



PHYTOCHEMICALS

**Another Good Reason to Eat 5-9 Servings
of Fruits and Vegetables Every Day!**

A phytochemical is a natural bioactive compound found in plant foods that works with nutrients and dietary fiber to protect against disease. Research suggests that phytochemicals, working together with nutrients found in fruits, vegetables and nuts, may help slow the aging process and reduce the risk of many diseases, including cancer, heart disease, stroke, high blood pressure, cataracts, osteoporosis, and urinary tract infections.

Pronounced "fight-o-chemicals," phytochemicals fight to protect your health. They can have complementary and overlapping mechanisms of action in the body, including antioxidant effects, modulation of detoxification enzymes, stimulation of the immune system, modulation of hormone metabolism, and antibacterial and antiviral effect.

"Phyto" is a Greek word that means plant and phytochemicals are usually related to plant pigments. So, fruits and vegetables that are bright colors - yellow, orange, red, green, blue, and purple - generally contain the most phytochemicals and the most nutrients.

You can benefit from all of the phytochemicals and nutrients found in plant foods by eating 5-9 servings of fruits and vegetables a day and eating more whole grains, soy and nuts.

More than 900 different phytochemicals have been found in plant foods and more will be discovered. These protective plant compounds are an emerging area of nutrition and health, with new research reported everyday.

Remember, to get your Phytos eat 5-9 servings of colorful fruits and vegetables every day!

Why Fruits and Vegetables are Better Than Supplements

Colorful fruits and vegetables contain hundreds of phytochemicals that work together with nutrients to promote health and prevent disease. When you eat fruits and vegetables, the phytochemicals are easily absorbed to provide the maximum health benefits.

In contrast, supplements or pills contain large doses of only one or two phytochemicals. These isolated supplements have not proven to be effective or even safe.

You can benefit from all of the phytochemicals and nutrients found in plant foods by eating 5-9 servings of fruits and vegetables a day and eating more whole grains, soy and nuts.

Phytochemicals in Fruits and Vegetables

Carotenoids

Carotenoids are the pigments responsible for the colors of many red, green, yellow and orange fruits and vegetables. Carotenoids are a large family of phytochemicals which include alpha-carotene, beta-carotene, lutein, lycopene, cryptoxanthin, canthaxanthin, zeaxanthin, and others.

Carotenoids protect the body by decreasing risk of heart disease, stroke, blindness, and certain types of cancer. They may also help to slow the aging process, reduce complications associated with diabetes, and improve lung function. Fruits and vegetables that are dark green, yellow, orange or red contain carotenoids.

Beta-Carotene Beta-Carotene may help to slow the aging process, reduce the risk of certain types of cancer, improve lung function, and reduce complications associated with diabetes. Beta-carotene is found in yellow-orange fruits and vegetables such as mangoes, cantaloupe, apricots, papaya, kiwifruit, carrots, pumpkins, sweet potatoes, and winter squash, and green vegetables, such as broccoli, spinach, and kale.

Lutein Lutein is essential for maintaining proper vision as we age. It has been shown to reduce the risk of cataracts and macular degeneration, the leading causes of blindness in older people and may help reduce the risk of certain types of cancer. Kale, spinach and collard greens contain the most lutein of any fruit or vegetable. Other sources of lutein include kiwifruit, broccoli, collard greens, Brussels sprouts, Swiss chard, and Romaine lettuce.

Lycopene Diets rich in lycopene have been shown to reduce the risk of prostate cancer and heart disease. Lycopene is found in red fruits and vegetables such as tomatoes and cooked tomato products, red peppers, pink grapefruit, watermelon.

Zeaxanthin Zeaxanthin may help to prevent macular degeneration, which is the leading cause of visual impairment in people over 50. It may also help to prevent certain types of cancer. Corn, spinach, winter squash, and egg yolks contain zeaxanthin.

Flavonoids

Flavonoids are another large family of protective phytochemicals found in fruits and vegetables. Flavonoids, also called bioflavonoids, act as antioxidants. Antioxidants neutralize or inactivate highly unstable and extremely reactive molecules, called free radicals, that attack the cells of our body every day. Free radical damage is believed to contribute to a variety of health problems, including cancer, heart disease and aging.

There are many different types of flavonoids and each appears to have protective health effects. Some of the better known flavonoids include resveratrol, anthocyanins, quercetin, hesperidin, tangeritin, kaempferol, myricetin, and apigenin. Flavonoids are found in a variety of foods, such as oranges, kiwifruit, grapefruit, tangerines, berries, apples, red grapes, red wine, broccoli, onions, and green tea.

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| Resveratrol | Resveratrol may reduce the risk of heart disease, cancer, blood clots and stroke. Red grapes, red grape juice, and red wine contain resveratrol. |
| Anthocyanins | Anthocyanins, which are particularly high in blueberries, have been shown to protect against the signs of aging. In one study, elderly rats that ate the equivalent of a half-cup of blueberries daily for eight weeks improved balance, coordination, and short-term memory. Scientists think these results may apply to humans as well. Anthocyanins in blueberries and cranberries have also been shown to help prevent urinary tract infections. Blueberries, cherries, strawberries, kiwifruit, and plums contain anthocyanins. |
| Quercetins | Quercetins may reduce inflammation associated with allergies, inhibit the growth of head and neck cancers, and protect the lungs from the harmful effects of pollutants and cigarette smoke. Apples, pears, cherries, grapes, onions, kale, broccoli, leaf lettuce, garlic, green tea, and red wine contain quercetins. |
| Hesperidin | Hesperidin is a flavonoid that may protect against heart disease. Hesperidin is found in citrus fruits and fruit juices, such as oranges and orange juice, grapefruit and grapefruit juice, tangerines, lemons, limes, mandarins, and tangelos. |
| Tangeritin | Tangeritin may help prevent cancers of the head and neck. Tangeritin is found in citrus fruits and their juices. |

Phenolic Compounds

Phenolic compounds may reduce the risk of heart disease and certain types of cancer. Phenolic compounds may be found in berries, prunes, red grapes and red grape juice, kiwifruit, currants, apples and apple juice, and tomatoes.

Ellagic Acid Ellagic acid is a phenolic compound that may reduce the risk of certain types of cancer and decrease cholesterol levels. Ellagic acid is found in red grapes, kiwifruit, blueberries, raspberries, strawberries, blackberries, and currants.

Sulphoraphane

Sulphoraphane is in a class of phytochemicals called isothiocyanates. Sulphoraphane may reduce the risk of colon cancer. Cruciferous vegetables such as broccoli sprouts, broccoli, cauliflower, kale, Brussels sprouts, cabbage, bok choy, collard greens, turnips and turnip greens contain sulphoraphane.

Limonene

Limonene is in a class of phytochemicals called mono-terpenes. It is found in the rinds and the edible white membranes of citrus fruits, such as oranges, grapefruit, tangerines, lemons and limes. Limonene may help to protect the lungs and reduce the risk of certain types of cancer.

Indoles

This family of phytochemicals may reduce the risk of certain types of cancer, including breast cancer. Indoles are found in cruciferous vegetables, such as broccoli, cauliflower, kale, Brussels sprouts, cabbage, bok choy, collard greens, watercress, and turnips and turnip greens.

Allium Compounds

Allium compounds may reduce the risk of certain types of cancer and lower cholesterol and blood pressure. Garlic, onions, chives, leeks, and scallions contain allium compounds.

Fruits and Veggies Rich in Phytochemicals

Research suggests that:

- most fruits and vegetables contain phytochemicals
- some fruits and vegetables contain many different phytochemicals
- phytochemicals in a specific fruit or vegetable work together with nutrients to protect your health

Following is a list of the most well researched fruits and vegetables and the phytochemicals they contain.

Apples and apple juice contain phenolic compounds which may protect against heart disease.

Apricots (fresh and dried) contain beta-carotene which may help slow the aging process, reduce the risk of certain types of cancer, improve lung function, and reduce complications associated with diabetes.

Blackberries contain ellagic acid which may reduce the risk of certain forms of cancer and decrease cholesterol levels.

Blueberries contain anthocyanins which may protect against the effects of aging. Blueberries also contain ellagic acid which may reduce the risk of certain forms of cancer and decrease cholesterol levels.

Bok Choy contains a variety of phytochemicals including sulphoraphane and indoles. These phytochemicals may reduce the risk of certain types of cancer.

Broccoli contains many different phytochemicals including sulphoraphane, indoles, beta-carotene, lutein, and quercetins. These phytochemicals may help slow the aging process, reduce the risk of certain types of cancer, improve lung function, protect against macular degeneration and cataracts, reduce inflammation associated with allergies, and reduce complications associated with diabetes.

Broccoli sprouts contain sulphoraphane which may reduce the risk of certain types of cancer.

Brussel sprouts contain a variety of phytochemicals including sulphoraphane and indoles. These phytochemicals may reduce the risk of certain types of cancer.

Cabbage contains a variety of phytochemicals including sulphoraphane and indoles. These phytochemicals may reduce the risk of certain types of cancer.

Cantaloupe contains beta-carotene which may help slow the aging process, reduce the risk of certain types of cancer, improve lung function, and reduce complications associated with diabetes.

Carrots contain beta-carotene which may help slow the aging process, reduce the risk of certain types of cancer, improve lung function, and reduce complications associated with diabetes.

Cauliflower contains a variety of phytochemicals including sulphoraphane and indoles. These phytochemicals may reduce the risk of certain types of cancer.

Cherries contain anthocyanins which may protect against the signs of aging. Cherries also contain quercetins which may reduce inflammation associated with allergies, inhibit the growth of head and neck tumors, and protect the lungs from the harmful effects of pollutants and cigarette smoke.

Chives contain allium compounds that may reduce the risk of certain forms of cancer and lower cholesterol and blood pressure.

Citrus fruits, such as oranges, grapefruits, and tangerines contain hesperidin and tangeritin which act as antioxidants to reduce the risk of heart disease and various types of cancer. Citrus fruits also contain limonene which may protect the lungs.

Collard greens contain lutein which may reduce the risk of cataracts and macular degeneration. Collard greens also contain indoles and sulphoraphane which may help decrease the risk of certain types of cancer.

Corn contains zeaxanthin which may help to prevent macular degeneration, which is the leading cause of visual impairment in people over 50.

Currants contain ellagic acid which may reduce the risk of certain forms of cancer and decrease cholesterol levels.

Garlic contains allium compounds which may reduce the risk of certain forms of cancers and lower cholesterol levels and blood pressure. Garlic also contains quercetins which may reduce inflammation associated with allergies, inhibit the growth of head and neck tumors, and protect the lungs from the harmful effects of pollutants and cigarette smoke.

Kale contains a variety of phytochemicals including beta carotene which may help slow the aging process, reduce the risk of certain types of cancer, improve lung function, and reduce complications associated with diabetes and lutein which may reduce the risk of cataracts and macular degeneration. Kale also contains indoles and sulphoraphane which may help decrease cancer risk and quercetins which may reduce inflammation associated with allergies, inhibit the growth of head and neck

tumors, and protect the lungs from the harmful effects of pollutants and cigarette smoke.

Kiwifruit contains a variety of phytochemicals, including beta-carotene, lutein, anthocyanins, and ellagic acid. These phytochemicals may reduce the risk of heart disease, certain types of cancer, cataracts, and macular degeneration.

Leaf Lettuce contains quercetins which may reduce inflammation associated with allergies, inhibit the growth of head and neck tumors, and protect the lungs from the harmful effects of pollutants and cigarette smoke.

Leeks contain allium compounds which reduce the risk of certain forms of cancer and may lower cholesterol levels and blood pressure.

Mangoes contain beta-carotene which may help slow the aging process, reduce the risk of certain forms of cancer, improve lung function, and reduce complications associated with diabetes.

Onions contain allium compounds which may reduce the risk of certain forms of cancer and lower cholesterol levels and blood pressure. Onions also contain quercetins which may reduce inflammation associated with allergies, inhibit the growth of head and neck tumors, and protect the lungs from the harmful effects of pollutants and cigarette smoke.

Papaya contain beta-carotene which may help slow the aging process, reduce the risk of certain forms of cancer, improve lung function, and reduce complications associated with diabetes.

Pears contain quercetins which may reduce inflammation associated with allergies, inhibit the growth of head and neck tumors, and protect the lungs from the harmful effects of pollutants and cigarette smoke.

Pink grapefruit contains lycopene which may decrease risk for prostate cancer and heart disease. Pink grapefruit also contains hesperidin and tangeritin which act as antioxidants to reduce the risk of heart disease and various types of cancer as well as limonene which may protect the lungs.

Plums contain anthocyanins which may help protect against the signs of aging.

Prunes contain phenolic compounds which act as antioxidants that may prevent the loss of long-term memory and learning ability.

Pumpkins contain beta-carotene which may help slow the aging process, reduce the risk of certain types of cancer, improve lung function, and reduce complications associated with diabetes.

Raisins contain phenolic compounds that may act as powerful antioxidants to help slow the aging process.

Raspberries contain ellagic acid which may reduce the risk of certain forms of cancer and decrease cholesterol levels.

Red grapes and grape juice contain resveratrol and ellagic acid which may lower the risk of heart disease and certain forms of cancer.. Red grapes also contain quercetins which may reduce inflammation associated with allergies, inhibit the growth of head and neck tumors, and protect the lungs from the harmful effects of pollutants and cigarette smoke.

Red peppers contain lycopene which reduce the risk of prostate cancer and heart disease.

Romaine lettuce contains lutein which may reduce the risk of cataracts and macular degeneration, the leading causes of visual impairment in people over 50.

Scallions contain allium compounds which may reduce the risk of certain forms of cancer and lower cholesterol levels and blood pressure.

Spinach contains beta-carotene which may help slow the aging process, reduce the risk of certain types of cancer, improve lung function, and reduce complications associated with diabetes. Spinach also contains lutein and zeaxanthin which may help prevent blindness. People who eat lots of spinach have a decreased risk of cataracts and macular degeneration, the leading causes of visual impairment in people over 50.

Strawberries contain anthocyanins which may protect against the effects of aging. Strawberries also contain ellagic acid which may reduce the risk of certain forms of cancer and decrease cholesterol levels.

Sweet potatoes contain beta-carotene which may help slow the aging process, reduce the risk of certain types of cancer, improve lung function, and reduce complications associated with diabetes.

Swiss chard contains lutein which may reduce the risk of cataracts and macular degeneration. Swiss chard also contains indoles and sulphoraphane which may help decrease the risk of certain types of cancer.

Tomatoes and cooked tomato products contain lycopene which may decrease risk for prostate cancer and heart disease. Tomato products such as ketchup, tomato juice, and spaghetti sauce are some excellent sources of lycopene.

Turnips contain indoles and sulphoraphane which may help decrease the risk of certain types of cancer.

Watercress contains indoles and sulphoraphane which may help decrease the risk of certain types of cancer.

Watermelon contains lycopene which may decrease risk for prostate cancer and heart disease.

Winter squash contains beta-carotene which may help slow the aging process, reduce the risk of certain forms of cancer, improve lung function, and reduce complications associated with diabetes. Winter squash also contains zeaxanthin which may help to prevent macular degeneration, which is the leading cause of visual impairment in people over 50.