

# So Good For You?

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*Find out what antioxidants are, why they're beneficial, and what the best sources are.*

Antioxidants have become a health buzzword. And the media and many marketing departments have seized the opportunity to tout their many supposed health benefits, claiming antioxidants can prevent cancer, protect against heart disease, slow aging, and more.

But beyond all the hype, what are antioxidants? How important are they? And what are their *proven* health benefits?

**Learn the truth about these compounds in food, and discover which antioxidant-rich foods will give you the most bang for your buck.**

## What Are Antioxidants? And How Do They Help Your Body?





To understand antioxidants, you first need to understand **free radicals** and **oxidation**.

*Free radicals are oxygen molecules that have split into single atoms with unpaired electrons. As they seek out other electrons, they damage cells and DNA. Free radicals are created by a process known as oxidation.*

Oxidation happens naturally as your cells process the oxygen you breathe and convert it into energy. It's a chemical reaction that also produces free radicals.

**Some free radicals are part of a healthy bodily system.** They cause damage which your body naturally repairs. But when there are too many of them, they overwhelm your body's natural repair processes and cause problems.

The trouble isn't with free radicals, per se — it's how many of them there are.

In addition to their natural presence in your body, *free radicals are significantly increased by external factors*, like fried foods, alcohol, tobacco smoke, pesticides, [pollutants in the air](https://foodrevolution.org/blog/taking-action/indoor-air-pollution-health/) (<https://foodrevolution.org/blog/taking-action/indoor-air-pollution-health/>), and eating a poor diet. **Basically, almost everything that's bad for you can increase your free radical load.**

The buildup of free radicals in your body is known as "[oxidative stress](https://www.drfuhrman.com/library/eat-to-live-blog/139/what-is-oxidative-stress/)" (<https://www.drfuhrman.com/library/eat-to-live-blog/139/what-is-oxidative-stress/>)."

Oxidative stress is [thought](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3614697/) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3614697/>) to be a **leading cause of deterioration and disease**, including memory loss, the breakdown of organs, autoimmune disorders, heart disease, type 2 diabetes, cæ and even wrinkles.

Brown spots on aging hands, for example, are due to oxidized fat underneath the skin.

And now, here's where **antioxidants** come into play. They are **the good guys** in the fight against free radicals. They neutralize them by giving them the electrons they need.

**Every day, your body creates free radicals, and you need to consume antioxidants in order to keep your system in balance.**

*A lack of antioxidants puts you at higher risk for a number of chronic diseases and other health issues. This is called "oxidative debt."*

## What's the Solution to Avoiding Oxidative Debt?

We need (<https://nutritionfacts.org/2014/12/04/how-to-get-enough-antioxidants-each-day/>) between 8,000 and 11,000 antioxidant units per day. But *more than half of Americans don't even get half* ([https://www.youtube.com/watch?v=yVjTKBw7\\_To](https://www.youtube.com/watch?v=yVjTKBw7_To)) the minimum required amount of antioxidants.

This deficiency may be part of the reason why oxidative-related diseases, such as heart disease, type 2 diabetes, and certain types of cancer, are so prevalent.

**The solution seems simple enough: We need to consume more antioxidants.**

## What Are the Different Kinds of Antioxidants?





There are hundreds (<https://www.hsph.harvard.edu/nutritionsource/antioxidants/>) of substances that act as antioxidants. These include widely discussed nutrients, like vitamins, as well as less well-known ones, like flavonoids and polyphenols.

And not all antioxidants operate exactly the same way. Some antioxidants excel at fighting certain types of oxidants, while others are effective only in specific parts of your cells. And some antioxidants only work under the right conditions.

*The human body naturally produces some antioxidants, such as melatonin, but most of them have to come from food.*

While all foods contain some antioxidants, plant foods are the primary source. **On average, plant foods contain** (<https://nutritionfacts.org/topics/antioxidants/>) **64 times more antioxidants than animal-based foods.**

These are some of the key antioxidants you may want to include in your diet:

- **Vitamin E** — While there are eight forms of the fat-soluble vitamin E, *α-tocopherol* is the most bioactive form of this antioxidant in humans. Top food sources include **spinach, kiwi, tomatoes, dandelion greens, hazelnuts, sunflower seeds, broccoli, and almonds.**
- **Vitamin C** — This crucial water-soluble antioxidant has actually been shown (<https://ods.od.nih.gov/factsheets/VitaminC-HealthProfessional/>) to *regenerate other antioxidants*. Top food sources include **Brussels sprouts, cauliflower, green and red peppers, cabbage, turnip greens, sweet and white potatoes** (<https://foodrevolution.org/blog/are-potatoes-healthy/>), **tomatoes, and winter squash.**
- **Beta-carotene** — This fat-soluble red/orange plant pigment combines with other elements to *form vitamin A in your body*. Top food sources include **carrots, sweet potatoes, winter squash, spinach, kale, cantaloupe, and apricots.**

- **Lycopene** — This fat-soluble antioxidant can mostly be found in red/pink-hued foods. The most significant source is **tomatoes**, but it's also found in **watermelon, pink grapefruit, pink guava, papaya, and goji berries**.
- **Selenium** — This important antioxidant is actually a mineral, and it originates in soil, where it's soaked up by growing plants. Top food sources include **Brazil nuts, brown rice, mushrooms** (<https://foodrevolution.org/blog/food-and-health/health-benefits-of-mushrooms/>), **oatmeal, and spinach**.
- **Polyphenols** — Another category of pigments, of which the largest group is called flavonoids. It includes subgroups like flavones (luteolin and apigenin), anthocyanidins (malvidin, pelargonidin, peonidin, and cyanidin), flavonones (hesperetin, eriodictyol, and naringenin), and isoflavones (genistein, glycitein, and daidzein). Top food sources include **romaine lettuce, blueberries, celery, tomatoes, peaches, apples** (<https://foodrevolution.org/blog/apple-health-benefits/>), **garbanzo beans, pears, oranges, almonds, strawberries, and watermelon**.
- **Omega-3 fatty acids** — These polyunsaturated fatty acids come in three forms: eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA), and alpha-linolenic acid (ALA). Some plant foods have ALA, but EPA and DHA are found mainly in fish and certain algae. The human body can convert ALA to EPA and DHA, though the efficiency of conversion varies from person to person. Some people are efficient converters and may do just fine if they eat plenty of ALA. Others benefit from a direct form of DHA and EPA — whether from fish, fish oil or from an [algae-based supplement](https://foodrevolution.org/complement) (<https://foodrevolution.org/complement>). The foods highest in ALA are **flax seeds (and flax oil) and chia seeds**. ALA levels are also high in **camelina oil**, and there are moderate amounts in **hemp seeds (and hemp oil), canola oil, and walnuts**.

## What Are the Real Health Benefits of Antioxidants?

Are we sure that antioxidants are good for you? Are there any studies to back it up?

Yes, there are. For example:

- A 2014 study [published](https://www.ncbi.nlm.nih.gov/pubmed/24311110) (<https://www.ncbi.nlm.nih.gov/pubmed/24311110>) in the journal *Molecular and Cellular Biochemistry* found that a diet high in antioxidant-rich foods from an early age can offer **protection against age-related macular degeneration (AMD) and glaucoma**.

- A 2012 study published (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3583892/>) in the journal *Dermato Endocrinology* comparing skin anti-aging techniques found that the consumption of antioxidants through food can **delay aging and improve skin condition**.
- A 2014 analysis published (<https://www.ncbi.nlm.nih.gov/pubmed/25252018>) in the journal *Current Opinion in Clinical Nutrition & Metabolic Care* found that dietary phytochemicals (most of which are antioxidants) can be beneficial for the **prevention of heart disease, diabetes, cancer, and dementia/cognition issues**.
- A 2016 study published (<https://www.ncbi.nlm.nih.gov/pubmed/25225771>) in the journal *Critical Reviews in Food Science and Nutrition* concluded that higher fruit and vegetable intake (and therefore higher antioxidant intake) is a “powerful tool” in **reducing the risk of cardiovascular disease, cancer, poor cognitive performance, and other diet-related diseases**.
- A 2003 study published (<https://academic.oup.com/ajcn/article/78/3/517S/4689990?referringRepId=yourcoachID>) in *The American Journal of Clinical Nutrition* found that increased consumption of antioxidants led to “**reduced risks of cancer, cardiovascular disease, stroke, Alzheimer disease, cataracts, and some of the functional declines associated with aging**.”

## If Antioxidants Are Beneficial, Are Antioxidant Supplements Worthwhile?





**Many antioxidants can be highly concentrated in supplements. How does that compare to eating them in food directly?**

In a 2004 study published (<https://www.ncbi.nlm.nih.gov/pubmed/15159237>) in the *American Journal of Clinical Nutrition*, researchers put some participants on a fruit and vegetable-heavy diet while giving others a supplement containing the same nutrients.

The study leaders concluded that *dietary intervention was better than the supplements at combating oxidative stress.*

**Foods contain a variety of antioxidants that work synergistically, so they tend to be more effective than supplements,** which offer isolated nutrients.

In fact, the majority of studies on antioxidant supplements have concluded (<https://nccih.nih.gov/health/antioxidants/introduction.htm>) that they provide few, if any, significant health benefits.

*And while taking a multivitamin and other nutritional supplements may be worthwhile if you're unable to eat certain foods or are deficient in a particular nutrient, high dose supplementation has risks.*

**Some antioxidants can be harmful when taken excessively in supplement form. For example:**

- Beta-carotene: A 1996 study published (<https://www.ncbi.nlm.nih.gov/pubmed/8635686>) in *The FASEB Journal* found that **beta-carotene supplements may actually increase lung cancer incidence in smokers.**

- Vitamin E: A 2005 meta-analysis published (<https://www.ncbi.nlm.nih.gov/pubmed/15537682>) in the journal *Annals of Internal Medicine* found that taking a daily dose of 200 IU of vitamin E per day presented no increased risk of death and suggested that it might benefit health. However, the researchers found that **for those taking daily doses of 400 IU or more, the risk of death was about 10% higher** than among those taking placebos.
- Selenium: High levels (<https://www.ncbi.nlm.nih.gov/pubmed/12041880>) of selenium have been linked to **diabetes** (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3022062/>), **high triglycerides**, **prostate cancer** (<https://www.ncbi.nlm.nih.gov/pubmed/19528373>), **heart disease** (<https://www.ncbi.nlm.nih.gov/pubmed/18196986>), and **issues with immune and thyroid function**.

## What Are the Top Antioxidant-Rich Foods, Herbs, and Spices to Add to Your Diet?



In a 2010 study published (<https://nutritionj.biomedcentral.com/articles/10.1186/1475-2891-9-3>) in *Nutrition Journal*, researchers measured the antioxidant concentration of more than 3,100 foods, including everything from nuts and seeds to breakfast and grilled chicken.



Their conclusion? **“Antioxidant-rich foods originate from the plant kingdom while meat, fish and other foods from the animal kingdom are low in antioxidants.”**

Here are 15 of the top antioxidant-rich foods and spices, and remember, *it's important to eat organic as much as possible because pesticides create (<https://www.ncbi.nlm.nih.gov/pubmed/15173684>) free radicals in our bodies:*

- **Clove** — A 2010 study published (<https://onlinelibrary.wiley.com/doi/abs/10.1002/ffj.1951>) in *Flavour and Fragrance Journal* found that **clove is the best natural antioxidant** thanks to its high levels of phenolic compounds. While often associated with the holidays, ground clove has a sweet-meets-savory flavor. You can use it in hummus, soups, and many other flavorful dishes.
- **Purple Cabbage** — This brightly colored (<https://foodrevolution.org/blog/purple-vegetables/>) veggie is **the world's cheapest source of antioxidants per ounce** — so stock up!
- **Curly Kale** — This increasingly popular cruciferous vegetable is **one of the world's most nutrient-dense foods**, and it contains a whopping serving of antioxidants including beta-carotene and vitamin C, plus vitamins K and B6, as well as manganese, calcium, copper, potassium, and magnesium. Cook it into a soup, blend it into a smoothie, or try this smashed kale salad (<https://foodrevolution.org/blog/plant-based-recipes/smashed-kale-salad/>) by Maria Marlowe.
- **Artichokes** — According to the aforementioned *Nutrition Journal* study, **artichokes are among the top antioxidant-rich veggies**. But don't just eat the hearts — the leaves contain a lot of the good stuff! If you've never cooked whole artichokes, it's easier than it appears. Here's a quick how-to (<https://www.kitchentreaty.com/how-to-steam-an-artichoke/>) on the process.
- **Oregano** — A great addition to plant-based pizza or almost any savory dish, oregano is big on taste and nutrient density. Research has found (<https://www.ncbi.nlm.nih.gov/pubmed/8933203>) it to be a **strong antioxidant and anti-carcinogenic**. You can also easily grow it at home (<https://foodrevolution.org/blog/food-and-health/how-to-grow-herbs-in-your-home-and-why-you-should/>), along with other antioxidant-rich herbs, such as rosemary, thyme, and sage. Chris Wark uses it in the dressing with his cancer-fighting salad recipe (<https://foodrevolution.org/blog/fight-cancer-salad-recipe/>).
- **Peppermint** — Everyone's favorite minty herb is a **powerful antioxidant**. It's packed with manganese, copper, vitamins A, B, C, E, and K, beta-carotene, folate,

packed with manganese; copper; vitamins A, B-6, C, E, and K; beta-carotene; iodate; riboflavin; and more. Fresh peppermint is great steeped into a fragrant tea! Just crush the leaves and add hot water.

- **Allspice** — This versatile spice contains vitamin A, vitamin C, eugenol, quercetin, and tannins, all combined to make it a strong addition to your diet. You can use allspice in sweet dishes. And for extra flavor, try adding it to stews, curries, and soups.
- **Cinnamon** — Cinnamon has countless applications in cooking, and it's full of polyphenols. In a 2005 study published (<https://www.ncbi.nlm.nih.gov/pubmed/16190627>) in the *Journal of Agricultural and Food Chemistry*, **cinnamon topped a list of 26 spices for its high antioxidant properties**. Try this apple cinnamon chia seed pudding (<https://foodrevolution.org/blog/plant-based-recipe-chia-seed-pudding/>) from Garden Fresh Foodie.
- **Cilantro** — This love-it-or-hate-it herb is big on the flavonoid quercetin, as well as iron, magnesium, and manganese. If you like cilantro, you may find it to be a delicious addition to salads, summer rolls, or guacamole.
- **Blueberries** — These tasty berries are among the most powerful antioxidants out there. A 2012 study published (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3274736/>) in the *Journal of Zhejiang University SCIENCE* found that **blueberries packed the strongest antioxidant punch when compared with blackberries and strawberries**. They've also been shown (<https://foodrevolution.org/blog/are-blueberries-good-for-you/>) to fight cancer, help with weight loss, aid in digestion, and protect your brain and heart. *If you can, choose wild blueberries (often found in the frozen section) sometimes because they have nearly double the antioxidant content.*
- **Dried Apples, Apricots, and Plums** — Ounce-for-ounce, **dried fruit actually contains more antioxidants than fresh fruit!** Be sure to avoid any with added sugar though, as *dried fruit has a high sugar content already*.
- **Dark Chocolate** — When it comes to chocolate, the higher the percentage of cocoa, the better. Dark chocolate has a wealth of antioxidant compounds including polyphenols, flavanols, and catechins. A 2011 study published (<https://ccj.biomedcentral.com/articles/10.1186/1752-153X-5-5>) in the study *Chemistry Central Journal* found that *dark chocolate had more antioxidant capacity than any of the superfruits, including blueberries and acai berries*. Lily's makes (<https://amzn.to/2ya25k9>) vegan, fair trade, sugar-free dark chocolates that are remarkably delicious.

• **Peppermint** — A 2011 study published

- **Pecans** — A 2011 study published (<https://academic.oup.com/jn/article/141/1/56/4630660>) in *The Journal of Nutrition* concluded that this tree nut's unique mix of antioxidants (including one form of vitamin E called gamma-tocopherols) might **help prevent heart disease**. After participants ate pecans, the unhealthy oxidation of LDL (bad) cholesterol in their blood decreased by as much as 33%. Eat a handful as an afternoon pick-me-up, or try this eggplant “parmesan” made with pecans (<https://foodrevolution.org/blog/plant-based-recipes/eggplant-parmesan-made-with-pecans/>), from Plantz St.
- **Goji Berries** — A staple of traditional Chinese medicine for centuries, these little red berries have only recently become more mainstream. **They are loaded with antioxidants**, and according to a 2008 study published (<https://www.ncbi.nlm.nih.gov/pubmed/18447631>) in the *Journal of Alternative and Complementary Medicine*, benefits of goji berries include “increased ratings for energy levels, athletic performance, quality of sleep, ease of awakening, ability to focus on activities, mental acuity, calmness, feelings of health, contentment and happiness, and significantly reduced fatigue and stress.” *Goji berries can be pricey, and I find it arguable whether they're really better for you than less exotic options, like strawberries or blueberries. But there's little doubt they're rich in antioxidants.*
- **Coffee** — This popular beverage turns out (<http://phys.org/news/2005-08-coffee-source-antioxidants.html>) to **have loads of antioxidants**. In fact, coffee (<https://foodrevolution.org/blog/food-and-health/coffee-health/>) is *the #1 source of antioxidants in the American diet* — by a wide margin.

## Here's What You Can Take Away from This Article

Now that we've taken a look at antioxidants, it's time to eat the rainbow and spice up your daily diet with as many antioxidant foods as you can. They'll help protect you from heart disease, cancer, diabetes, vision loss, and many other health challenges.

**When it comes to antioxidants, the whole really is greater than the sum of its parts.** Feast on a variety of whole plant foods, and your body will thank you for the rest of your life.

Tell us in the comments:

- Does this article help you answer the question: What are antioxidants?
- Is there anything else you want to know about antioxidants?

- What are your favorite antioxidant-rich foods?



**Fact: on average, plant foods contain 64 times more antioxidants than animal-based foods.**



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