

# Antioxidants: Small but Powerful Cancer Warriors

By Allison Tannis, MSc.

About 40% of Canadians will develop cancer during their lifetime. Cancer is a big killer, but its enemy is very small.

When leading researchers reviewed research on diet and cancer, they reported fruits and vegetables as the food most likely to reduce the risk of cancer. Actually, it is small compounds (i.e. phytochemicals) in fruits and vegetables, such as antioxidants, which help the body fight against cancer. Antioxidants are our small, but powerful warriors against cancer.

Cancer occurs when a cell loses regulatory mechanisms, and grows uncontrollably. There are many causes of cancer, including free radicals. Free radicals form naturally in the body during metabolism. Antioxidants prevent the structural and functional damage to membranes, enzymes and nucleic acids caused by free radicals.

Antioxidants known for their cancer fighting power include vitamins C and E, selenium and carotenoids (e.g. beta-carotene, lycopene, and lutein). More generally, phytochemicals with promising evidence of reducing risk of cancer include: dietary fibre, folic acid, dithiolthiones, glucosinolates, indoles, isothiocyanates, flavonoids, polyphenols (e.g. anthocyanins), phenols, protease inhibitors, plant sterols, allium and limonene. These compounds are found in a number of fruits and vegetables.

What packs the biggest punch? Recent research ranked blueberries #1 in antioxidant activity, compared with 40 other commercially available fruits and vegetables. Scientists attribute these benefits to anthocyanins and other phytochemicals found in blueberries. Anthocyanins are responsible for the intense blue color of blueberries.

Recent research at the University of Guelph reported that blueberry consumption results in elevated antioxidant levels in the blood. Increasing the antioxidant status of blood may result in the reduced risk of many chronic degenerative diseases, such as cancer. Therefore, blueberry consumption appears to be an effective way of reducing the risk of cancer.

Eating fruits and vegetables is part of a healthy diet, as they are low in fat and salt, while high in fibre and micronutrients. In addition, Health Canada has approved the Health Claim, "A diet rich in a variety of fruits and vegetables may help reduce the risk of some types of cancer."

However, despite this knowledge, only 30% of Canadians eat the recommended servings of fruits and vegetables per day. In fact, the Canadian Cancer Society reported that only 40% of women and 22% of men consume the required amount of fruits and vegetables to be effective in fighting diseases.

Whether it is possible to consume the proper daily amounts of antioxidants, and phytochemicals is greatly debated. Some scientists and dieticians recommend the use of supplements, while others do not.

Health Canada's Guide to Healthy Eating, recommends 5-10 servings of fruits and vegetables per day. However, some Canadians are finding this hard to attain. Therefore, Canadians need to consider alternative sources to fresh fruits and vegetables, keeping in mind that fresh is best. Alternatives can include canned, frozen or juiced fruits and vegetables, as well as nutraceuticals and functional foods.

As with all alterations to diet, it is important that consumers educate themselves. Studies conducted in the 1970s, found that increased amounts of dietary beta-carotene in smokers, increased the risk of developing lung cancer. Consumer education is greatly needed to assure that the effects of dietary changes are the desired ones. Consult a dietician or physician regarding your diet, and whether a change to your diet is right for you.

Dietary factors may account for 35% of cancer deaths. Therefore, assuring an adequate diet of our little warriors, antioxidants, is of great importance.

*Allison Tannis, BSc., MSc. is a nutritional educator and author of **Vitality: Quest for a healthy diet**. Visit [www.allisontannis.com](http://www.allisontannis.com) for more information, articles and upcoming appearances.*

