



Superfoods Fact Sheet

Strawberry

(*Fragaria* spp)



Parts used: Berry

Although wild varieties are sometimes available, most strawberries are produced using the 'plasticulture' system in raised beds, and are cultivated worldwide for its fruit, which offer a real health bonanza, and are the only fruit to have seeds on their exterior.

Historic and Traditional Uses of Strawberries

Found wild not just in Europe and Asia, but also the American continent, strawberries have been grown in temperate regions throughout the world. The Roman prized wild strawberries for their medicinal properties.

Strawberries have long been consumed by humans. Archaeological evidence suggests human consumption as far back as the Stone Age. The first cultivated strawberries were grown in ancient Persia and the seeds of the strawberry plant travelled both east and west along the Silk Road and were being widely cultivated from Europe to the Far East.

The first recorded documented botanical illustration of a strawberry plant is believed to be from 1454.

It wasn't until the 18th century that cultivation began to be pursued in earnest. In 1714 a French engineer working in Peru and Chile found a native strawberry which was much larger than the European one and bought samples back to France. Crossbreeding resulted in a hybrid strawberry similar to that we grow today.

They were considered a luxury food, mainly enjoyed by the rich until the mid-19th century when railways brought rapid transportation links and enabled fresh strawberries to be enjoyed by more people.

The strawberry plant – roots, stems and leaves – have been used for medicinal purposes for millennia. The stem was rubbed into open wounds to draw out bacteria and help prevent infection. They were also used to treat burns. The roots have been used to aid diarrhea symptoms and the leaves made into an infusion to act as a diuretic, aid sore throats and help joint aches and pains.

Writing in the Middle Ages, Nicholas Culpepper the herbalist states "the berries are excellent good to cool the liver, the blood and the spleen or a hot cholerick stomach...the leaves and roots thereof are also good to fasten loose teeth and to heal spongy foul gums".

In provincial France, wild strawberries were regarded as an aphrodisiac!



Health Benefits of Strawberries

Cardiovascular Health

This is one of the best documented areas for health benefits for strawberries. According to the Doctrine of Signatures, the heart shaped strawberry fruit should be good for heart health, and so it is proving!

The antioxidant and anti-inflammatory properties of strawberries give good protection to both our heart and blood vessels. Research has shown that the various phytonutrients work together in a synergistic way to provide a wide range of cardiovascular benefits including:¹

- Decreased oxidation of fats in blood vessel cell membranes
- decreased levels of circulating fats, including total cholesterol, and LDL cholesterol
- decreased activity of angiotensin I-converting enzyme (ACE)

Blood Sugar Benefits

Several studies have recently found that regular intake of strawberries can lead to a decreased risk of type II diabetes. In addition a link has been made between intake of table sugar and the ability of strawberries to reduce the impact of this by the simultaneous intake of strawberries at the same time. The researchers have speculated that the polyphenols in strawberries help contribute to this effect, particularly the ellagitannins, since these inhibit the activity of alpha-amylase, a starch digesting enzyme.²

Anti-Cancer Benefits

Benefits for cancer prevention have been documented for strawberries in relation to breast, cervical, colon and oesophageal cancer so far, but given the antioxidant and anti-inflammatory properties of strawberries it is expected that continuing research will show benefits for many other types of cancer.³

Most of the research to date has focused on the phytonutrient content, particularly ellagic acid and ellagitannins, which are thought to have chemopreventive properties, although their action is not yet fully understood. They would appear to boost the efficacy of antioxidant enzymes such as catalase and superoxide dismutase and inhibit the activity of pro-inflammatory enzymes such as cyclooxygenase 2 (COX2) and inducible nitric oxide synthase (iNOS)⁴.



¹ Nutr Res 2010 Jul;30(7);462-9 Strawberries decrease atherosclerotic markers in subjects with metabolic syndrome. Basu A, Fu DX, Wilkinson M et al. J Am Coll Nutr Feb 2010;29;46-54 Strawberry modulates LDL Oxidation and Postprandial lipemia in response to high fat meal in overweight hyperlipidemic men and women. Burton-Freeman B, Linares A, Hyson D et al. J Atheroscler Thromb 2011 Jan 13 Attenuation of meal-induced inflammatory and thrombotic responses in overweight men and women after 6-week daily strawberry intake. Ellis CL, Edirisinghe I, Kappagoda T et al. J Am Coll Nutr Aug 2007;26:303-310 Strawberry Intake, lipids, C-Reactive protein and the risk of cardiovascular disease in women. Sesso HD, Gaziano JM, Jenkins DJA et al.

² J Med Food 2010 13 (5);1027-35 Evaluation of antiproliferative, anti-type 2 diabetes and antihypertension potentials of ellagitannins from strawberries. Pinto MDA, de Carvalho JE, Lajolo FM et al. B J Nutr 2010 103(8);1094-1097 Berries modify the postprandial plasma glucose response to sucrose in healthy subjects. Torren R, Sarkkinen E, Tapola N et al.

³ J Agric Food Chem 2003 51(23);6887-92. Antioxidant and antiproliferative activities of strawberries. Meyers KJ, Watkins CB, Pritts MP, Liu RH.

⁴ J Med Food 2004 7 (4):450-455 Antimutagenic Activity of berry extracts. Smith SH, Tate PL, Huang G et al. Nutr Cancer 2006; 54(1):33-46 Protection against esophageal cancer in rodents with lyophilized berries. Stoner GD, Chen T, Kresty LA et al. J Med Food 2004 4(1);49-51 Anticarcinogenic activity of strawberry, blueberry, and raspberry extracts to breast and cervical cancer cells. Wedge DE, Meepagala KM, Magee JB et al.

Bowel Disease

Animals studies have shown improvement in inflammatory bowel problems such as colitis and Chrons with daily intake of strawberry extract or powder. It is thought that the salicylic acid might be partly responsible for this.⁵

Arthritis

Preliminary research is suggesting that the anti-inflammatory properties of strawberries can be helpful in improving the inflammation related problems of arthritis.



Eye Health

Although research is only in the preliminary stages, inflammation-related diseases of the eye such as macular degeneration, may be helped by the anti-inflammatory properties of strawberry phytonutrients.

Ageing

Several preliminary studies on aged animals are showing improved cognitive function as well as enhanced motor function. It is thought that the levels of phytonutrients in strawberries lay lower the presence of pro-inflammatory messaging molecules such as nuclear factor kappa-B that contribute to some of the problems of ageing.⁶

Memory Aid

Researchers at Tufts University published a study in the Journal of Neuroscience that in animal studies extracts of strawberry helped to significantly improve short term memory.

In addition, an infusion of strawberry leaves in boiling water, left to steep for 5 minutes has been shown to soothe the stomach and help digestive upset.

Nutritional Value of Strawberries

Strawberries have significantly high amounts of a variety of phytonutrients including:

Anthocyanins – cyanidins, pelargonidins

Flavonols – procyanidins, catechins, epicatechins, kaempferol, quercetin

Hydroxy-benzoic acids – ellagic acid, gallic acid, vanillic acid, salicylic acid

Hydroxy-cinnamic acids – cinnamic acid, coumaric acid, caffeic acid, ferulic acid

Tannins – ellagitannins, gallotannins

Terpenoids

Stilbenes - resveratrol

and have an ORACs score that places them 4th amongst fruits.

⁵ Indian J Pharmacol 2011 43 (1);18-21 Effect of fruit extract of fragaria vesca L on experimentally induced inflammatory bowel disease in albino rats. Kanodia L, Borgohain M, and Das S

⁶ J Nutr Grape juice, berries and walnuts affect brain aging and behaviour. Joseph JA, Shukitt-Hale B and Willis LM. Neurobiol Aging 2006 Beneficial effects of fruit extracts on neuronal function and behaviour in a rodent model of accelerated aging. Shukitt-Hale B, Carey AN, Jenkins D et al.

It has excellent levels of Vitamin C, as well as being a good source of folic acid and potassium. Per serving (8 strawberries) strawberry has more Vitamin C than oranges!

Strawberries are also an excellent source of the trace mineral manganese, which is essential for maintaining healthy bone structure, absorbing calcium, creating enzymes that build bone and a host of other benefits, including proper functioning of your sex hormones, as well as being a good source of ellagic acid which has anti-carcinogenic and anti-mutagenic activity.

Per 100 mg

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| Calcium | 16 mg |
| Iron | 0.41 mg |
| Magnesium | 13 mg |
| Phosphorus | 24 mg |
| Potassium | 153 mg |
| Sodium | 1 mg |
| Zinc | 0.14 mg |
| Selenium | 0.6 mcg |
| Manganese | 0.556 mg |
| Vitamin C | 58.8 mg |
| B1 | 0.024 mg |
| B2 | 0.022 mg |
| B3 | 0.386 mg |
| B6 | 0.047 mg |
| Folic acid | 24 µg |
| Vitamin A | 12 iu |
| Vitamin E | 0.29 mg |
| Vitamin K | 2.2 µg |

Source: USDA National Nutrient Database

