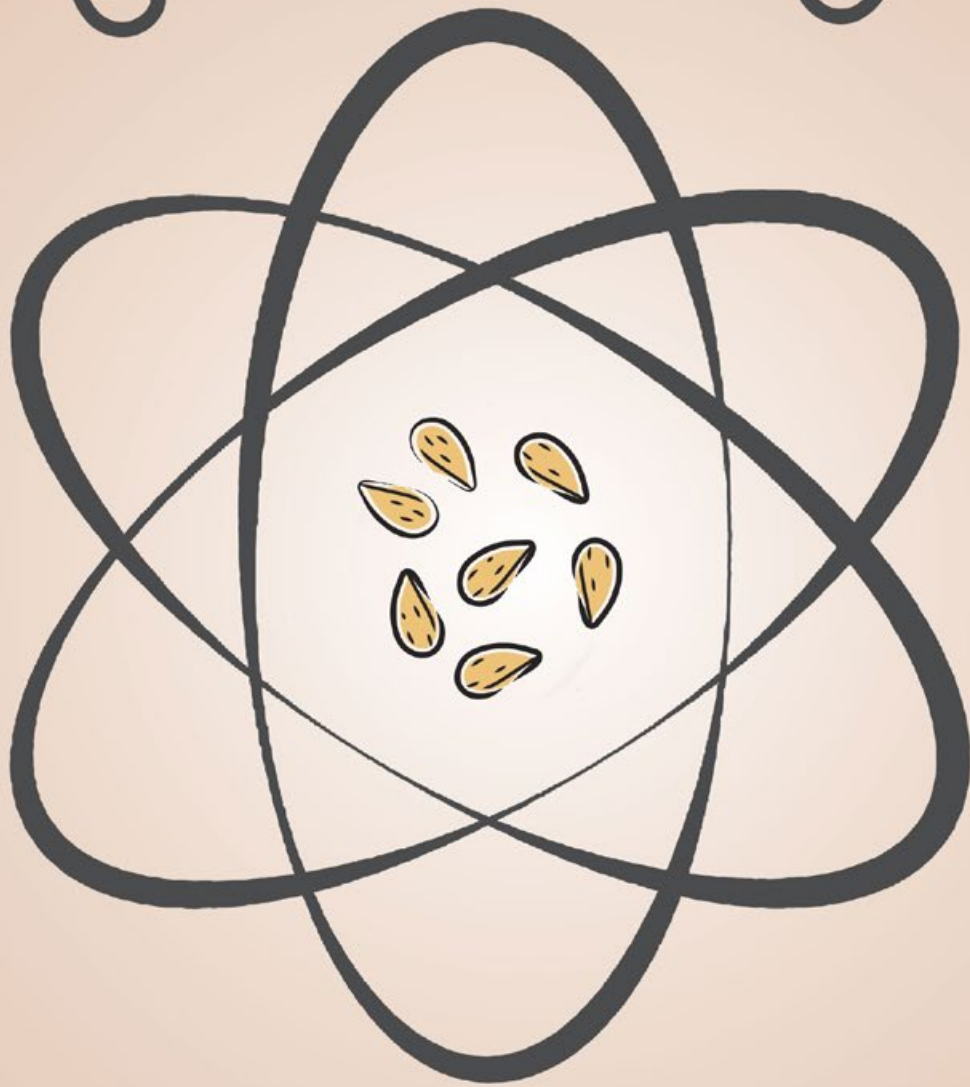


Nutrivore

GUIDE TO



Nuts & Seeds

BY THE TEAM AT NUTRIVORE

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Introduction to Nuts and Seeds

Delicious, energy-dense, and easy to harvest, nuts and seeds helped fuel our species from time immemorial! There's anthropological evidence that 2-million-year-old human relatives (the australopiths) ingested large amounts of nuts and seeds, even developing jaw and dental adaptations to help crack these foods open. Archaeological excavations have also unearthed primitive nut-cracking tools dating back 780,000 years, alongside the remains of ancient almonds, acorns, and pistachios!



Over time, nuts and seeds became important and often revered foods across the globe. Ancient Romans gave sugared almonds as a wedding gift (a tradition that's still alive today!), and by the Middle Ages, almond milk (made from ground almonds and water) was a common ingredient in recipes. Meanwhile, ancient Greeks and Romans used walnuts medicinally, and enjoyed walnut milk as a sweet refreshment.

Today, nuts and seeds remain enormously popular all over the world. Each year, 4.5 million metric tons of tree nuts are produced globally (with coconuts and peanuts topping the list by a landslide)! And, their widespread consumption is good news indeed. Nuts and seeds' outstanding fiber and micronutrient profiles, diverse phytonutrients, amino acids, and fats translate to a range of amazing benefits for human health.

Here's a closer look at why we should be going nuts for this fantastic food group!

What Are Nuts and Seeds?

As with many foods, what defines “nuts and seeds” depends entirely on whether we’re using a botanical definition or a culinary one. Technically, a nut is a specific type of fruit that has a hard shell surrounding an inner kernel, while a seed is a plant embryo enclosed in a protective covering (called the seed coat).

However, these botanical definitions exclude a number of foods we think of as nuts (such as cashews and almonds). So, for the purpose of defining a food group, “nuts and seeds” are considered to be any dry edible fruit that typically has a high fat content. (Although peanuts are technically a legume, we’re including them in the “nuts and seeds” food group too, due to their higher fat content and nutritional similarities with other members of this group!)

Commonly consumed nuts and seeds include:

- ALMONDS
- BRAZIL NUTS
- CASHEWS
- CHIA SEEDS
- COCONUTS
- FLAXSEEDS
- HAZELNUTS (FILBERTS)
- HEMP SEEDS
- MACADAMIA NUTS
- PEANUTS
- PECANS
- PILI NUTS
- PINE NUTS
- PISTACHIOS
- POPPY SEEDS
- PUMPKIN SEEDS
- SESAME SEEDS
- SUNFLOWER SEEDS
- WALNUTS

What Makes Nuts and Seeds So Great?

Phytonutrients, fats, amino acids, micronutrients, fiber, oh my... what's not to love? Here's a rundown of the many outstanding components nuts and seeds contribute to our diet!

Phenomenal Phytonutrients

Phytonutrients are an amazing gift from the plant kingdom: nutritive compounds in plants that, while not technically considered essential, are absolutely vital for optimal health and disease prevention. It just so happens that nuts and seeds are great sources of these health-promoting goodies; in fact, the phytonutrient content of these foods are responsible for many of their health benefits.



Some of the most common phytonutrients in nuts and seeds include:

- **PHYTOSTEROLS:** Nuts are rich in phytosterols—fat-soluble compounds with structural similarity to cholesterol, giving them the ability block absorption of cholesterol in the gastrointestinal tract (in turn helping lower LDL cholesterol and reduce cardiovascular risk). Phytosterols also have antioxidant and anti-inflammatory properties, improve blood sugar regulation and insulin sensitivity, and improve the composition of the gut microbiome! The phytosterols in nuts range from 404 mg per 100 g of sesame seeds to 42 mg in 100 g of coconut meat—comparable to the levels found in legumes (another famously phytosterol-rich food group) which offers a peak of 205 mg per 100 g of black beans. Seeds like pumpkin seeds, sesame seeds, and sunflower seeds are particularly impressive sources.
- **STILBENES:** Some nuts are good sources of phenolic compounds called stilbenes—particularly resveratrol, an antioxidant compound famously found in red wine! Resveratrol has powerful anti-inflammatory, immunomodulatory, cardio-protective, neuro-protective, lipid-lowering, and glucose-modulating activity and has consistently shown up as disease-protective in studies. Peanuts and pistachios are the richest nut sources of this particular stilbene. (In fact, studies have shown that some peanut and pistachio samples have higher concentrations of resveratrol than some red wine samples!)
- **CAROTENOIDS:** Some nuts and seeds are particularly good sources of the carotenoids alpha- and beta-carotene, beta-cryptoxanthin, lutein, and zeaxanthin—a diverse group of phyto-

nutrients shown to support vision health, protect against metabolic syndrome and diabetes, and reduce inflammation. Pistachios, flaxseed and hazelnuts are particularly high in carotenoids!

- **PROANTHOCYANIDINS:** Proanthocyanidins are phenolic compounds with anti-cancer, antioxidant, anti-diabetic, anti-inflammatory, anti-arthritis, neuroprotective, and antimicrobial properties! They also appear to protect against some eye diseases. Hazelnuts and pecans have the highest proanthocyanidin content among the nuts, but almonds, peanuts, and pistachios are also good sources.
- **FLAVONOIDS:** Flavonoids are a diverse group of polyphenols that may help reduce inflammation, exert antibacterial properties, and protect against heart disease and certain cancers. Although flavonoids have a range of different health effects, their benefits seem to be primarily due to helping regulate cell-signaling pathways (rather than by acting as antioxidants, which is a perk many phytonutrients offer). Pecans, almonds, pistachios, and hazelnuts rank the highest in terms of their flavonoid content!

Fantastic Fats

Although nuts were once feared for their fat content, research consistently shows that the lipids in these foods are actually a major driver of their health benefits! Specifically, the major fats in nuts include:

- **LINOLEIC ACID:** Linoleic acid is the only essential omega-6 fatty acid! Along with being required for human growth and development, it serves as a structural component of cell membranes, plays a role in maintaining skin health and integrity, and is a precursor for bioactive lipid mediators. Walnuts, pine nuts, hemp seed, sunflower seeds, and Brazil nuts are among the richest nut and seed sources of linoleic acid.
- **MONOUNSATURATED FAT:** Monounsaturated fatty acids (MUFA) play an important role in cellular function. The main MUFA in nuts and seeds is oleic acid, which has demonstrated benefits for cardiovascular health—both in reducing risk factors like high blood pressure, cholesterol, triglycerides, inflammation, and oxidative stress, and in reducing actual cardiovascular disease incidence and events. Oleic acid has also demonstrated anti-cancer activity, may assist in body weight regulation, and influence genes and pathways involved in insulin signaling and glucose metabolism. Macadamia, hazelnuts and pecans top the list here for MUFA content!
- **ALPHA-LINOLENIC ACID:** Alpha-linolenic acid (ALA) is the only truly essential omega-3 fatty acid. Like other omega-3 fats, it plays an important role in regulating inflammation, pain perception, and blood pressure. It's also a major structural component of the phospholipid layer of cell membranes. Getting enough ALA helps maintain cardiovascular health, while also potentially protecting against cancer, pneumonia, and some forms of depression. Walnuts, flaxseeds, hempseeds, and chia seeds are exceptional sources of this fat; pecans and sesame seeds also contain notable amounts!

Vitamin E, We Love Thee!

Although nuts and seeds are rich in a wide variety of micronutrients (as we'll see shortly), one vitamin in particular deserves a shout-out: vitamin E! In fact, nuts and seeds are the best whole-food sources of this important nutrient.

Vitamin E's most significant role is as a fat-soluble antioxidant, protecting the lipids in cell membranes from oxidative damage. Its free radical-scavenging abilities make vitamin E helpful for cardiovascular health, cancer protection, neurological health (including slowing the progression of Alzheimer's disease), eye health, and any situations where oxidative stress increases (such as during pregnancy). What's more, vitamin E is vital for fertility, during pregnancy, and for maintaining skin health. There's even evidence that getting enough vitamin E can reduce the risk of the common cold!

Not only that, but vitamin E absorption is greatly enhanced by the presence of fat—making nuts and seeds, with their naturally abundant fat content, extremely bioavailable sources of this nutrient. [One human trial](#) found that consuming a diet with 10% or 20% of calories from almonds increased blood levels of vitamin E by 12% and 15%, respectively! [Another human trial](#) from 2018 similarly found that eating 56 g of almonds per day, for a period of four weeks, increased plasma vitamin E by 8.5%.

Per 100 g serving, nuts contain the following amounts of vitamin E:

- **ALMONDS:** 27 mg
- **BRAZIL NUTS:** 16 mg
- **CASHEWS:** 7 mg
- **CHIA SEEDS:** 0.5 mg
- **COCONUTS:** 2 mg
- **FLAXSEEDS:** 21 mg
- **HAZELNUTS (FILBERTS):** 20 mg
- **HEMP SEEDS:** 1 mg
- **MACADAMIA NUTS:** 0.5 mg
- **PEANUTS:** 8 mg
- **PECANS:** 27 mg
- **PINE NUTS:** 21 mg
- **PISTACHIOS:** 26 mg
- **PUMPKIN SEEDS:** 38 mg
- **SESAME SEEDS:** 0.3 mg
- **SUNFLOWER SEEDS:** 37 mg
- **WALNUTS:** 24 mg

Magnificent Micronutrients

Of course, vitamin E is far from the only micronutrient nuts and seeds provide. Other notable vitamins and minerals include:

- **COPPER**, a trace mineral involved in glucose and cholesterol metabolism, gene expression, free radical scavenging, red blood cell production, and the growth, development, and maintenance of various organs (including the heart and brain). Per oz, sesame seeds contain 127% of the DV, while cashews contain 68%! Brazil nuts, sunflower seeds, pumpkin seeds, and pistachio seeds are also great sources, containing between 40 and 56% of the DV.
- **MAGNESIUM**, an essential mineral that acts as an electrolyte and structural component in cells and bone tissue, and that serves as a cofactor for hundreds of different enzymes (giving it a role over 300 metabolic reactions!). Pumpkin seeds, Brazil nuts, sesame seeds, sunflower seeds, almonds, and cashews are all notable sources of magnesium.
- **MANGANESE**, a mineral that serves as a cofactor and component of numerous enzymes—giving it roles in carbohydrate metabolism, amino acid synthesis, gluconeogenesis, detoxification, lipid processing, free radical defense, bone and collagen formation, and wound healing. Pumpkin seeds contain 55% of the DV per oz, but sesame seeds, almonds, sunflower seeds, cashews, coconuts, and pistachios also supply substantial amounts.
- **VITAMIN B7** (biotin), a water-soluble B vitamin that plays an important role in energy metabolism (serving as a coenzyme for five carboxylase enzymes), neurotransmitter production, cellular function, and the function of various organs. Per oz, almonds contain 45% of the DV for biotin, and pistachios contain 30%.
- **ZINC**, an essential trace mineral that serves as a cofactor for over 300 enzymes and 1000 transcription factors, giving it important roles in immune function, sensory organ function, reproduction, gene regulation, DNA synthesis, wound healing, and the metabolism and activity of multiple other nutrients. Pumpkin seeds and sesame seeds contain 20% of the DV per oz, while cashews contain 15% and sunflower seeds contain 13%.

Lastly, Brazil nuts deserve a special mention for their incredible content of selenium—a relatively hard-to-get antioxidant mineral that's important for immune and brain function. A one oz serving of Brazil nuts provides 976% of the recommended daily intake!

Fabulous Fiber

Nuts and seeds are excellent sources of fiber! Although not officially labeled as essential, fiber is absolutely fundamental for our health—helping regulate gut motility (promoting regularity), modulating gastric hormones, and supplying our gut bacteria with fermentable substrate (i.e., food!) so that important microbes can flourish and remain diverse.

High fiber intake also reduces the risk of cardiovascular disease and of many forms of cancer (especially colorectal cancer, but also liver cancer, pancreatic cancer, and others), and promotes overall lower inflammation. High-fiber diets reduce the risk of mortality in cases of kidney disease and diabetes, and can even reduce your risk of dying from an infection!

Different nuts and seeds have their own unique fiber compositions, but research generally shows that any nut fiber is likely to have a beneficial effect on gut health, appetite regulation, fat absorption, cholesterol levels, and more! For example, [a 2023 in vitro experiment](#) found that nut fibers stimulated the growth of Lachnospiraceae and Ruminococcaceae bacteria, promoting the proliferation of beneficial microbes in the colon (including some that generate short-chain fatty acids). [A 2022 randomized crossover trial](#) found that consuming 28 g per day of peanuts, for a period of six weeks, significantly increased levels of Ruminococcaceae and Roseburia intestinalis, an important butyrate producer. In [a 2020 experiment](#) using a simulated gastrointestinal model, soluble fiber from chia seeds reduced the accessibility of fats, glucose, and cholesterol, limiting their digestion.

Fiber from flaxseeds, in particular, has been the subject of a number of studies. For example, [a 2012 randomized crossover study](#) found that flaxseed fiber (added to either a drink or to bread) increased the excretion of fat, while also decreasing total and LDL cholesterol levels. Another [randomized controlled trial](#) from 2012 found that the addition of 2.5 g of flaxseed fiber to a beverage significantly suppressed appetite and energy intake. And yet [another human trial](#) found that among young men, flaxseed fiber suppressed post-meal rises in triglyceride levels, while also reducing appetite! [A 2005 trial](#) similarly found that supplemental flaxseed fiber (added to bread) reduced the subsequent blood sugar response.

Per 100 g, nuts and seeds contain the following amounts of total fiber:

- **ALMONDS (WITH SKIN):** 13g
- **BRAZIL NUTS (DRIED, UNBLANCHED):** 8g
- **CASHEWS (RAW):** 3g
- **CHIA SEEDS:** 34g
- **COCONUTS (RAW):** 9g
- **FLAXSEEDS:** 27g
- **HAZELNUTS (FILBERTS):** 10g
- **HEMP SEEDS:** 4g
- **MACADAMIA NUTS:** 9g
- **PEANUTS:** 9g
- **PECANS:** 10g
- **PINE NUTS:** 4g
- **PISTACHIOS (RAW):** 11g

- PUMPKIN SEEDS (SHELLED AND DRIED): 6g
- SESAME SEEDS (WHOLE, DRIED): 12g
- SUNFLOWER SEEDS: 9g
- WALNUTS: 7g

A Spotlight on L-Arginine

Nuts and seeds are some of the best food sources of L-arginine—an amino acid that plays several important roles in human health. The most unique benefit of this amino acid is its ability to increase vasodilation (AKA opening, or dilating, blood vessels)!

More specifically, L-arginine is a precursor to nitric oxide (NO), a molecule that plays a crucial role in blood vessel dilation—in turn helping regulate blood flow, maintaining healthy blood pressure, allowing proper circulation throughout the body, and enhancing the overall health of the cardiovascular system. Studies show L-arginine is particularly beneficial for people with conditions like hypertension and atherosclerosis, but evidence also suggests it could benefit patients with preeclampsia, erectile dysfunction, and peripheral arterial disease! Yet one more reason nuts are truly a heart-healthy food.

Nuts and seeds particularly high in arginine are peanuts, sesame seeds, pumpkin seeds, hazelnuts, chia seeds, pistachios, Brazil nuts, pine nuts, cashews, walnuts, and almonds—all possessing at least 600 mg of arginine per oz.

Health Benefits of Nuts and Seeds

Not surprisingly, numerous in vitro, in vivo, clinical, and epidemiologic studies have associated nut intake with a wide range of health benefits—including the modulation of glucose levels and serum lipids, positive influences on body weight, antioxidant and anti-inflammatory activities, and, consequently, protective effects against certain chronic conditions, such as cancer and cardiovascular diseases. Eating nuts and seeds on a regular basis not only improves health but can potentially extend lifespan too!

Here's what the science says about nut and seed consumption and health risk!



Reduced risk of cardiovascular disease:

Nuts and seeds are a dazzlingly heart-healthy food group. Epidemiological studies consistently show an association between nut intake and reduced risk of heart disease and stroke, as well as a reduced risk of death from these diseases.

For example, [a 2023 systematic review and meta-analysis](#) found that high versus low consumption of total nuts and seeds was associated with a lower risk of:

- TOTAL CARDIOVASCULAR DISEASE (19% LOWER RISK)
- CARDIOVASCULAR DISEASE MORTALITY (23% LOWER RISK)
- CORONARY HEART DISEASE (18% LOWER RISK)
- CORONARY HEART DISEASE MORTALITY (25% LOWER RISK)
- NON-FATAL CORONARY HEART DISEASE (15% LOWER RISK)

What's more, a dose-response analysis of the data found that with every 30 g per day increase in nut consumption, cardiovascular disease risk dropped by 24% and cardiovascular disease death dropped by 27%!

And, [a 2019 meta-analysis of prospective cohort studies](#) found that along with reducing cardiovascular and coronary heart disease incidence and mortality, higher nut consumption was associated with a 15% lower risk of atrial fibrillation and a 17% lower risk of death from stroke!

The cardiovascular-protective mechanisms of nuts and seeds are almost too numerous to count: the fiber, magnesium, polyunsaturated fatty acids, vitamin E, phytonutrients, and L-arginine in nuts have all been independently linked to reductions in cardiovascular risk—including improving endothelial function, positively impacting glucose and lipid homeostasis, improving blood lipid profiles, reducing inflammation, and more. Few foods have such an impressive resume when it comes to heart health!



Reduced risk of cancer:

Research shows that nuts and seeds may reduce cancer risk, have anti-cancer effects against specific cancer types, and even help protect against death from cancer. For example, [a 2020 meta-analysis](#) encompassing 47 studies found that compared with eating no nuts, consuming tree nuts was associated with a 12% lower cancer risk. There was also a 10% lower risk of cancer-specific mortality! These protective effects increased with greater nut intake.

A 2021 systematic review and meta-analysis of observational studies likewise found that the highest (versus lowest) intakes of total nuts was associated with a 14% lower risk of cancer. And, every 5 g daily increase in total consumption was associated with a 3% reduced risk of cancer 4% lower risk of cancer mortality!

And, [another 2020 meta-analysis](#) found that compared with the lowest category of nut intake, higher nut consumption was associated with a 10% decreased risk of overall cancer. These protective effects started with a consumption of 9 g of nuts per day, and the risk of cancer decreased by 10% for every 20 g per day increase in nut consumption.

Most recently, [a 2023 meta-analysis](#) found that every 10 g daily increase in tree nut intake was associated with a 20% reduction in overall cancer mortality!

Along with protecting against cancer on the whole, some research has linked nut and seed consumption to reduced risk of specific cancers. Those include:

- **BREAST CANCER:** [A 2015 study](#) found that high intakes of walnuts, almonds, and peanuts reduced breast cancer risk by 2 to 3 times! And, [a 2022 study](#) found that regular nut consumption was associated with better disease-free survival among long-term breast cancer survivors.
- **COLORECTAL CANCER:** [A 2018 case-control study](#) found that consuming at least three servings of nuts per week (compared to consuming no nuts) was associated with a 70 – 72% lower risk of colorectal cancer. Another [prospective observational study](#) from 2018, studying patients with stage III colon cancer, found that those who consumed at least two servings of tree nuts per week had a 46% increase in disease-free survival (and 53% increase in overall survival) compared to patients who didn't consume nuts!
- **PANCREATIC CANCER:** [A 2013 prospective study](#) of over 75,000 women found that after adjusting for various risk factors, consuming nuts at least twice per week (compared to rarely or never) was associated with a 35% lower risk of pancreatic cancer.
- **LUNG CANCER:** [A 2017 analysis](#) of two large observational studies found that regardless of smoking status, the highest versus lowest quintile of nut intake was associated with a 26% lower risk of lung cancer.



Improved blood sugar control:

Although the jury's still out about whether nut and seed consumption directly impacts incidence of type 2 diabetes, studies suggest these foods can at least help regulate blood sugar! For instance, [a 2021 systematic review](#) of 15 different trials concluded that among type 2 diabetics, tree nut consumption helped reduce both fasting blood sugar and glycated hemoglobin (a measure of long-term blood sugar control). The beneficial role of nuts in glucose and insulin metabolism has been associated with their content of fiber, fat, minerals, and other bioactive molecules.



Improved cognitive health and performance:

Nuts and seeds could rightfully be called "brain food!" [A 2023 prospective cohort study](#) found that among adults aged 55 to 75, those consuming at least three servings of nuts per week had a significantly slower decline in cognitive performance, compared to participants eating less than one serving of nuts per week. Another [prospective study from 2019](#) found that even after adjusting for potential demographic, dietary, and behavioral factors, eating at least 10 g of nuts per day was associated with higher cognition scores and a 40% lower risk of poor cognitive function!

Similarly, [a 2022 cohort study](#) of elderly adults found that compared to nut non-consumers or less-than-weekly consumers, those consuming at least 70 g per week of nuts had a 17% lower risks of cognitive impairment. Importantly, consistent nut consumption mattered: eating large amounts of nuts on an infrequent basis (e.g., at least 70 g consumed in only one day per week) was not associated with better cognitive performance!

Peanuts specifically have been shown to boost some aspects of cognition, especially memory. In [a 2021 randomized controlled trial](#) of healthy young adults, six months of consuming either 25 g daily of roasted peanuts or 32 g daily of peanut butter resulted in significant improvements in immediate memory, as well as better stress responses. These improvements were heavily correlated with polyphenol intake from the peanuts!

These cognition-supportive effects seen observationally are well supported mechanistically. Neurons are particularly susceptible to oxidative stress, and the impressive quantities of vitamin E, antioxidant phytonutrients, and (in some cases) omega-3 fats in nuts and seeds can help protect neurons from free radical damage!

Reduced risk of death from infectious disease:



[A 2016 systematic review and meta-analysis of prospective studies](#) found that every 1 oz serving per day increase in tree nut intake was associated with a 75% lower risk of death from infectious disease. [A 2019 analysis of data](#) from over 566,000 adults likewise found that after adjusting for potential confounders, nut consumption (compared to no nut consumption) was associated with a 23 – 28% lower risk of death from infectious causes.

Indeed, nuts contain a number of potentially immune-boosting components that could explain this finding—particularly their phytonutrients and vitamin E!



Reduced risk of depression:

Nuts and seeds may even help protect against depression! For example, a 2016 cohort study of over 13,000 adults found that consuming nuts at least once per week (compared to less than once per week) was associated with an 18% reduced risk of depressive symptoms. [A 2022 systematic review](#) likewise concluded that overall, the available research (both observational studies and controlled trials) suggests that higher nut consumption is associated with lower risk of depression, better mood state, and fewer depressive symptoms in the overall population.



Reduced risk of non-alcoholic fatty liver disease (NAFLD):

[A 2023 systematic review and meta-analysis](#) of 12 observational studies found that when comparing the highest nut intake with the lowest, NAFLD risk was reduced by 10%. [One prospective study from 2020](#) found that among men, consuming nuts at least once per day was associated with a 41% lower risk of developing NAFLD. And, [a 2021 analysis of National Health and Nutrition Examination Survey \(NHANES\) data](#) found that nut consumption of 15 – 30 g daily was associated with significantly lower prevalence of NAFLD in both men and women.

This protective effect may be due to nuts' high vitamin E content (which helps prevent lipid peroxidation involved in NAFLD), fiber (which helps reduce liver exposure to harmful bacterial products like endotoxin), and unsaturated fat (which has been shown to help alleviate liver fibrosis and liver fat accumulation).



Reduced risk of respiratory disease death:

[A 2016 systematic review and meta-analysis of prospective studies](#) found that every 1 oz serving per day increase in nut consumption was associated with a 52% reduced risk of respiratory disease mortality! [A 2015 meta-analysis](#) of over 120,000 adults likewise found a 29% lower risk of death from respiratory diseases when comparing the highest versus lowest intakes of nuts. And, [a 2014 analysis](#) of two large cohort studies found that consuming nuts two to four times per week was associated with a 17% reduction in respiratory disease mortality, while consuming nuts at least five times per week cut that risk by 24%!

Although more research is needed to understand the mechanisms at play here, the fatty acids, magnesium, and phytonutrients in nuts and seeds have been shown to have lung-protective effects.



Neutral or reduced risk of weight gain and obesity:

Although nuts were once feared to contribute to weight gain due to their high fat content and energy density, our most up-to-date research suggests they contribute to weight gain in the general population—and what's more, may even help protect against obesity!

For example, [a 2021 systematic review and meta-analysis](#) found that in prospective cohort studies, higher nut consumption was associated with a 7% lower risk of being overweight or obese, as well as a lower risk of elevated waist circumference. Similarly, [a 2019 systematic review](#) of prospective studies found an inverse association between long-term nut consumption (typically at intakes of at least one to two servings per week) and weight gain over time. Consumed in moderation, the nutrients, fiber, and bioactive compounds in nuts appear to promote metabolic health and assist in healthy weight regulation.



Reduced risk of all-cause mortality:

Nut consumption appears protective over all-cause mortality! [The 2020 Prospective Urban Rural Epidemiology \(PURE\) study](#), using data from 16 countries from five different continents, found that consuming over 120 g of nuts per week (compared to less than 30 g per month) was associated with a 23% reduced risk of total mortality (including a 28% reduced risk of cardiovascular mortality, and an 18% reduced risk of non-cardiovascular mortality)!

Similarly, [a 2016 systematic review and meta-analysis](#), encompassing 29 prospective studies, found that a mere 10 g serving per day increase in tree nut intake was associated with an 18% reduced risk of all-cause mortality!

What's the Deal with Peanuts?

Arguably the most beloved of the nuts (at least based on global consumption!), peanuts have been subject to some lingering rumors about their healthfulness and safety. In particular, you may have heard the claim that peanuts are widely contaminated with mycotoxin-producing mold, making them dangerous to eat. Yikes! When it comes to peanuts, is there a fungus among-us?



Peanuts can indeed be susceptible to mold growth—primarily *Aspergillus flavus*, which produces carcinogenic metabolites called aflatoxins (which in turn have been shown to induce liver injury and liver cancer at high enough exposures). This mold is more likely to contaminate crops in warm and humid regions, and can infect peanuts growing in the field, at harvest, or during storage.

However, this doesn't mean the peanuts we buy in the store are swimming in mycotoxins! In many parts of the world (especially in the United States and the European Union), strict regulations and quality control measures are in place for peanuts and peanut products. These regulations involve testing and setting limits on aflatoxin levels, ensuring that peanuts on the market are safe to consume. The FDA also conducts random checks on peanut butter and other peanut products, removing any items from sale that don't meet food safety standards.

What's more, most peanuts sold for human consumption go through processes like roasting or heat treatment. These processes destroy a substantial amount of aflatoxin. For example, [a 2017 study](#) found that roasting reduced the aflatoxin content of experimentally contaminated peanuts by up to nearly 90%!

It's also worth noting that, to date, there haven't been any reported outbreaks of human illness caused by aflatoxins in the United States (although such outbreaks have occurred in some developing countries).

Bottom line: by the time peanuts (and peanut products) reach the store shelves, they've been harvested, processed, and screened to eliminate any harmful levels of aflatoxin exposure. Buying major brands of peanut products and peanut butter (opposed to home-grown items) can help further ensure these products are safe!

Nuts and Seeds Nutrivore

Nuts and seeds have an average Nutrivore Score of 276, but different members of this food group vary tremendously here!

Almonds (with skin)	234
Brazil nuts (dried, unblanched)	694
Cashews (raw)	203
Chia seeds	450
Coconut (raw)	179
Flaxseeds	515
Hazelnuts (filberts)	292
Hemp seeds	415
Macadamia nuts	167
Peanuts	219
Pecans	221
Pine nuts	222
Pistachios	265
Pumpkin seeds	271
Sesame seeds	299
Sunflower seeds	340
Walnuts	303

Some Practical Pointers

Here are some tips for selecting and storing nuts and seeds, to ensure they stay fresh and delicious as long as possible!

- **CHECK FOR FRESHNESS.** When buying nuts and seeds (especially if in bulk containers rather than pre-packaged), look for those with no signs of rancidity or mold. Avoid nuts that look or smell “off”!
- **BUY IN SMALL QUANTITIES.** The unsaturated oils in nuts and seeds can go rancid over time due to more readily oxidizing than saturated fats. Purchase smaller quantities to ensure you use them before they spoil!
- **STORE IN AIRTIGHT CONTAINERS.** Storing nuts and seeds in airtight containers (like glass jars or resealable bags) helps prevent exposure to air and moisture, in turn helping them stay fresh for longer.
- **KEEP THEM COOL AND DRY.** Store nuts and seeds in a cool, dry place, such as a cupboard or pantry (as long as those places aren’t near the stove!). Avoid storing in direct sunlight. Moisture can cause nuts and seeds to spoil more quickly (or in the case of raw items, sprout!), so keeping them away from humid environments is ideal.
- **REFRIGERATE OR FREEZE.** For nuts with higher polyunsaturated fat content (such as walnuts or flaxseeds), storing in the refrigerator or freezer can help prevent their delicate fats from oxidizing, in turn extending shelf life. Just be sure to use an airtight container or freezer bag!
- **LABEL AND DATE.** To help keep track of freshness, label containers with the date of purchase.



Recipes



BREAKFAST

Toasted Coconut Macadamia Oat Muffins

PREP TIME

15 minutes

COOK TIME

20 minutes

YIELD

12 muffins

½ cup macadamia nuts
½ cup shredded coconut
1 cup flour, or gluten free blend or grain free flour of choice
1 cup rolled oats
½ cup maple sugar or granulated sugar of choice

½ teaspoon sea salt
¼ teaspoon baking soda
1 teaspoon cream of tartar
¾ cups water
⅓ cup olive oil or oil of choice
3 large eggs

1. Preheat oven to 350°F. Grease the wells of a muffin pan, or use silicone muffin pan liners.
2. Toast macadamia nuts and coconut flakes on a baking sheet in the oven until starting to brown, about 6-8 minutes, stirring every 2-3 minutes.
3. In a large bowl, combine flour, oats, sugar, salt, baking soda, and cream of tartar.
4. In a medium bowl, whisk together water, oil, eggs and vanilla. Pour into dry ingredients and stir to incorporate. Fold in toasted macadamia nuts and shredded coconut.
5. Spoon batter into prepared muffin pan. Fill almost to the brim.
6. Bake for 25 minutes, until a toothpick pricked in the middle of a muffin comes out clean. Remove from pan immediately after the muffins come out of the oven. (The easiest way to do this is to invert the pan over a cutting board). Serve warm or let cool to room temperature.

FLAVOR VARIATIONS: Add 1 sliced banana to make Coconut Macadamia Banana Muffins. Add 1 cup white chocolate chips to make White Chocolate Coconut Macadamia Muffins.



SIDES AND

SALADS

Asparagus and Peas with Pine Nuts

PREP TIME

5 minutes

COOK TIME

20 minutes

YIELD

4 servings

1 bunch asparagus

2 shallots

¼ cup pine nuts

2 tablespoons olive oil or oil of choice

2 cups fresh shelled peas or frozen
peas, thawed

¼ cup water

¼ teaspoon salt

1 tablespoon lemon juice

1. Snap tough ends off asparagus and cut into 1 ½-inch pieces. Cut shallots in half and finely slice crosswise, to make half-moon slices.
2. Heat a skillet over medium heat. Add pine nuts to dry skillet and toast, stirring constantly, until fragrant. About 2 to 3 minutes. Remove and set aside.
3. Add oil and shallots to pan, and sauté, stirring frequently, until browned, about 5 to 7 minutes. Remove and set aside.
4. Add peas and asparagus to the pan with water and salt and increase heat to high. Cover and cook for 3 to 4 minutes, until asparagus is cooked al dente. Drain any excess water.
5. In a serving bowl, toss drained peas and asparagus with lemon juice. Top with toasted pine nuts and caramelized shallots. Serve!



Citrus Fig and Walnut Salad

PREP TIME

10 minutes

COOK TIME

none

YIELD

1-2 servings

2 cups arugula
2 cups baby kale
3 tablespoons thinly sliced red onion
1 large orange, segmented
4 kumquats (if you can't find them, double the orange),
thinly sliced (discard seeds but leave peel on)
3 dried figs, cut into ½-inch pieces
½ cup walnut halves or large pieces, or sub Candied
Pecans ([See page 35](#))
½ avocado, peeled, pitted, and divided into
½- to ¾-inch pieces
2 tablespoons olive oil or oil of choice
1 tablespoon balsamic vinegar
Pinch cracked pepper
Pinch of sea salt

1. Gently toss arugula, kale, red onion, orange segments, kumquats, dried fig and walnut together. Top with avocado chunks.
2. **MAKE DRESSING:** in a small bowl, mix oil, balsamic vinegar, pepper and salt. Drizzle the dressing over the top immediately before serving.



TIP: You can also use regular kale to make this salad; remove and discard the stems and tear the leaves in bite-sized pieces.



Roasted Veggies With Walnuts

PREP TIME

15 minutes

COOK TIME

15 minutes

YIELD

3 - 4 servings

½ red bell pepper, cut into 1-inch cubes

½ orange or yellow bell pepper, cut into 1-inch cubes

¼ red onion, cut into 1-inch cubes, separated

4 ounces portabella mushrooms, thickly sliced

1 tablespoon olive oil or oil of choice

¼ teaspoon salt

¾ cup sugar snap peas

1 small zucchini, sliced into ¼-inch thick rounds

1 yellow summer squash, sliced ¼-inch thick rounds

2 cloves garlic, minced

2 teaspoons balsamic vinegar

¼ cup fresh basil leaves

¾ cup walnut halves or large pieces

1. Preheat oven to 400°F.
2. Toss bell pepper, onion and mushrooms with olive oil and salt.
3. Place on a rimmed baking sheet, spreading out to not overcrowd, and bake for 10 minutes
4. Add snap peas, zucchini, yellow squash and garlic to baking sheet, stir to incorporate, and then top with walnuts. Cook for 5 to 6 minutes, until vegetables are tender-crisp and walnuts are toasted.
5. Drizzle with balsamic vinegar and sprinkle with basil. Serve.



APPETIZERS

Stuffed Figs With Pistachios

PREP TIME

15 minutes

COOK TIME

10 minutes

YIELD

2-3 servings

6 fresh figs
½ cup chèvre or dairy-free alternative
1 tablespoon honey
2 tablespoons pistachios, roughly
chopped

1. Preheat the oven to 400°F.
2. Slice off stem and score each fig with an X about a third of the way through. Place figs on a rimmed baking sheet lined with parchment paper and roast for 10 minutes, until figs are beginning to brown and have softened slightly.
3. Remove from the oven and transfer to a serving dish to cool for 10 minutes.
4. Spoon about a tablespoon of chèvre (or however much will fit) into each fig. Drizzle with honey and then sprinkle chopped pistachios over the top.



ENTRÉES

Dukkah-Crusted Lamb

PREP TIME

10 minutes

COOK TIME

30 minutes

YIELD

4-6 servings

1 tablespoon honey

1 tablespoon pomegranate molasses

½ cup raw unsalted pistachios

2½ tablespoons sesame seeds

1 tablespoon ground coriander

2 teaspoons ground cumin

¼ teaspoon sea salt

1 to 3 tablespoon(s) red palm oil or oil
of choice3 to 4 pounds bone-in lamb chops
(rib or loin)

1. Combine honey and pomegranate molasses. Set aside.
2. Heat a frying pan over medium heat and add the pistachios and sesame seeds to the pan. Toast the nuts and seeds, shaking or stirring occasionally, until fragrant and starting to brown. Remove the pan from the heat and let cool. Place the nuts and seeds in a food processor and grind until the consistency of coarse sand.
3. Combine ground, toasted pistachios and sesame seeds with coriander, cumin, and salt. Place on a plate and set aside.
4. Heat a large frying pan over medium-high heat. Add 1 to 2 tablespoons of oil to the pan. Fry the lamb chops in the oil in batches, 2 minutes per side for medium-rare (or 3 minutes per side for medium). You can adjust the cooking time for the thickness of the chops and your desired doneness.
5. As the chops are cooked, set aside and cover with aluminum foil or place in a warm oven (set to its lowest temperature) to keep warm.
6. Take each cooked lamb chop and dip into the ground pistachio mixture on each side to give it a nice coating. Drizzle with the pomegranate molasses mixture and serve.



Pecan-Crusted Chicken Breast with Cauliflower Gravy

PREP TIME

10 minutes

COOK TIME

25 minutes

YIELD

4 servings

4 chicken breasts (about 2lbs)

1 egg

1 cup pecans

½ teaspoon salt

¼ teaspoon pepper

1 ½ cups broth

½ head cauliflower

1 clove garlic

Salt, to taste

1. Preheat oven to 425°F. Line a baking sheet with parchment or silicone liner.
2. Pulse pecans in a food processor until the consistency of coarse sand. Combine with salt and pepper in a shallow bowl.
3. Gently whip egg white with a fork.
4. Dry chicken breasts with paper towel. Dredge in egg white and gently wipe off excess with your fingers. Dredge in pecans then place on prepared baking sheet.
5. Bake for 25 minutes, flipping at the 15-minute mark.
6. Meanwhile, cut cauliflower into florets. Place in a pot with garlic and broth.
7. Bring to a boil, then reduce heat to maintain a simmer. Simmer 15 minutes, until cauliflower is overcooked. Pour broth and cauliflower into a high powered blender. Blend for 1 minute, or until completely smooth. Taste and season with salt to taste.
8. Serve chicken with gravy.



Chicken Chop Suey With Almonds

PREP TIME

20 minutes

COOK TIME

10 minutes

YIELD

4-5 servings

3 tablespoons olive oil or oil of choice
1 ½ pounds chicken boneless skinless thigh, sliced into half inch cubes
2 cups diced carrots
2 cup sliced mushrooms
2 cup diced celery
2 cup diced onions
1 cup diced green pepper

3 cups mung bean sprouts
1½ cup whole blanched almonds
2 teaspoons sea salt, plus more to taste
1 tablespoon honey, or sugar of choice
2 tablespoons arrowroot or cornstarch
1 teaspoon sesame oil
1 cup chicken stock

1. Heat a wok or large skillet over high heat. Add oil to pan. Add chicken, carrots, mushrooms, celery, onions and green pepper. Cook, stirring constantly, for 6 to 8 minutes, until chicken is fully cooked. If a lot of liquid is accumulating in the wok, turn up the heat to reduce or spoon the excess liquid out of the wok and discard.
2. Add almonds and mung beans sprouts and cook, stirring constantly, for an additional 1 to 2 minutes until sprouts have wilted.
3. Mix salt, honey, starch, and sesame oil with chicken stock. Add to wok and stir until the sauce has thickened, about 1 to 2 minutes. Taste and add additional salt, if needed. Serve!



Cashew Chicken Stir-Fry

PREP TIME

10-15 minutes

COOK TIME

20 minutes

YIELD

4-6 servings

3 tablespoons oil of choice
3 cloves garlic, finely chopped
2 teaspoons finely chopped fresh galangal or ginger, or 1 teaspoon galangal powder
2 pounds boneless, skinless chicken thighs or breasts, chopped into ½-inch pieces
8 ounces mushrooms, about 2 cups, sliced
1 (5-ounce) can sliced bamboo shoots, drained and rinsed
1 (5-ounce) can sliced water chestnuts, drained and rinsed

4 to 6 bunches bok choy, tatsoi, pak choy, or similar vegetable (about 1½ pounds or 14 to 16 cups chopped)
8 ounces raw whole cashews (about 1½ cups)
1 cup chicken stock, divided
2 tablespoons arrowroot powder or cornstarch
1 tablespoon coconut water vinegar or apple cider vinegar
2 teaspoons sea salt
Serve with rice or caulirice

1. Heat a wok over medium-high heat (you can also use a very large sauté pan). Add the oil, garlic, and galangal and cook about 1 minute, until fragrant.
2. Add the chicken and cook, stirring frequently, until thoroughly done, about 5 to 8 minutes.
3. Add the mushrooms, bamboo shoots, and water chestnuts. Cook 3 to 4 more minutes, stirring frequently, until mushrooms are mostly cooked.
4. Add the bok choy, cashews, and ½ cup of the stock. Cook until the greens start to wilt, about 3 to 4 minutes, stirring frequently.
5. In a small bowl, mix arrowroot powder, vinegar, and salt with the remaining ½ cup of stock to make a slurry. Add the slurry to the wok and stir until thickened, about 2 more minutes. Taste and add more salt, as needed, before serving.
6. Serve over rice or cauliflower rice.



Vietnamese-Style Spring Rolls with Peanut Sauce

PREP TIME

30 minutes

COOK TIME10 minutes if using raw
shrimp**YIELD**

12-16 spring rolls

½ cup peanut butter, cashew or
tahini butter

2 tablespoons rice vinegar

2 tablespoons soy sauce or gluten
free tamari or coconut aminos

2 tablespoons maple syrup

1 teaspoon toasted sesame oil

¼ cup water

1 ½ pounds medium shrimp, peeled
and deveined

½ cup chopped green onion

½ cup chopped cilantro

¼ cup chopped mint

½ English cucumber, cut into
matchsticks

1 cup mung bean sprouts

4 ounces vermicelli rice noodles

1 package rice paper or spring roll
wrappers, about 12-16 wrappers

- 1. MAKE PEANUT SAUCE:** Add peanut butter, rice vinegar, soy sauce, maple syrup, sesame oil and water to a small bowl. Whisk together until creamy. At first it will look like it's not going to come together, but keep whisking and it will.
- 2. COOK SHRIMP:** bring a pot of water to a boil. Add shrimp and cook 2-3 minutes until opaque. Drain. Alternatively, use already cooked shrimp.
- 3.** Prep rice paper and rice noodles according to package directions.
- 4.** For each spring roll wrapper, add a little of each of the veggies and a small handful of rice noodles to the middle of the wrapper. Place 3 shrimp in a row above the veggies and noodles. Roll from the bottom. Once you get to the shrimp, fold in the sides, and then continue rolling the rest of the way.
- 5.** Serve with the spring rolls with the peanut sauce on the side.



DESSERT

Spiced Candied Pecans

PREP TIME

10 minutes

COOK TIME

40 minutes

YIELD

about 2 cups

¼ cup brown sugar
2 teaspoons cinnamon
1 tsp nutmeg
½ tsp allspice
¼ tsp cardamom
½ teaspoon salt
2 cups unsalted pecans halves
1 egg white

1. Preheat the oven to 300°F. Line a large baking sheet with a silicone baking sheet or parchment paper.
2. In a medium bowl combine sugar, spices and salt.
3. In a separate bowl, whisk the egg white until frothy.
4. Add the pecans to the whisked egg white and toss until the pecans are well coated.
5. Add the sugar and spice mixture and toss to combine.
6. Spread the pecans onto the prepared baking sheet. Bake for about 40 minutes, stirring halfway through.
7. Remove from the oven and let the pecans cool on the baking sheet before serving.



TIP: Replace the walnuts in the [Citrus Fig and Walnut Salad](#) for an extra delicious punch of flavor!



Chia Pudding And Tropical Fruit Parfait

PREP TIME

20 minutes + sitting +
chilling time

COOK TIME

none

YIELD

3 - 4 servings

1 cup milk, or coconut milk
1 teaspoon vanilla
3 tablespoons maple syrup or sweetener of choice
Pinch sea salt
¼ cup chia seeds
1 cup diced mango
1 cup diced papaya
½ cup diced kiwi
¼ cup pomegranate seeds

1. In a medium bowl, whisk together milk, vanilla, maple syrup and salt. Stir in chia seeds. Let sit at room temperature for 1 hour, stirring occasionally. Place in the refrigerator and chill until cold, about 2 hours.
2. Gently toss mango, papaya, kiwi and pomegranate seeds.
3. In parfait glasses, soda tumblers or wine glasses, place a large heaping spoonful of chia pudding on the bottom, then a large heaping spoonful of fruit, then more chia pudding, then more fruit. Serve!



TIP: You can use any mix of tropical fruit you like, or use berries or any other fruit you like!



About the Creators of this Book

Dr. Sarah Ballantyne, PhD

FOUNDER OF NUTRIVORE

Award-winning public speaker, New York Times bestselling author and world-renowned health expert, Dr. Sarah Ballantyne, PhD believes the key to improving public health is scientific literacy. She creates educational resources to help people improve their day-to-day diet and lifestyle choices, empowered and informed by the most current evidenced-based scientific research.



Charissa Joy, AOS

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Charissa Joy has over 15 years of experience working in the wellness space. Charissa has many roles on the team. She is Dr. Sarah's right hand woman and touches every part of Dr. Sarah's businesses. She manages all communications for Nutrivore, both external and internal. She is the project and team manager. She handles all marketing internal and external marketing, as well as all brand/affiliate partnerships.



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Nicole Anouar has a B.A in graphic design from the University of San Francisco and specializes in branding and educational design for healers and health professionals in the online space. With 8+ years of education and practice in graphic design, content marketing and ancestral lifestyle tradition, Nicole expresses her passion for truth and her love for alternative living into the work she does every day.



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Denise is a health researcher and author of the best-selling book, "Death By Food Pyramid"—an award-winning exposé of the forces that shaped our dietary guidelines and beliefs, and that's been featured in documentaries, UPenn medical writing curricula, the Nutritional Therapy Association certification program, and numerous other health education courses around the world.



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On Nutrivore.com she is a researcher, writer, and content creator and is responsible for developing and maintaining the expanded Nutrivore Score database of over 7,500 foods (plus many of the nerdy puns sprinkled throughout the website!).

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