Plant-Based Foods

This section has been reviewed and approved by the Cancer.Net Editorial Board [1], February / 2012

Naturally occurring substances in plants, animals, fungus (such as mushrooms), and bacteria (such as probiotics) that lower the risk of disease are called biologically active food constituents or bioactives. Research suggests that eating foods with bioactives may reduce the risk of cancer. Most of the research about bioactives has been related to phytochemicals, which are naturally occurring chemicals in plants.

Phytochemicals are in nearly all fruits and vegetables and many times can be identified with the color of the food. They include:

- Carotenoids, the chemicals that give fruits and vegetables an orange or yellow color, such as carrots and sweet potatoes
- Phenolics, a group of substances found in many herbs, spices, vegetables, fruits, green tea, and berries
- Organosulfur compounds, the substances found in cruciferous vegetables (such as broccoli and cabbage) and allium vegetables (such as garlic, leeks, and onions)

Other common food sources of bioactives that may help prevent some types of cancer include tomatoes, spinach, red wine, citrus fruits, turmeric (a spice found in Indian curry), and soy.

The chemicals found in plants protect against cancer in several ways, and it is likely that the various phytochemicals work together to lower cancer risk. Some help regulate hormones, such as estrogen. Others work against cancer cell growth or block inflammation (a process in the body that helps fight infection and may contribute to some diseases). Many are antioxidants and lower the possibility of oxidative damage (damage to cells by oxidants, such as tobacco or ozone). Read more about antioxidants and vitamins and minerals [2].

Current Research

Soy and breast cancer. Some laboratory studies show that soybean products may help protect against breast, prostate, colon, and lung cancer; however, clinical studies in people have been conducted to more clearly determine the role in cancer prevention.

The relationship between soy, which contains phytochemicals, and breast cancer risk is especially complex, and research study results are conflicting. In addition, some studies suggest that soy may act like the hormone estrogen, which causes concern for women with a type of breast cancer that is fueled by estrogen (called estrogen receptor-positive breast cancer).

Current evidence suggests that eating normal amounts (such as three servings each day) of soy foods, such as soy milk and tofu, is unlikely to increase risk for breast cancer growing and spreading. However, taking concentrated isoflavone (a type of estrogen from plants found in soybeans) or soy supplements is not recommended, because these products could act like estrogen in the body.

Lycopene and prostate cancer. Lycopene is a carotenoid found in tomato products, such as tomato sauce. Other important sources of lycopene include pink grapefruit, watermelon, and apricots. Lycopene studies show that it may protect against several cancers, including lung, stomach, prostate, and digestive tract cancers, such as colon, oral and esophageal. However, a direct relationship between eating lycopene and lowering the risk of cancer has not been established. Additional clinical trials are needed.

Cruciferous vegetables. These vegetables, which include broccoli, cauliflower, cabbage, Brussels sprouts, bok choy, and kale, are likely to protect against some types of cancers. A protective effect has been shown for cancers of the mouth, pharynx (part of throat), larynx (voice box), esophagus, and stomach. Several laboratory studies have suggested that cruciferous vegetables help regulate the body's complex system of enzymes that defend against cancer and that components of the vegetables can stop the growth of cancer cells.

Adding plant-based foods to your diet

Although association studies show mixed results in terms of the connection between plant-based foods to cancer prevention, there is enough evidence to suggest that adding more fruits and even more importantly, vegetables, to your diet may be protective. In addition, eating fruits and vegetables has been shown to provide additional health benefits, such as lowering the risk for heart disease and stroke.

Here are some suggestions to help increase the amount of bioactives in your diet:

- Make half your plate a combination of vegetables and to a slightly lesser extent, fruit at every meal. (How many fruits and vegetables you need each day depends on your age, sex, and how much physical activity you do. Visit www.choosemyplate.gov [3] for more information.)
- Try new fruits and vegetables, and choose vegetables with a variety of colors so that you get as many different phytochemicals in your diet as possible.

- In addition to buying fresh fruits and vegetables, keep frozen, canned, and packaged vegetables on hand.
- Shred fresh vegetables or fruit into items such as stews, soups, and casseroles.

More Information

General Nutrition Recommendations [4]

Nutrition Recommendations During and After Treatment [5]

Additional Resources

Fruits and Veggies?More Matters [6]

Cruciferous Vegetables and Cancer Prevention [7]

Links:
[1] http://www.cancer.net/about-us
[2] http://www.cancer.net/patient/All+About+Cancer/Risk+Factors+and+Prevention/Diet+and+Nutrition/Vitamins+and+Minerals/Vitamins+and+Minerals
[3] http://www.choosemyplate.gov
[4] http://www.cancer.net/patient/All+About+Cancer/Risk+Factors+and+Prevention/Diet+and+Nutrition/General+Nutrition+Recommendations
[5] http://www.cancer.net/patient/All+About+Cancer/Risk+Factors+and+Prevention/Diet+and+Nutrition/Nutrition+Recommendations+During+and+After+Treatment/Nutrition+Recommendations+During+and+After+Treatment
[6] http://www.fruitsandveggiesmorematters.org/
[7] http://www.cancer.gov/cancertopics/factsheet/diet/cruciferous-vegetables