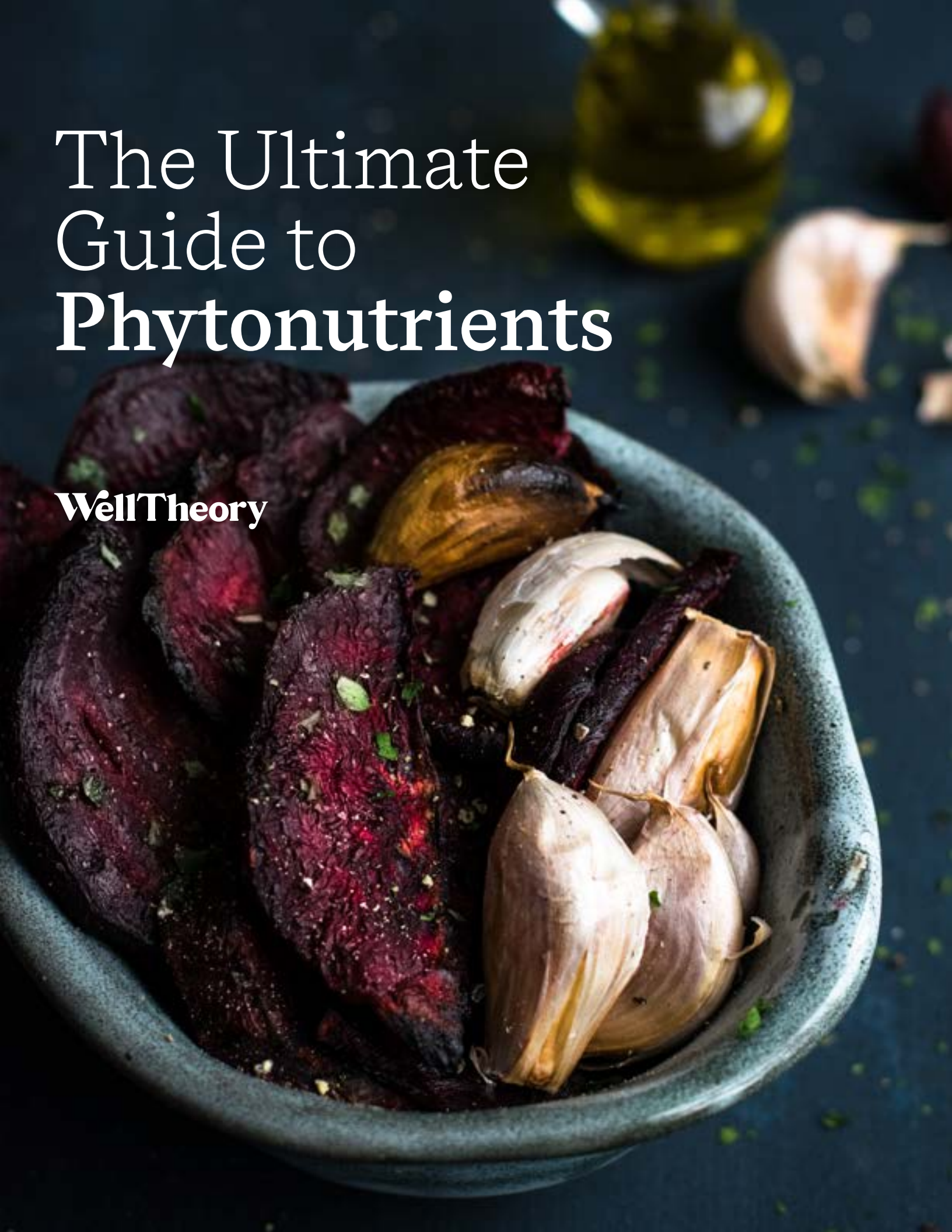


The Ultimate Guide to Phytonutrients

WellTheory



What is WellTheory?

WellTheory combines community care, dietary and lifestyle changes and personalized insights from your health data to support you no matter where you are in your autoimmune journey.

Join our membership at www.welltheory.com.

Phytonutrients, also known as phytochemicals, are bioactive compounds that are produced by plants. Readily available for consumption in fruits, vegetables, and grains, phytonutrients have been found to be beneficial for our health and have been linked to a reduced risk of a variety of major chronic diseases, such as type 2 diabetes, cancer, and cardiovascular diseases. Read on to find out what phytonutrients are, why they are so important to health, and how to include lots of beneficial phytochemicals in your diet. (31, 54)

What Are Phytonutrients?

Phytochemicals are chemical compounds produced by plants for protection against predators and environmental threats. Although they are not critical for our health the same way vitamins and minerals are, there is evidence phytochemicals offer health benefits when we consume them, so we call them phytonutrients. (46, 23)

Is There a Downside to Phytonutrients?

While the immune system requires a variety of nutrients to properly function and nutrient deficiencies may play a role in the development of autoimmune disease, some people with autoimmune disease may benefit from omitting certain foods from their diet.

Some of these foods — many of which are nutrient-dense — contain inflammatory compounds that outweigh their nutrient density or other benefits. For example, nightshades such as tomatoes and eggplants are omitted during the Autoimmune Protocol (AIP) diet elimination phase.

Our Nutritional Therapy Practitioners are specifically trained to help guide you through an elimination protocol such as AIP. More importantly, our foundational approach revolves around addressing digestive imbalances and gut health so that you may reintroduce as many foods as possible. A diverse diet is always the end goal!

What Are the Health Benefits of Phytonutrients?

Phytonutrients are produced by plants to protect them from disease, predation, and harmful environmental conditions, so it isn't surprising that the health benefits they offer us fall along the same lines. Thousands of phytonutrients have been discovered so far, and research has uncovered several ways they may be used to treat and prevent disease and chronic health problems.

Phytonutrients as Antioxidants

The antioxidant properties of many phytonutrients help keep oxidants and free radicals in check. Our body is constantly exposed to oxidizing agents and free radicals. They are present in the air, food, water, and are produced by metabolic processes in our cells.

Free radicals are a double-edged sword. Low to moderate levels can help fight pathogens and boost immune function. However, they can also accumulate in the body and lead to oxidative stress, damaging DNA, proteins, and fatty tissue. Oxidative stress plays a role in the development of autoimmune and other diseases. (37, 32, 51, 34)

Phytonutrients as Anti-Inflammatories

Inflammation is our body's biological response to infection, injury, or irritation. However, chronic inflammation can give rise to autoimmune diseases such as rheumatoid arthritis and diabetes. Research has found that phytonutrients are effective inhibitors of chronic inflammatory processes in the immune system. (58,44)

Phytonutrients as Antimicrobials

Many phytonutrients are produced by plants to defend themselves against pathogens. These compounds also have antibacterial, antifungal, and antiviral effects against pathogens that humans come into contact with. Researchers have begun harnessing these antimicrobial effects to develop methods of fighting antibiotic-resistant bacteria. (6)

Phytonutrients as Hormone Regulators

Some phytonutrients may behave like hormones. For example, phytoestrogens are naturally occurring plant compounds that mimic estrogen. Estrogen regulates the reproductive organs in the body, growth of healthy bones, and the breaking down of fats in the liver. When phytoestrogens are consumed, they may have a similar effect to estrogen produced by the body. (28)

Phytonutrients and Food Color

Phytonutrients in plants also act as pigments, giving fruits and vegetables their characteristic colors. Each color is caused by specific phytonutrients, for example, anthocyanins are responsible for the colors blue and purple, while carotenoids are responsible for yellow and red. (7)



Phytonutrients in Red Foods

Lycopene is the phytochemical that gives fruits and vegetables their red color. Lycopene is a potent antioxidant and has anti-inflammatory properties that protect the body from oxidative stress. Lycopene has also been found to decrease “bad” low density lipoprotein (LDL) and increase “good” high density lipoprotein (HDL) cholesterol. (24)

Lycopene may also protect the skin against ultraviolet (UV) damage from the sun. One small study found that participants who added 16 milligrams of lycopene to their diet every day had less severe skin reactions to UV light over 10 weeks than a control group without the added lycopene. (Of course, consumption of lycopene-rich foods doesn’t replace sunscreen!) (45)

AIP-Compliant Red Foods and Their Phytonutrient Compounds

Blood Orange

flavonoids, hesperidin, isohesperidin, limonene, limonin, lycopene, naringin, terpenio

Cherry

anthocyanin, flavonoids, hydroxycinnamates

Cranberry

anthocyanin, catechins, ellagic acid, hippuric acid, kaempferol, lycopene, triterpenoids, quercetin, quinic acid

Gac

beta-carotene, lutein, lycopene, polyphenols

Pomegranate

anthocyanin, cyanidin, ellagic acid, lycopene

Watermelon

cucurbitacin E, beta-carotene, lycopene

Red Grape

anthocyanin, cyanidin, ellagic acid, flavonols, kaempferol, lycopene, myricetin, peonidin, quercetin, resveratrol

Pink Guava

alkaloids, ellagic acid, lycopene

Red/Pink Grapefruit

beta-cryptoxanthin, lycopene, naringin, narirutin, ponciri

Red Onion

copaene, flavonols, lycopene, polysulfides, quercetin, vinylthiols

Red Beet

betacyanin, flavonoids, lycopene, phenolic acids

Rose Hip

anthocyanin, beta-cryptoxanthin, flavonoids, glycosides, rubixanthin, terpenoids

Other Red Foods and Their Phytonutrient Compounds

Tomato

beta-carotene, kaempferol, lycopene, rutin

Red Bell Pepper

anthocyanin, capsaicinoid, beta-cryptoxanthin, lutein, lycopene, zeaxanthin

Paprika

beta-carotene, canthaxanthin, lycopene, tocopherols

Red Potato

alpha linoleic acid, anthocyanin, flavonoids, polyphenols, tocopherols

Goji/Wolfberry

beta-carotene, lycopene, zeaxanthin

Ways to incorporate more red foods into your diet

- Add red-colored fruits and vegetables to salads.
- Opt for red pasta sauces made from tomatoes instead of carbonara or Alfredo sauce. Red sauces can also be used as toppings for other dishes!
- Have salsa as a dip alongside tortilla chips or eggs, or on top of potatoes.
- Make a juice using lycopene-rich foods.
- Add some goji berries to your chrysanthemum, chamomile, or any other tea.





Phytonutrients in Orange Foods

Carotenoids are responsible for yellow, orange, and red color in many fruits and vegetables. Research suggests that one carotenoid in particular, beta-carotene, may protect against decline in lung function. A study done in 2017 also suggested that eating fruits and vegetables rich in carotenoids such as beta-carotene, alpha-carotene, and beta-cryptoxanthin had protective effects against lung cancer. (17, 42)

Like lycopene, dietary intake of beta-carotene has protective effects against diseases that are mediated by oxidative stress, such as diabetes, cancer, and autoimmune diseases. High levels of alpha-carotene are associated with longevity — one large U.S. study found that high levels of alpha-carotene in the blood were linked with a reduced risk of death over a 14 year period. Aside from its antioxidant effects, the carotenoid beta-cryptoxanthin may prevent bone loss and may have anti-inflammatory and anticancer properties. (14, 29, 25)

AIP-Compliant Orange Foods and Their Phytonutrient Compounds

Apricot

beta-carotene, lycopene, rutin, tartaric acid

Butternut Squash

alpha-carotene, beta-carotene, beta-cryptoxanthin, lutein, phenolic acids, zeaxanthin

Cantaloupe

beta-carotene, beta-cryptoxanthin, gallic acid, kaempferol, lutein, zeaxanthin

Carrot

alpha-carotene, beta-carotenes, beta-cryptoxanthin, caffeic acid, chlorogenic acid, lycopene

Mandarin Oranges

alpha-carotene, beta-carotene, beta-cryptoxanthin, flavonoids, lutein, zeaxanthin

Mango

beta-carotene, beta-cryptoxanthin, beta-glucogallin, ellagic acid, quercetin

Orange

beta-carotene, beta-cryptoxanthin, flavonoids, hesperidin, isohesperidin, naringin, terpineol, limonene, limonin

Papaya

beta-cryptoxanthin, lutein, zeaxanthin

Peach

alpha-carotene, anthocyanidins, beta-carotene, beta-cryptoxanthin, phenolic acids, rutin

Persimmon

beta-carotene, beta-cryptoxanthin, catechin, kaempferol, proanthocyanidins, quercetin, triterpenoid

Pumpkin

alpha-carotene, beta-carotene, beta-cryptoxanthin, lutein, phenolic acids, phytic acid, zeaxanthin

Sea Buckthorn

beta-carotene, beta-cryptoxanthin, lutein, lycopene, quercetin, zeaxanthin

Sweet potato

alkaloids, anthocyanin, beta-carotene, flavonoids, oxalic acid, phenolic acids

Tangerine

alpha-carotene, beta-carotene, lutein, lycopene, tangeritin, zeaxanthin

Turmeric

curcumin, curcumenol, demethoxycurcumin, eugenol, turmerin, turmerones, zingiberene

Winter Squash

alpha-carotene, beta-carotene, beta-cryptoxanthin, lutein, zeaxanthin

Yam

alkaloids, beta-carotene, flavonoids, phenol

Other Orange Foods and Their Phytonutrient Compounds

Orange Lentils

beta-carotene, flavonoids, phytic acid, tocopherols, flavonols

Orange Bell Pepper

beta-carotene, lycopene, capsaicinoid, lycopene, phenols

Ways to incorporate more orange foods into your diet

- Have a baked sweet potato instead of white potato.
- Add turmeric powder to stir-fries, or make a warm cup of ginger and turmeric tea.
- Have orange-colored foods as a snack throughout the day, such as tangerines, papaya, or peaches.
- Make a pumpkin, butternut squash, or carrot soup.
- Make a smoothie out of orange-colored foods.





Phytonutrients in Yellow Foods

Lutein and zeaxanthin are also part of the carotenoid family, along with beta-carotene, alpha-carotene, and beta-cryptoxanthin. Lutein and zeaxanthin are the only dietary carotenoids that reach the retina, the thin layer of tissue that lines the inside on the back of the eye. They are known to support eye health and have preventative effects against age-related macular degeneration, an eye disease that can lead to the loss of vision as we age. However, lutein and zeaxanthin also have strong antioxidant and anti-inflammatory capabilities. Zeaxanthin can also help to recycle glutathione, another important antioxidant in the body. (9, 15)

AIP-Compliant Yellow Foods and Their Phytonutrient Compounds

| | | | | | |
|---|--|--|--|---|--|
| <p>Yellow Apple</p> <p>catechin, chlorogenic acid, flavonols, quercetin, rutin</p> | <p>Avocado</p> <p>beta-cryptoxanthin, lutein, tartaric acid</p> | <p>Banana</p> <p>beta-carotene, lutein, oxalic acid, zeaxanthin</p> | <p>Golden Beet</p> <p>beta-carotene, beta-cryptoxanthin, flavonoids, lutein, phenolic acids, zeaxanthin, flavonoids</p> | <p>Yellow Cauliflower</p> <p>beta-carotene, polyphenols, protocatechuic acid, quercetin</p> | <p>Yellow dragon fruit</p> <p>betacyanin, beta-carotene, flavonoids, lutein, phenolic acid, zeaxanthin, phenolic acid</p> |
| <p>Durian</p> <p>alpha-carotene, anthocyanin, beta-carotene, flavonoids, lutein, polyphenols, zeaxanthin</p> | <p>Eggfruit</p> <p>alkaloids, beta-carotene, biolaxanthin, gallic acid, neoxanthin, quercetin, terpenoids, zeaxanthin</p> | <p>Ginger</p> <p>gingerol, monoterpenes, oxalic acid, quercetin</p> | <p>Golden Kiwi</p> <p>beta-carotene, beta-cryptoxanthin, caffeic acid, chlorogenic acid, lutein, phenolics, quinic acid, zeaxanthin</p> | <p>Jackfruit</p> <p>alkaloids, alpha-carotene, beta-carotene, flavonoids, lignans, lutein, phenolics, terpenoids, zeaxanthin</p> | <p>Lemon</p> <p>alkaloids, beta-cryptoxanthin, flavonoids, phenols, quinines, rutin, terpenoids</p> |
| <p>Nectarine</p> <p>anthocyanin, beta-carotene, phenols</p> | <p>Yellow Pear</p> <p>beta-carotene, caffeic acid, pectin, quercetin, tocopherols</p> | <p>Plum</p> <p>anthocyanin, beta-cryptoxanthin, lutein</p> | <p>Rutabaga/Swedish Turnip</p> <p>beta-carotene, indole-3-carbinol, lutein, luteolin</p> | <p>Summer Squash</p> <p>beta-carotene, beta-cryptoxanthin, lutein, zeaxanthin</p> | <p>Star Fruit</p> <p>alkaloids, flavonoids, phenolics, phytofluene</p> |
| <p>Pineapple</p> <p>alkaloids, beta-carotene, beta-cryptoxanthin, chlorogenic acid</p> | <p>Plantain</p> <p>beta-carotene, lutein, zeaxanthin</p> | <p>Yellow Watermelon</p> <p>beta-carotene, beta-cryptoxanthin, lutein, zeaxanthin</p> | <p>Yellow Zucchini</p> <p>alpha-carotene, beta-carotene, lutein, zeaxanthin</p> | | |

Other Yellow Foods and Their Phytonutrient Compounds

| | | | |
|--|--|---|--|
| <p>Yellow bell pepper</p> <p>beta-carotene, capsaicinoid, lutein, phenols, zeaxanthin</p> | <p>Corn</p> <p>anthocyanin, beta-carotene, flavonoids, phenolic acids</p> | <p>Millet</p> <p>beta-carotene, lutein, zeaxanthin, ferulic acid, caffeic acid, chlorogenic acid</p> | <p>Yellow Potatoes</p> <p>beta-carotene, lutein, zeaxanthin, flavonoids, phenols, anthocyanin</p> |
|--|--|---|--|

Ways to incorporate more yellow foods into your diet

- Add diced yellow bell peppers and corn to your stir-fry.
- Make honey and lemon tea.
- Make stove-top popcorn with healthy fats such as olive oil and coconut oil.
- Roast, bake, or mash yellow (Yukon) potatoes instead of white potatoes.
- Use bananas to make banana pancakes and bread.
- Slide some banana into your oatmeal.
- Blend frozen pineapple, almond milk, and honey or maple syrup to make pineapple sorbet.





Phytonutrients in Green Foods

Dark green, leafy cruciferous vegetables are a good source of sulfur (isocyanate, sulforaphane, glucosinolate). Our body needs sulfur in order to synthesize certain essential proteins. These sulfur compounds break down into isothiocyanates and indoles in the gut, which are known to have antibacterial, antiviral, antifungal, and anti-inflammatory effects. (36, 52, 33)

Research suggests that sulforaphane may support heart health by reducing inflammation and lowering blood pressure. It may also have antidiabetic effects. One study found that sulforaphane reduced fasting blood sugar in patients with type 2 diabetes. (55, 41, 47)

Glucoraphanin, a glucosinolate that's found in some cruciferous vegetables, has been found to protect the blood-brain barrier in mice with induced experimental autoimmune encephalomyelitis (used to study MS, which can't be induced in the same way), suggesting it may reduce the risk of developing MS. (16, 40)

AIP-Compliant Green Foods and Their Phytonutrient Compounds

| | | | | | |
|---|---|--|---|--|---|
| <p>Artichoke</p> <p>cynarin, gallic acid, quercetin, rutin, silymarin</p> | <p>Arugula</p> <p>glucosinolates, indole-3-carbinol, lutein, sulforaphane, thiocyanates, zeaxanthin</p> | <p>Asparagus</p> <p>lycopene, rutin, glutathione, quercetin, caffeic acid, kaempferol, ferulic acid</p> | <p>Bitter Gourd</p> <p>anthraquinones, beta-carotene, glucosinolates, isoflavones, lutein, phenolic acids, sterol,</p> | <p>Bok Choy</p> <p>beta-carotene, flavonoids, glucosinolates, kaempferol, lutein</p> | <p>Broccoli</p> <p>alpha-carotene, beta-carotene, glucosinolates, kaempferol, lutein, sulforaphane</p> |
| <p>Brussel Sprouts</p> <p>indole-3-carbinol, isoflavonoids, isothiocyanate, kaempferol, lutein, zeaxanthin</p> | <p>Cabbage</p> <p>beta-carotene, chlorogenic acid, indole-3-carbinol, lutein, sulforaphane, tocopherol</p> | <p>Collards</p> <p>beta-carotene, lutein, indole-3-carbinol, isothiocyanates, sulforaphane, zeaxanthin</p> | <p>Zucchini</p> <p>beta-carotene, lutein, zeaxanthin</p> | <p>Gai Lan/ Chinese Broccoli/ kale</p> <p>beta-carotene, carbinol, chlorophyll, indole-3-carbinol, lutein, sulforaphane, zeaxanthin</p> | <p>Honey Dew Melon</p> <p>beta-carotene, caffeic acid, ellagic acid, ferulic acid, gallic acid, kaempferol, lutein, terpenes</p> |
| <p>Horseradish</p> <p>glucosinolates, lutein, polysulfides, zeaxanthin</p> | <p>Kale</p> <p>beta-carotene, glucosinolates, indole-3-carbinol, kaempferol, lutein, zeaxanthin</p> | <p>Kiwi</p> <p>anthocyanin, beta-carotene, beta-cryptoxanthin, flavonoids, lutein</p> | <p>Kohlrabi</p> <p>anthocyanin, beta-carotene, glucosinolates, isothiocyanate</p> | <p>Leek</p> <p>allicin, alliin, beta-carotene, gallic acid, isothiocyanate, kaempferol, lutein</p> | <p>Lettuce</p> <p>beta-carotene, chlorophyll, lutein, zeaxanthin</p> |
| <p>Mustard Greens</p> <p>glucosinolate, beta-carotene, lutein, zeaxanthin, phenolic acids, anthocyanin</p> | <p>Okra</p> <p>beta-carotene, chlorophyll, flavonoids, lutein, phytosterols, zeaxanthin</p> | <p>Perilla</p> <p>apigenin, beta-carotene, caffeic acid, citral, dillapiole, elemicin, limonene, luteolin, myristicin</p> | <p>Spinach</p> <p>beta-carotenes, lutein, quercetin, zeaxanthin</p> | <p>Swiss Chard</p> <p>catechin, epicatechin, kaempferol, lutein, myricetin, quercetin, zeaxanthin</p> | <p>Watercress</p> <p>beta-carotene, glucosinolates, lutein, zeaxanthin</p> |

Other Green Foods and Their Phytonutrient Compounds

| | |
|--|--|
| <p>Coriander</p> <p>apigenin, caffeic acid, chlorogenic acid, chlorophyll, flavonoids, kaempferol</p> | <p>Pistachios</p> <p>anthocyanin, beta-carotene, chloroform, lutein, phytosterols, violaxanthin</p> |
|--|--|

Ways to incorporate more green foods into your diet

- Add chopped spinach and asparagus to an omelet or frittata.
- Make a green smoothie using a variety of green vegetables and fruits.
- Make kale chips using green kale.
- Use basil or any dark green vegetable of your choice to make a pesto sauce.
- Dip cucumbers in hummus, or celery in peanut butter.
- Make wraps using lettuce leaves, cabbage leaves, perilla leaves, or Swiss chard.
- Sauté your choice of green vegetables with garlic, lemon, and olive oil.





Phytonutrients in Blue/Purple/ Black Foods

Anthocyanins are phytochemicals that give red, blue, and purple plants their vibrant coloring. Anthocyanins have antioxidant properties that may boost heart health and reduce the risk of developing cardiovascular-related and other chronic diseases. (26)

Anthocyanin-rich foods have been linked to reductions in inflammation and reduced blood sugar concentrations, suggesting they may also have antidiabetic effects. Anthocyanins have also been found to protect eye health. One study found that daily supplementation with pharmaceutical anthocyanins improved the visual function of individuals with normal tension glaucoma (where the optic nerve is damaged despite pressure in the eye being normal). (30, 43)

Other phytochemicals called stilbenoids are typically found in grapes and blueberries. Like anthocyanins, stilbenoids have been shown to have a variety of benefits such as protective effects on the heart and brain, as well as antidiabetic, anticancer, and anti-inflammatory properties. (4)

AIP-Compliant Blue/Purple/Black Foods and Their Phytonutrient Compounds

| | | | | | |
|--|--|---|--|--|---|
| Purple Asparagus | Purple Basil | Bilberry | Blackberries | Blueberries | Purple Cabbage |
| anthocyanin, beta-carotene, ecdysterone, lutein, zeaxanthin | anthocyanin, beta-carotene, kaempferol, myrcene, phenolic acids, quercetin, rutin, terpinolene | anthocyanin, caffeic acid, chlorogenic acid, kaempferol, myricetin, quercetin, terpenoids | anthocyanin, beta-carotene, lutein, salicylic acid, zeaxanthin | anthocyanin, catechins, ferulic acid, gallic acid, myricetin, phenolic acids, quercetin, stilbenoids | anthocyanin, beta-carotene, flavonoids, glucosinolates, indole-3-carbinol, lutein, sulforaphane, zeaxanthin |
| Purple Cauliflower | Purple Carrots | Black Currants | Elderberries | Fig | Purple Grapes |
| anthocyanin, beta-carotene, glucosinolates, indole-3-carbinol, lutein, sulforaphane, zeaxanthin | alpha-carotene, anthocyanin, beta-carotene, caffeic acid, chlorogenic acid, lutein, zeaxanthin | anthocyanin, caffeic acid, kaempferol, phenolic acids, lignans, myricetin, quercetin | anthocyanin, flavonoids, polyphenols | anthocyanin, beta-carotene, chlorogenic acid, lutein, rutin, zeaxanthin | anthocyanin, beta-carotene, caffeic acid, catechins, coumaric acid, ellagic acid, ferulic acid, kaempferol, lutein, myricetin, quercetin, stilbenoids, zeaxanthin |
| Purple Kale | Plum | Radicchio | | | |
| anthocyanins, beta-carotene, flavonoids, glucosinolates, indole-3-carbinol, lutein, sulforaphane, zeaxanthin | anthocyanin, chlorogenic acid, lutein, phytosterols, sorbitol, terpenoids, zeaxanthin | anthocyanin, ellagic acid, lutein, lycopene, quercetin, zeaxanthin | | | |

Other Blue/Purple/Black Foods and Their Phytonutrient Compounds

| | | |
|--|---|--|
| Chia Seeds | Rice | Eggplant |
| caffeic acid, quercetin, myricetin, phenolic acids, chlorogenic acid | phenolic acids, tocopherols, flavonoids, anthocyanin, phytosterols, phytic acid | anthocyanin, auberginone, flavonoids, glycoalkaloids, phenolic compounds |

Ways to incorporate more blue/purple/black foods into your diet

- Substitute purple cabbage, carrots, and onions for green cabbage, orange carrots, and white onions.
- Add blueberries, blackberries, black currants, figs, and plums to yogurt or oatmeal.
- Have a baked purple sweet potato instead of white potato, or use them to make sweet potato patties.
- Make sauerkraut using purple cabbage.
- Use purple vegetables in salads.
- Make a cannelloni using eggplant.





Phytonutrients in White/Tan/ Brown Foods

Allicin, a phytochemical produced when garlic is chopped or crushed, has been associated with a lower risk of coronary events in older adults. Research suggests allicin may help reduce LDL and total cholesterol levels when consumed for more than 2 months. (8, 39)

Garlic is well known for its antimicrobial effects and has historically been used to combat infectious diseases. It is also known to be effective against a variety of bacteria, such as *Salmonella*, *Escherichia coli*, and *Staphylococcus aureus*. (8)

Another phytonutrient that is found in many white, tan, and brown foods is quercetin. Quercetin has anti-inflammatory properties and may be effective against obesity, cancer, viruses, allergies, and high blood pressure. (5)

Serum C-reactive protein (CRP) levels are a biomarker of inflammation in the body. High CRP levels are associated with heart disease, obesity, and lupus. One study done in 2008 found that intake of foods rich in flavonoids, such as quercetin, is associated with lower serum CRP concentrations. (12)

AIP-Compliant White/Tan/Brown Foods and Their Phytonutrient Compounds

Cauliflower

beta-carotene, flavonoids, glucosinolates, indole-3-carbinol, lutein, sulforaphane, zeaxanthin

Dates

beta-carotene, flavonoids, lutein, phenolic acids, zeaxanthin

Japanese Turnip

anthocyanins, beta-carotene, ferulic acid, glucosinolate, lutein, quercetin, violaxanthin

Garlic

allicin, alliin, caffeic acid, ferulic acid, kaempferol, polysulfides, quercetin, triterpenoid

Ginger

gingerols, paradols, shogaols, terpenes

Lotus Root

catechins, catechol, gallic acid, phenolic acids

Lychee

anthocyanidins, catechins, malvidin, quercetin, rutin

Mangosteen

catechins, gartanin, mangostin, normagostin, rosin, xanthenes

Mushroom

beta-glucans, ergosterol, ganoderic acid, lucidenic acid

Olives

hydroxytyrosol, oleuropein

Onion

allicin, alliin, caffeic acid, ferulic acid, fumaric acid, phytosterols, quercetin, rutin

Taro

alkaloids, flavonoids, glycosides, phenols, quercetin, terpenoids

Other White/Tan/Brown Foods and Their Phytonutrient Compounds

Almonds

catechin, kaempferol, methylquercetin, protocathechuic acid, p-hydroxybenzoic acid, resveratrols, vanillic acid

Cacao

caffeine, flavonols, quercetin, theobromine

Hazelnut

caffeoylquinic acid, gallic acid, kaempferol, myricetin, quercetin

Legumes

flavonoids, lutein, phenolic acids, tocopherols, zeaxanthin

Sesame

lignans, phytosterols, sesamin, sesamol, tocopherols

Soy

beta-sitosterol, daidzein, genistein, isoflavone

Walnuts

gallic acid, phenolic acids, phytosterol, proanthocyanidins

Whole Grains

beta-cryptoxanthin, flavonoids, lutein, zeaxanthin

White Potatoes

flavonoids, phenolic acids, beta-carotene, chlorogenic acid

Coffee

beta-carotene, caffeine, chlorogenic acid, phenolic acids

Flaxseed

campesterol, lignans, triterpenes, sitosterol, stigmasterol

Ways to incorporate more white/tan/brown foods into your diet

- Use dates instead of refined sweeteners to sweeten a dish or drink.
- Add onions and mushrooms to a stir-fry.
- Make your own granola or trail mix using whole grains, nuts, and seeds.
- Stir-fry lotus root with bell peppers and garlic sauce.
- Add cacao to smoothies, yogurt, or oatmeal.
- Pickle some Japanese turnip to have as a snack or side dish.



The Bottom Line on Phytonutrients

The thousands of phytochemicals produced by plants for their own protection may also help prevent and treat many of our own medical conditions and diseases. Phytonutrients give fruits, vegetables, grains, nuts, and other plant foods their variety of colors, so “eat the rainbow” to maximize the health benefits offered by these plentiful chemical compounds.



Going grocery shopping?

Take this AIP-friendly, phytonutrient-rich list on your next trip to the grocery store.



RED

| | | |
|--------------|----------------|-------------|
| Beet | Radishes | Red pear |
| Blood orange | Red grape | Pomegranate |
| Cherry | Red grapefruit | Rose hip |
| Cranberry | Pink guava | Watermelon |
| Gac | Red onion | |



ORANGE

| | | |
|------------|---------------|---------------|
| Cantaloupe | Persimmon | Tangerine |
| Carrots | Pumpkin | Turmeric |
| Mango | Sea buckthorn | Winter squash |
| Papaya | Sweet potato | Yam |
| Peach | Squash | |



YELLOW

| | | |
|--------------|-------------|-------------|
| Avocado | Durian | Lemon |
| Yellow apple | Eggfruit | Nectarine |
| Banana | Ginger | Yellow pear |
| Golden beet | Golden kiwi | Rutabaga |
| Dragon fruit | Jackfruit | |



GREEN

| | | |
|--------------|-----------------|----------------|
| Algae | Bok choy | Kiwi |
| Artichoke | Brussel sprouts | Kohlrabi |
| Arugula | Collards | Mustard Greens |
| Asparagus | Coriander | Okra |
| Bitter gourd | Gai lan | Perilla |



BLUE/PURPLE/BLACK

| | | |
|----------------|----------------|-------------|
| Purple basil | Purple carrots | Purple kale |
| Bilberry | Black currants | Plum |
| Blackberries | Elderberries | Radicchio |
| Blueberries | Fig | |
| Purple cabbage | Purple grapes | |



WHITE/TAN/BROWN

| | | |
|-------------|------------|--------|
| Cauliflower | Lotus root | Onion |
| Coconut | Lychee | Sesame |
| Dates | Mangosteen | |
| Garlic | Mushroom | |
| Ginger | Olives | |

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