



The taste you love, the nutrition you want.

Raspberries and Human Health: Time for Recognition

*Dr. Venket Rao & Dawn Snyder, Department of
Nutritional Sciences, Faculty of Medicine,
University of Toronto, Canada*

Dietary guidelines around the world recommend increased consumption of fruits and vegetables for the prevention of chronic diseases. Fruits and in particular berries are good sources of several compounds that contribute towards good health. Red raspberries are among the most popularly consumed berries. In addition to their attractive color and appealing flavor, red raspberries contain several essential nutrients and beneficial phytochemicals. They can be considered a healthy food choice since they are low in total calories and fat, contain no cholesterol, are high in dietary fiber, and are a good source of vitamin C, folate, potassium and magnesium with very low amounts of sodium.

Red raspberries are rated among the top ten commonly consumed fruits and vegetables in the American diet in terms of their antioxidant potential. They contain high levels of beneficial phytochemicals including anthocyanins, hydrolysable tannins and phenolic acids. They are a particularly rich source of cyanidin and are unique among the berries for their high ellagitannin content, which can be hydrolyzed to yield ellagic acid.

There is a growing body of scientific evidence to support the health benefits of consuming raspberries. Listed among these health benefits are their potential role in the prevention of cancer, cardiovascular diseases, diabetes, obesity, neurodegenerative diseases and aging. To understand the role of raspberries in human health, one must recognize the significance of dietary

components on cellular functioning in the etiology of human disease.

Several mechanisms of action are known to be involved in mediating the disease process. Important among them are the mechanisms of oxidative stress, inflammation, immune function and metabolism. The nutritional profile of raspberries and the presence of beneficial phytochemicals provide them the ability to influence several of these mechanisms and thereby health outcomes. For example, the low energy, low fat, no cholesterol and high fiber content of raspberries is consistent with nutritional profiles of foods that support healthy heart function, and promote satiety and weight loss. High potassium and low sodium content of raspberries may also help reduce hypertension.

Similarly, their phytochemical composition and antioxidant properties may function as anti-inflammatory and anti-atherosclerotic agents via the inhibition of NO and TNF α , and protect against LDL oxidation, reducing cardiovascular diseases. Additionally these compounds may support a role in the prevention of cancer by protecting against oxidative DNA damage. Their possible role in diabetes prevention and maintenance may be mediated via the inhibition of the digestive enzymes resulting in a reduction in post-prandial glucose levels and improved insulin response.

Most of the studies showing the beneficial effects of raspberries have so far been done in vitro in tissue culture or using animal models and have looked at individual phytochemicals. Ellagic acid and cyanidin have been shown to inhibit the growth of several cancer

cells in both in vitro and animal studies. Animal studies have also supported the ability of ellagic acid in the prevention of cancer. The protective properties of these phytochemicals could be attributed to their structural similarity to other endogenous biological compounds. Studies have demonstrated that ellagic acid is absorbed into the body readily. Another unique feature of raspberries is the presence of ketones.

Raspberry ketones are structurally similar to capsaicin in red peppers, synephrine in citrus peel and zingerone in ginger extract, all of which have been shown to have health benefits. In a recent animal study, raspberry ketones were shown to prevent high fat diet induced elevation in body, liver and visceral adipose tissue weights as well as high fat induced elevation in hepatic triglycerides and an increase in norepinephrin induced lipolysis. Based on these observations it has been suggested that raspberry ketones may prevent obesity and fatty liver in the rat model. No human studies have been done so far to confirm these observations and its safety at high levels of intake.

There is convincing scientific evidence to substantiate the health benefits of red raspberries' attributable to their nutritional profile and the biological activity of their individual phytochemical components.

Pharmokinetic studies have demonstrated that ellagitannins and anthocyanins are hydrolyzed into ellagic acid and anthocyanidins, which are absorbed

into the body in their bioactive form. However, in the opinion of nutritionists and other health professionals, consumption of whole foods given the advantage of complimentary and synergistic effects among their components, far outweighs consuming individual phytochemicals. With this in view we have undertaken a clinical study to investigate the effect of consuming frozen whole red raspberries on several health biomarkers in healthy human subjects.

The consumption of red raspberries in our study has been kept to a realistic quantity of one-cup individually quick frozen berries per day for a period of four weeks. This study is in progress at present.

Weighing the current body of scientific evidence, it would be prudent to include consumption of red raspberries as a regular part of a healthy diet for the maintenance of a high quality life and the prevention of chronic diseases.

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