and is very painful.

Rheumatoid arthritis affects more than 400,000 people in the UK with three-quarters of sufferers being women.

How Montmorency cherries help

Anthocyanins are the compounds found in Montmorency cherries that give the fruit its bright red colour. Research studies have shown anthocyanins to possess anti-inflammatory properties.

Montmorency cherries have been shown to contain significantly more anthocyanins than other varieties of cherries and other fruit and vegetables containing these naturally-occurring compounds.

Including Montmorency cherries in the diet, in juice, dried or powdered forms, therefore, may help reduce the inflammation and pain associated with painful joint conditions, including osteo and rheumatoid arthritis.

Research study

A study from the Department of Medicine, Oregon Health & Science University, investigated the effect of Montmorency cherry juice on women with osteoarthritis.

The design was a randomized, double blind, placebo controlled trial. Twenty inflammatory osteoarthritis subjects (all female; 40-70 yrs) consumed Montmorency cherry juice or placebo twice daily for 21 consecutive days.

Participants assessed level of pain at baseline and after the intervention. Blood samples were collected at baseline and final visit to assess the biomarkers of inflammation.

Subjects on the Montmorency cherry juice showed a statistically significant reduction in the inflammation serum biomarker CRP ($p<0.05$).

The study drew a conclusion that Montmorency cherry juice may reduce inflammation as measured by certain serum inflammatory biomarkers among women with osteoarthritis.

Relevant research

Kuehl KS, Elliot DL, Sleigh A, Smith J. Efficacy of tart cherry juice to reduce inflammation biomarkers among women with inflammatory osteoarthritis. ***J Food Stud.*** 2012;1:14-25.

Schumacher HR, Pullman-Mooar S, Gupta SR, Dinnella JE, Kim R, McHugh MP. Randomized double-blind crossover study of the efficacy of a tart cherry juice blend in treatment of osteoarthritis (OA) of the knee. ***Osteoarthritis Cartilage*** 2013 Aug;21(8):1035-41

Wang, H., Nair, M. G., Strasburg, G. M., Chang, Y.-C., Booren, A. M. Gray, J. I., & DeWitt, D. L. (1999). Antioxidant and anti-inflammatory activities of anthocyanins and their aglycon, cyanidin, from tart cherries. ***Journal of Natural products,*** 62, 294–296.

Seeram NP, Momin RA, Nair MG, Bourquin LD. Cyclooxygenase inhibitory and antioxidant cyanidin glycosides incherries and berries. ***Phytomedicine*** . 2001 Sep;8(5):362-9.

Blau L.W. (1950) Cherries diet control for gout and arthritis ***Texas Reports on Biology and Medicine*** 8(3):309-11.

CherryActive®

Insomnia

Insomnia, or sleeplessness, is a sleep disorder in which there is an inability to fall asleep or to stay asleep as long as desired or experience poor sleep quality, where stage 3 (or delta) sleep, which has restorative properties, is not reached. Such sleep disturbances can cause significant distress and may cause problems in social, occupational, educational and other areas of the sufferer's life.

Insomnia has a variety of causes. Use of psychoactive drugs (including caffeine, nicotine, alcohol and medications) are regularly the cause of insomnia. Hormone shifts; stress, anxiety and other mental disorders; shift work and jet lag; poor sleep hygiene (noise, heat, poor bedding, light) and painful conditions like arthritis, can also keep people awake, or contribute to a bad night's sleep. Keen athletes may also suffer from exercise-induced insomnia in the form of prolonged sleep onset latency.

In the UK it is estimated that a third of all adults have episodes of insomnia. It tends to be more common in women and more likely to occur with age.

How Montmorency cherries help

Melatonin - a natural compound produced in the brain's pineal gland - controls the body's natural sleep cycles and circadian rhythms. Studies have shown that many insomniacs have low levels of circulating melatonin, which may be the cause, or a contributor, to their sleep problems.

Montmorency cherries are one of the few known food sources of melatonin. Studies show that drinking Montmorency cherry juice may significantly improve the quantity and quality of sleep.

Drinking 30ml Montmorency cherry concentrate, mixed with a little water an hour before bed is recommended.

Montmorency cherry capsules, half an hour before bed, is a recommended low calorie/low liquid alternative.

Research study

A study at Northumbria University investigated whether drinking Montmorency cherry juice would increase the urinary melatonin levels in adults and improve sleep quality.

Twenty healthy volunteers drank a 30ml serving of CherryActive's Montmorency cherry juice twice a day for seven days. Each 30ml serving was estimated to contain the equivalent of approximately 90-100 Montmorency cherries.

Urine samples were collected from all participants before and during the investigation to determine levels of melatonin, a naturally occurring compound that heavily influences the human sleep-wake cycle.

During the study, the participants wore an actigraphy watch sensor, which monitored their sleep and wake cycles. They also kept a daily diary on their sleeping patterns.

The researchers found that when participants drank the cherry juice for a week there was a significant increase in their urinary melatonin (15-16%) than the control condition and placebo drink samples.

The actigraphy measurements of participants who consumed the cherry juice saw an increase of around 25 minutes in their total sleep time and a 6% increase in their 'sleep efficiency', a global measure of sleep quality.

Relevant research

Howatson G, Bell PG, Tallent J, Middleton B, McHugh MP, Ellis J. Effect of tart cherry juice (Prunus cerasus) on melatonin levels and enhanced sleep quality. ***Eur J Nutr.*** 2012 Dec;51(8):909-16.

Pigeon WR, Carr M, Gorman C, Perlis ML. Effects of a tart cherry juice beverage on the sleep of older adults with insomnia: a pilot study. ***J Med Food.*** 2010 Jun;13(3):579-83.

Burkhardt S, Tan DX, Manchester LC, Hardeland R, Reiter RJ. Detection and quantification of the antioxidant melatonin in Montmorency and Balaton tart cherries (Prunus cerasus). ***Journal of Agricultural and Food Chemistry.*** 2001;49:4898-4902.

Hughes RJ, Sack RL, Lewy AJ (1998) The role of melatonin and circadian phase in age-related sleep-maintenance insomnia: assessment in a clinical trial of melatonin replacement. ***Sleep*** 21(1):52–66

Herxheimer A, Pertrie KJ (2002) Melatonin for the prevention of jet lag. ***Cochrane Database Syst Rev*** **9:11–24**

CherryActive®

Exercise recovery

Intense, or prolonged, exercise training or competitive sport causes both physical and oxidative damage to the muscle fibres and cells. This damage can cause inflammation and soreness in the worked muscle groups.

It can take several days after a hard training session for the muscles to fully recover their strength and for the inflammation and pain to recede. Training with fatigued and sore muscles is uncomfortable and can result in incorrect training movement and posture ("bad form").

Faster recovery from exercise training can result in higher training volumes and therefore greater improvements in strength, power, speed and endurance. Faster recovery can therefore contribute to gains in sporting performance and success.

How Montmorency cherries help

Montmorency cherries contain significant levels of natural compounds, called anthocyanins. Anthocyanins have been shown to possess anti-inflammatory properties, which can reduce the inflammation and pain after intense training.

Anthocyanins and other compounds in Montmorency cherries are also powerful antioxidants. Antioxidants mop up the increased volumes of harmful free-radicals in the body caused by intense, or prolonged training (which can otherwise overwhelm the body's natural antioxidant levels, causing oxidative stress and further damage to muscle cells).

Therefore the anti-inflammatory and antioxidant properties of Montmorency cherries can help speed up recovery from intense or prolonged exercise and contribute to increased training loads and improved performance.

Protecting against free radical damage may also help protect an athletes' immune system and help prevent coughs and colds etc. Therefore, a diet, rich in Montmorency cherries, may improve training and performance through less training downtime.

Lastly, Montmorency cherries have been shown to improve sleep quantity and quality. Quality sleep can also contribute to better recovery and better performance, as this is when the body's complex repair processes are most active.

Research study

A study at London South Bank University investigated whether the effects of intensive unilateral leg exercise on oxidative damage and muscle function were attenuated by consumption of CherryActive Concentrate, using a crossover experimental design.

Ten well-trained male overnight-fasted athletes completed two trials of 10 sets of 10 single-leg knee extensions at 80% one-repetition maximum. Trials were separated by 2 weeks, and alternate legs were used in each trial. Participants consumed each supplement (CherryActive) or an isoenergetic fruit concentrate for 7 days before and 48 hours after exercise.

Knee extension maximum voluntary contractions (MVC) were performed before, immediately after, and 24 and 48 h after the damaging exercise. Venous blood samples were collected at each time point, and serum was analyzed for creatine kinase (CK) activity, nitrotyrosine, high-sensitivity C-reactive protein, total antioxidant capacity, and protein carbonyls (PC).

The results showed that the muscles recovered their strength significantly faster in the CherryActive group (7% greater strength than placebo after 24 hours) and less muscle soreness was reported.

Relevant research

Phillip G. Bell, Ian H. Walshe, Gareth W. Davison, Emma J. Stevenson, Glyn Howatson (Nov 2014) Recovery facilitation with Montmorency cherries following high intensity, metabolically challenging exercise. ***Applied Physiology, Nutrition, and Metabolism,*** 10.1139/apnm-2014-0244

Bell PG, Walshe IH, Davison GW, Stevenson E, Howatson G. Montmorencycherries reduce the oxidative stress and inflammatory responses to repeated days high-intensity stochastic cycling.***Nutrients.*** 2014 Feb

Bowtell JL, Sumners DP, Dyer A, Fox P, Mileva K (2011) Montmorency cherry juice reduces muscle damage caused by intensive strength exercise. ***Med Sci Sports Exerc*** 43(8):1544– 1551

Kuehl K, Perrier E, Elliot D, Chesnutt J (2010) Efficacy of tart cherry juice in reducing muscle pain during running: a randomized controlled trial. ***J Int Soc Sports Nut*** 7(1):17

Howatson G, McHugh MP, Hill JA, Brouner J, Jewell AP, Van Someren KA, Shave RE, Howatson SA (2010) Influence of tart cherry juice on indices of recovery following marathon running. ***Scand J Med Sci Sports*** 20(6):843–852.

Connolly DAJ, McHugh MP, Padilla-Zakour OI (2006) Efficacy of a tart cherry juice blend in preventing the symptoms of muscle damage. ***Br J Sports Med*** 40(8):679–683.

CherryActive®

Frequently asked questions

How do CherryActive products differ from other cherry products?

CherryActive is the leading brand of products made from Montmorency cherries. The range includes concentrated juice, dried fruit and powdered supplement formats. CherryActive products are premium quality and contain no preservatives or other added ingredients. CherryActive products are backed by an extensive research programme. They are sold in health stores across the UK and Republic of Ireland.

Can CherryActive products be taken by people on medication?

CherryActive products are made from 100% Montmorency cherries and are classed as food (the capsules are classed as food supplements). There are no known contra-indications between CherryActive products and any pharmaceutical medication. However, if on medication, consumers should consult their doctor or other healthcare provider for specific advice.

Are there any side-effects with taking CherryActive products?

CherryActive products are made using 100% Montmorency cherries. Anyone with known allergies to cherries, or stone fruit in general, should consult their doctor or other healthcare provider for specific advice.

Can pregnant consumers take CherryActive products?

CherryActive products are made from 100% Montmorency cherries and are classed as food (the capsules are classed as food supplements). Many pregnant consumers have taken CherryActive products without any reported problems. However, pregnant consumers should consult their doctor or other healthcare provider for specific nutritional advice.

Can diabetic consumers take CherryActive products?

Although CherryActive Concentrate and dried cherries do not contain any added sugars, they do contain natural fruit sugars (please see product label for sugar and carbohydrate content). Therefore these sugars should be included in a diabetic's total recommended daily sugar and carbohydrate intake. CherryActive Capsules contain less than half a gram of carbohydrate per capsule, so may appeal to diabetic consumers and others on a restricted carbohydrate diet. Diabetic consumers should consult their doctor or other healthcare provider for specific nutritional advice.

Can children take CherryActive products?

CherryActive products are made from 100% Montmorency cherries and are classed as food (the capsules are classed as food supplements). It is recommended that children may consume CherryActive food products as part of a healthy diet and active lifestyle. Although CherryActive Concentrate and dried cherries do not contain any added sugars, they do contain natural fruit sugars, which should be included in a child's total recommended daily sugar and carbohydrate intake.

CherryActive®

Researchers continue to explore the benefits of “superfoods” - a unique group of nutrient-rich fruit and vegetables that contain natural compounds shown to have potential health-promoting properties.

Few foods fall into this category and emerging science shows Montmorency cherries (Prunus Cerasus) are among them. Montmorency cherries, commonly found in juice, dried and powdered forms, are rich in antioxidants and contain potent, naturally-occurring phytonutrients, including anthocyanins and melatonin, which have been linked to a variety of health benefits.

A number of recent research studies suggest consumption of Montmorency cherries may help reduce inflammation and ease the pain of arthritis, reduce the occurrence of gout, help maintain healthy sleep patterns and accelerate recovery after training and sports.

This report provides an overview of the scientific evidence and potential benefits of Montmorency cherry consumption. The aim of the report is to help dieticians, nutritional therapists and other healthcare professionals promote good health, as part of a healthy diet and active lifestyle.

This booklet is neither intended to prevent, treat or cure disease nor to provide individual recommendations.

Exclusive to CherryActive Asia Sdn Bhd to import, sell and distribute premium quality food and food supplements containing Montmorency cherries under the brand name CherryActive

Available in Malaysia & Singapore

Web: www.cherryactive.com.my Email: enquiries@cherryactive.com.my Phone/Text : 012 2558634 or 03 62428634
Web: www.cherryactive.sg Email: info@cherryactive.sg Phone: 0065 85433544

CherryActive®