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# *Phytochemical supplements.*

Soy isoflavones
Beta-sitosterol
Capsaicin

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|---|---|---|
| Omega-3 Fatty Acids | Omega 3 Fish Oil | Free Radical Sc |
| Source Of Antioxidants | Antioxidant Vitamins | Fatty Acid Supp |
| Antioxidant Supplements | Vitamin B | Omega-3 |

**Phytochemicals** are substances **that plants** naturally produce to protect themselves against viruses, bacteria, and fungi.

There are over 900 phytochemicals found in foods, and one serving of a fruit or vegetable may have as many as 100 different phytochemicals.

Many phytochemicals are antioxidants that impart bright colors to fruits and vegetables.
Lutein makes corn yellow, lycopene makes tomatoes red, carotene makes carrots orange and anthocyanin makes blueberries blue.
Both the bright colors and the antioxidant activities are due to alternating single-bonded and double-bonded carbons.
Phytochemicals including carotenoids, flavonoids, indoles, isoflavones, capsacin, and protease inhibitors.
Phytochemicals are sometimes referred to as phytonutrients and these terms are often used interchangeably.
Phytochemicals exhibit diversified physiologic and pharmacologic effects.
They have been found to inactivate cancer-causing substances, stimulate the immune system, protect the heart from disease, and help prevent cataracts.
Phytochemicals promote human health by strengthening the human immune system and blood vessels, by fighting tumors, and through other activities.

Many of these non-nutritive substances have potent biological activity and may help to lower risk for many chronic diseases.
Soybeans contain a variety of phytochemicals and are the only food source with nutritionally significant amounts of one type of phytochemical called isoflavones.

**Carotenoids** - Carotenoids are natural fat-soluble pigments found in certain plants.
Carotenoids may be classified as hydrocarbon carotenes or xanthophylls, which are oxygenated derivatives of carotenes.
Representative examples of carotenes include β-carotene, alpha-carotene, and lycopene.
Examples of xanthophylls include lutein, astaxanthin, canthaxanthin, zeaxanthin, and capsorubin.
Lycopene, lutein, zeaxanthin, phytoene, phytofluene and beta-carotene belong to this family.
Carotenoids are converted to vitamin A mainly in the intestine and liver.
Many carotenoids are antioxidants that protect cells against free radicals by neutralizing them before they cause oxidative damage.

**Chlorophyll** - Chlorophyll is the green pigment which is responsible for the green colour in most plants.
Chlorophyll absorbs most in the red and blue portions of the electromagnetic spectrum, thus its intense green color.
There are several kinds of chlorophyll, the most important being chlorophyll which makes up about 75 % of the chlorophyll in green plants.
Chlorophyll has anti-inflammatory, antioxidant, and wound-healing properties.
Chlorophyll and chlorophyll are able to form tight molecular complexes with certain chemicals known or suspected to cause cancer.

**Dietary fiber** - Dietary fiber is the component in food not broken down by native enzymes and secretions of the gastrointestinal tract but which may be metabolized by the bacteria in the lower gut.
Dietary fiber is widely recognized an important part of the treatment and prevention of diabetes, colorectal cancer, gastrointestinal disorders, high cholesterol, heart disease and obesity.
There are many types of soluble fiber supplements: beta-glucan, psyllium, methylcellulose, pectins, vegetable gums and polycarbophil.
Soluble fiber is found in some fruits (particularly oranges, also apples and bananas), oats, legumes, (peas, soybeans, and other beans), other vegetables, such as broccoli and carrots, and psyllium seed.

**Flavonoids** - Flavonoids are natural polyphenolic molecules common to most flowering plants, they include flavonols, flavones, flavanones, isoflavones, catechins, anthocyanidins and chalcones.
Although not considered vitamins, flavonoids have a number of nutritional functions have been described as biological response modifiers; most act as antioxidants, and some have anti-inflammatory properties.
Quercetin is a flavonoid that serves as the backbone for many other flavonoids, including the citrus flavonoids rutin, quercitrin, and hesperidin.

**Resveratrol** - Resveratrol is a natural compound found in grapes, mulberries, peanuts, and other plants or food products, especially red wine.
Resveratrol is a fat-soluble compound that occurs in a trans and a cis configuration.
It functions as an antioxidant and thus could hamper free radical damage linked to cancer.
Resveratrol has several activities that may account for its possible cardioprotective action.
These include inhibition of the oxidation of low-density lipoprotein

(LDL), inhibition of smooth muscle cell proliferation and inhibition of platelet aggregation.

**Isoflavones** - Isoflavones are a unique class of plant flavonoids that have a limited distribution in the plant kingdom and can be physically described as colorless, crystalline ketones.
The most common and important dietary source of these isoflavones are soybeans.
Soy isoflavones are phytoestrogens which are plant-derived nonsteroidal compounds that possess estrogen-like biological activity.
Isoflavones acts as antioxidants to counteract damaging effects of free radicals in tissues.
Isoflavones may reduce the risk of hormone-dependent cancers.

**Ajoene** - Ajoene is a chemical compound available from garlic (Allium sativum).
It functions as an antioxidant, by inhibiting the release of superoxide.
Ajoene also has antithrombotic (anti-clotting) properties, which helps prevent platelets in the blood from forming blood clots, potentially reducing the risk of heart disease and stroke in humans.
Ajoene is also known to have effective broad-spectrum antimicrobial (antibacterial and antifungal) properties, helpful in preventing yeast infection (Candida albicans) and treating athlete's foot (tinea pedis), for example.
Ajoene has even been shown effective in inhibiting tumor cell growth by targeting the microtubule cytoskeleton of such cells.

**Isothiocyanates** - Isothiocyanates are sulfur-containing compounds which are largely responsible for the typical flavor of cruciferous vegetables.

In animals and humans they are conjugated with glutathione.
Isothiocyanates are responsible for the hotness of horseradish, radish

and mustard. Isothiocyanates also stimulate enzymes that convert estrogen to a more benign form and may block steroid hormones that promote breast and prostate cancers.

**Capsaicin** - Capsaicin is an alkaloid irritating to the skin and mucous membranes, the pungent active principle in capsicum, used as the active ingredient in a cream as a counterirritant and topical analgesic.
Capsaicin is the active component of chili peppers (Capsicum).
It is an irritant to mammalian epithelial cells and produces a burning sensation in the mouth, which some people enjoy.
Plants produce the compound to deter predation.
Capsaicin is used in topical ointments used to relieve the pain of peripheral neuropathy (for example post-herpetic neuralgia).

**Saponins** - Saponins are a group of plant constituents known as glycosides that have a distinctive foaming, soapy characteristic.
As a glycoside, a saponin can have water-binding properties for skin.
There is some evidence that saponins can have antimicrobial benefit for skin.
Saponins are believed to be useful in the human diet for controlling cholesterol, but some (including those produced by the soapberry) are poisonous if swallowed and can cause urticaria (skin rash) in many people.

**Phytosterols** - Phytosterols are essentially plant fats that include beta-sitosterol and its glucoside beta-sitosterolin.
Phytosterols are plant sterols structurally similar to cholesterol that act in the intestine to lower cholesterol absorption.
Phytosterols are naturally occurring plant compounds that are chemically similar to cholesterol.
Some phytosterols are not absorbed by the digestive tract.