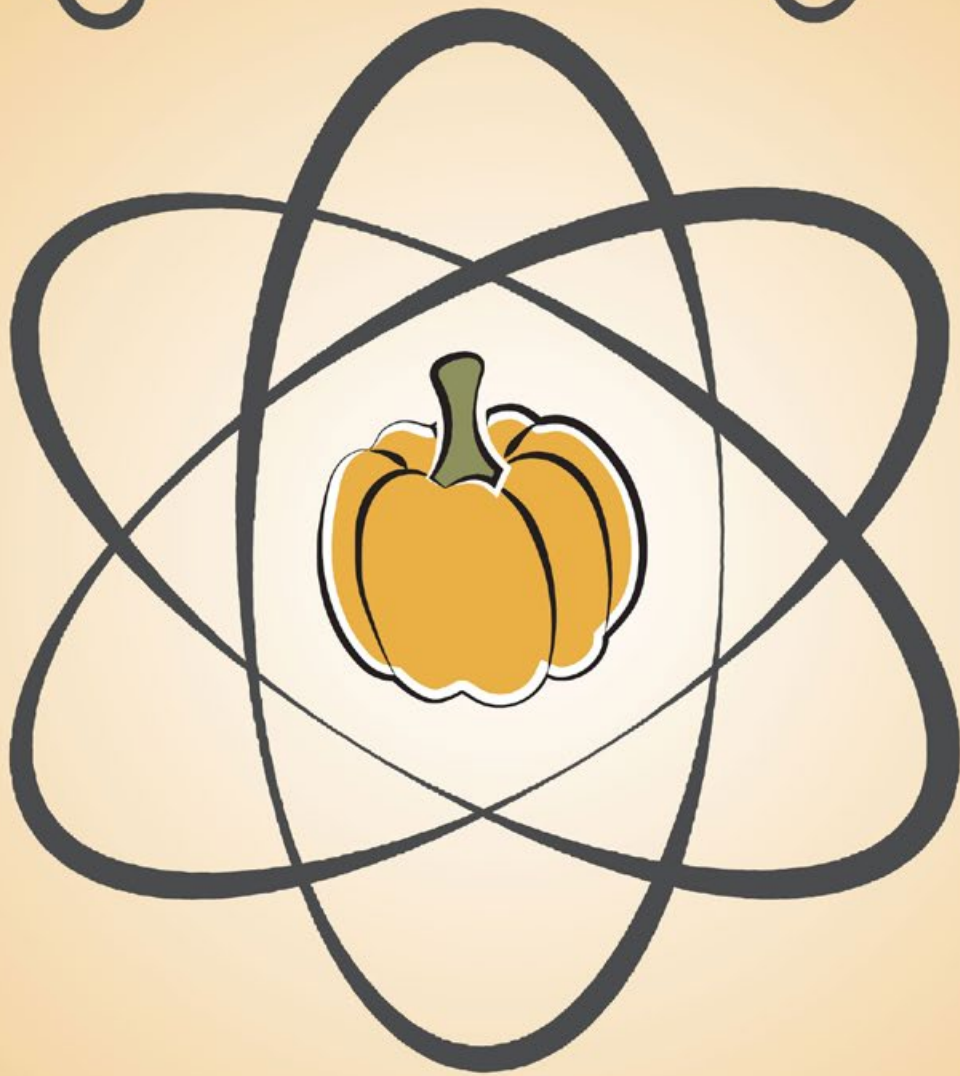


Nutrivore

GUIDE TO



Root Vegetables

BY THE TEAM AT NUTRIVORE

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Introduction to Root Veggies

They might grow beneath the ground, but that doesn't mean they're lowly! Root veggies are among the most nutrient-dense carbs in the plant kingdom, boasting an impressive array of vitamins, minerals, fiber, and phytonutrients. They were also one of the earliest foods consumed by humans: archeological evidence suggests people were roasting them at least 170,000 years ago (and likely eating some raw well before then!).

Even today, in many parts of the world, root vegetables are more important as a staple food than grains—especially West and Central Africa, and Oceania. Their versatility, along with their ability to store without spoiling for long periods after being harvested, has made them important crops for numerous societies and regions.

But, the perks of root veggies go well beyond their convenience. Let's take a look at these amazing veggies and the ways they benefit our health!

Root Veggies



CASSAVA



POTATO



SWEET POTATO



PARSNIP



BUTTERNUT SQUASH



YACON



BEETS



RUTABAGA



RADISH

What Are Root Veggies?

Like many edible plants, the term “root vegetable” can mean different things depending on whether we use a botanical definition or a culinary one. Since we’re talking about food, we’ll go with the latter: root vegetable refers to any vegetable that grows beneath the ground! This includes not only “true” roots (like sweet potatoes and yacon), but also bulbs (like onions and garlic), rhizomes (like ginger and lotus root), corms (like taro and water chestnuts), and tuberous stems (like potatoes and Jerusalem artichokes).

As you might imagine, that offers us quite a few varieties and options in the root veggie world! Some of the most commonly eaten root vegetables include:

- BEETS
- BURDOCK ROOT
- CARROTS
- CASSAVA (ALSO KNOWN AS YUCA)
- CELERY ROOT (AKA CELERiac)
- CHICORY ROOT
- DAIKON
- FINGERROOT
- GARLIC
- GINGER
- HORSERADISH
- JERUSALEM ARTICHOKES (AKA SUNCHOKES)
- JICAMA
- KOHLRABI
- LOTUS ROOT
- ONIONS
- PARSNIPS
- POTATOES
- RADISHES
- RUTABAGAS
- SHALLOTS
- SWEET POTATOES
- TARO
- TURMERIC
- TURNIPS
- WATER CHESTNUTS
- YACÓN
- YAMS (yep, they’re not the same as sweet potatoes! Even though “yam” is often used interchangeably with “sweet potato,” they actually belong to an entirely different plant family, and are distinguished by their rough, bark-like skin)



What Makes Root Veggies So Great?

Root veggies don't always get as much nutritional attention as their non-starchy counterparts (hello, leafy greens and crucifers!), but they actually contain a wealth of health-promoting fibers, micronutrients, and phytonutrients. The exact mix of compounds varies considerably from veggie to veggie, but one thing is universally true: every root veggie offers something special! Here's a rundown of what they can deliver.

Prebiotic Carbohydrates

Root veggies contain an amazing mix of carbohydrates with prebiotic activity (that is, feeding the beneficial species of bacteria in the gut). Depending on the specific root veggie, you'll find any combination of resistant starch, fructooligosaccharides, inulin, or pectin—all of which improve not only gut health, but also the various other body systems affected by the state of our gut!

Resistant starch is among the most famous of these prebiotic carbohydrates. It's a type of highly fermentable, insoluble fiber that "resists" the action of

human digestive enzymes, due to its molecular structure. Rather than being fully broken down in the small intestine like most starches, it passes on to the colon to become food for important gut microbes (which then ferment the starch to produce short-chain fatty acids like acetic acid, propionic acid, and butyric acid—all of which have awesome health properties of their own!).

Both human and animal studies have shown that resistant starch and its **short chain fatty acid** (SCFA) metabolites can improve intestinal barrier function, reduce the production of colon cancer precursors, help regulate macronutrient metabolism, increase insulin sensitivity, lower blood sugar responses after high-carb meals, reduce hunger, increase satiation, improve blood lipids, and help combat obesity. There's even evidence that resistant starch helps boost immunity, due to its influence on immune cell production and inflammatory compounds in the gut!

On top of that, the SCFAs produced via bacterial fermentation serve as the main food source for intestinal epithelial cells, giving them a huge role in promoting gut health. These unique fats have also been shown to reduce the risk of inflammatory diseases, maintain a healthy gut barrier, and aid in the absorption of important minerals (including copper, calcium, magnesium, iron, and zinc).



Potatoes that have been cooked and cooled are an excellent source of resistant starch (the cooking-and-cooling process modifies the starch structure to become resistant). But, cassava, yam, water chestnuts, and taro also contain resistant starch!

Meanwhile, **inulin** and **fructooligosaccharides** are soluble fibers that are similar in nature, distinguished mainly by their structural differences (inulin has a longer structure with more cross-links, whereas fructooligosaccharides are shorter and linear).

Both have amazing prebiotic properties, significantly boosting populations of **Lactobacillus** and **Bifidobacterium**—which collectively carry out a huge number of roles, including producing vitamins, preventing pathogens from colonizing the gut mucosa (including *E. coli*), protecting against yeast overgrowths, improving the gut barrier function, reducing endotoxin transport, exerting anti-cancer and anti-diabetic effects, and increasing the generation of SCFAs in the gut. Inulin and fructooligosaccharides have also been shown to improve the absorption of calcium and other minerals in the intestine (in fact, studies have shown these fibers improve bone health in humans!), combat constipation, and reduce blood cholesterol and triglyceride levels.

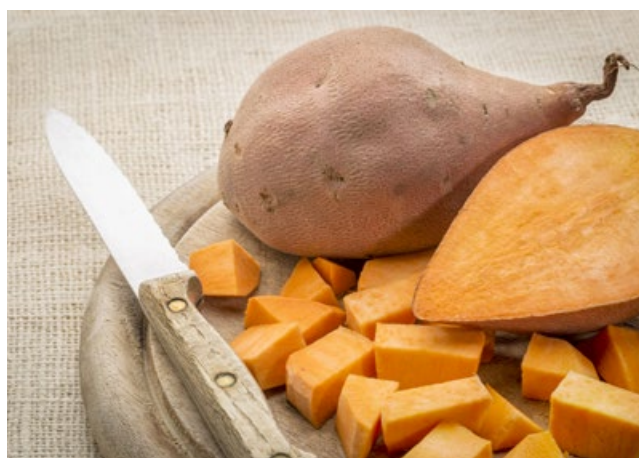
Inulin and fructooligosaccharides are particularly abundant in chicory root, Jerusalem artichokes, onions, yams, burdock root, jicama, and yacon!

Root veggies also supply **pectin**, a potent prebiotic fiber made up of a long chain of indigestible sugars. Although pectin is more commonly known for being an ingredient that helps thicken jams and jellies, it also possesses a number of benefits for humans! Across studies, pectin has been shown to alter the ratio of gut bacteria in favorable ways, as well as generate SCFAs—with a number of downstream effects such as lowering blood sugar levels, delaying gastric emptying, exerting protective effects against colon cancer, reducing blood levels of insulin and sugar, enhancing the absorption of some minerals, promoting regularity, protecting against pathogenic infections in the gut, and binding to heavy metal ions (in turn reducing their retention and protecting against toxicity). Pectin has also been shown to modulate the immune system, likely through its effects on the gut microbiota—giving it a beneficial role in conditions like allergies.

Among the root veggies, pectin is found in the highest quantities in carrots, turnips, potatoes, sweet potatoes, burdock root, and chicory root.

Phenomenal Phytonutrients

In order to survive in the challenging environment underground, root vegetables produce a number of phytonutrients as defenses—allowing them to evade predators and pathogens in the soil, as well as triumph over competing plants. Luckily for us, these phytonutrients come with a huge range of benefits for human health!



For example, root veggies with yellow or orange coloration (such as carrots and sweet potatoes) are high in **carotenoids**—plant pigments that increase resistance to oxidative stress, reduce inflammation, and have been shown to support vision health (particularly age-related eye diseases like macular degeneration and cataracts). Research shows a high intake of carotenoids could even protect against metabolic syndrome and diabetes!

Betalains are another class of red to yellow pigments found in certain root veggies (particularly beets, but also some less-common tubers like ulluco—an important crop in the Andean region of South America). Along with serving as powerful antioxidants, betalains have strong anti-inflammatory effects. Research suggests betalains could reduce the risk of cancer, cardiovascular disease, type 2 diabetes, and potentially neurodegenerative diseases, while also protecting the liver and kidney from damage. They're also capable of helping improve blood lipid and blood sugar levels!

Many root veggies also contain **anthocyanins**—another type of plant pigment with cardioprotective, neuroprotective, anti-inflammatory, blood-sugar-lowering, and anti-cancer properties. Studies suggest they could help protect against heart disease and diabetes, and may even have pain-reducing properties. These phytonutrient pigments impart blue, purple, or deep red colors to plants, and are found in radishes, sweet potatoes, turnips, red onions, cassava, and carrots.

Root vegetables also contain an array of **polyphenols**—a category of phytonutrients with significant antioxidant and anti-inflammatory properties. These compounds play a huge role in protecting against cancer, heart disease, diabetes, asthma, osteoporosis, neurodegenerative diseases, and other conditions associated with oxidative stress. Although thousands of polyphenols exist, some of the most common in root veggies include:

- **QUERCETIN** (found in radishes, carrots, chicory root, garlic, jicama, parsnips, burdock root, onions, beets, celery root, kohlrabi, potatoes, rutabagas, sweet potatoes, taro, and cassava), which has been shown to suppress inflammation in the brain and promote a healthy gut barrier.
- **APIGENIN** (found in carrots, cassava, onion, rutabagas, horseradish, chicory root, and celery root), which has been shown to reduce inflammation, protect against cancer and diabetes, improve brain health, reduce pain, and induce a calming effect.
- **KAEMPFEROL** (found in beets, carrots, water chestnuts, onions, radish, celery root, and chicory root), which can reduce inflammation, regulate the immune system, protect against cancer, act as an antimicrobial, prevent diabetes, reduce cardiovascular disease risk factors, prevent neurodegenerative diseases (like Alzheimer's disease), improve bone health, and aid weight loss.
- **LUTEOLIN** (found in carrots, beets, water chestnuts, celery root, rutabagas, sweet potatoes, horseradish, taro, kohlrabi, chicory root, and burdock root), which is strongly neuro-protective with anti-cancer activity, along with being able to reduce inflammation, regulate the immune system, reduce allergic responses, prevent toxicity associated with chemotherapy and radiation, and reduce pain.

- **HYDROXYCINNAMIC ACIDS** such as p-coumaric acid, caffeic acid, ferulic acid, chlorogenic acid, and sinapic acid (found in carrots, radishes, parsnips, onions, beets, chicory, garlic, onion, and turnips), which have powerful anti-diabetic, anti-inflammatory, antioxidant, and anti-cancer effects; they may help protect against neurodegenerative diseases and other conditions related to oxidative stress.

Root veggies from the Brassica family (such as horseradish, rutabaga, turnips, radishes, and kohlrabi) are rich in **glucosinolates**—a type of sulfur-containing compound that gets converted into bioactive isothiocyanates when the plant cells are chewed, cut, crushed, or otherwise damaged. Research spanning human epidemiology, animal models, and in vitro experiments shows that isothiocyanates have significant anti-cancer, anti-diabetic, cardioprotective, antimicrobial, antioxidant, and neuroprotective effects! In experiments, the isothiocyanates sulforaphane and indole-3-carbinol have shown particularly impressive abilities to kill cancer cells and halt cancer cell growth.

Root veggies in the Allium family (which include onions, garlic, and shallots) are also uniquely high in **organosulfur compounds**, which show evidence of protecting against stomach and colorectal cancers (due to inhibiting carcinogenesis in various parts of the digestive tract, modifying detoxification enzymes, and preventing DNA damage).

A number of root veggies also contain **saponins**—chemical compounds that can reduce cholesterol levels, protect against oxidative stress, inhibit tumor growth, improve lipid metabolism, and even protect against obesity! Saponins can be found in yams, potatoes, onions, garlic, sweet potatoes, beets, and cassava!

Magnificent Micronutrients

Root veggies are rich in a number of vitamins and minerals! Although they vary in their exact nutritional profiles, their role as storage organs (storing nutrients and energy for the rest of the plant) means they tend to accumulate specific micronutrients. These 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). One cup of Jerusalem artichokes has 43% DV of copper! One cup of cooked sweet potato contains 22% of the DV for copper and the same amount of turnips has 12% DV. Other high-copper root veggies include kohlrabi, cassava, potato, beets, and leeks.
- **VITAMIN B₉ (FOLATE)**, an essential B vitamin that plays roles in blood cell production, the formation of genetic material (including DNA), cell growth, cardiovascular health, cancer protection, and cognitive and neurological health. A cup of cooked beets contains 37% of the DV for folate, and a cup of cooked parsnips contains 22% of the DV. Cassava and leeks are also notable sources of folate.
- **IRON**, a mineral needed for the function of numerous proteins involved in electron transport, energy metabolism, oxygen transport and storage, DNA replication and repair, free radical

scavenging, and oxidative processes. One cup of Jerusalem artichokes contains 12% of the DV for iron. Sweet potatoes, potatoes, cassava and beets also contain notable amounts.

- **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!). High-magnesium root veggies include Jerusalem artichoke, cassava, daikon, rutabaga, sweet potatoes, and potatoes.
- **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. Jerusalem artichoke, beets, cassava, leeks, parsnips, and sweet potatoes are high in manganese.
- **VITAMIN B3 (NIACIN)**, a water-soluble B vitamin that's needed for over 400 enzymes involved in DNA repair, fatty acid synthesis, antioxidant systems, detoxification, hormone synthesis, and macronutrient breakdown. One cup of cassava has 14% the DV for niacin. Jerusalem artichokes, sweet potatoes, potatoes, and yacon are also great sources!
- **VITAMIN B5 (PANTOTHENIC ACID)**, a water-soluble vitamin needed for metabolizing many drugs and toxins, as well as forming derivatives that participate in the synthesis of cholesterol, fatty acids, melatonin, the neurotransmitter acetylcholine, steroid hormones, heme, and vitamins A and D. Jerusalem artichokes, sweet potatoes, potatoes, garlic, and parsnips are high in this nutrient.
- **POTASSIUM**, an electrolyte mineral with roles in a wide variety of life-sustaining processes such as heart function, muscle contraction, nerve impulse transmission, blood pressure control, blood pH, and fluid balance. Jerusalem artichokes, kohlrabi, turnips, parsnips, cassava and sweet potatoes are good sources of potassium.
- **VITAMIN B1 (Thiamin)**, a water-soluble vitamin that serves as a cofactor for a variety of enzymes involved in carbohydrate and amino acid metabolism, RNA and DNA production, and generating energy for the Krebs cycle. One cup of Jerusalem artichokes contains 10% the DV for thiamin, and rutabaga contains 11% the DV. Garlic, cassava, parsnips, potatoes, yacon, and yams are also some delicious thiamin-filled sources.
- **VITAMIN B6 (PYRIDOXINE)**, a group of six water-soluble compounds required by over 100 different enzymes to carry out functions in protein metabolism, fatty acid metabolism, neurotransmitter production, gluconeogenesis, hemoglobin synthesis, the release of glucose from glycogen, and energy metabolism (particularly the production of ATP in the Krebs cycle). Root veggies high in vitamin B6 include cassava, Jerusalem artichoke, kohlrabi, and sweet potato.
- **VITAMIN C**, a water-soluble vitamin with powerful antioxidant properties, with important roles in the immune system and collagen production. Kohlrabi contains 93% of the DV for vitamin C in a one cup serving, while cassava has an impressive 113%. Other awesome sources of vitamin C include Jerusalem artichoke, leeks, parsnips, radish, rutabaga, and turnips.

Health Benefits of Root Veggies

Given how many awesome things they contain, it shouldn't come as a surprise that root veggies have demonstrated wide-ranging health benefits and protection against a number of diseases. When studied as a general food group, they've been shown to be protective against the following conditions:



All-cause mortality

[In a 2019 review of available meta-analyses](#), every 100 g increase in daily root vegetable consumption was associated with a 24% reduction in all-cause mortality!



Mental health

A [2021 cross-sectional study](#) found that among family caregivers of people with dementia, higher root vegetable consumption was associated with lower incidence and severity of anxiety and depression.



Cancer

[A prospective study from 2005](#) found that among Swedish women, root vegetable consumption was associated with a lower risk of kidney cancer. In fact, root veggies had the strongest inverse association with kidney cancer out of any vegetable sub-group: eating at least one serving per day (compared to none) was linked to a 51% decrease in risk!

[Another prospective study from 2006](#) found that eating at least three servings of root vegetables per week, compared to less than half a serving per week, was associated with a 57% lower risk of stomach cancer.

And, [a 2012 analysis of the European Prospective Investigation into Cancer and Nutrition](#) found that root vegetable intake was significantly protective of aggressive forms of the disease, reducing risk by 13%.



Cognitive decline

[A 2011 prospective cohort study](#) found that higher root veggie consumption was associated with reduced cognitive decline over time—specifically, cognitive flexibility and cognitive function. In fact, people with the lowest root vegetable consumption had over three times the cognitive decline of people with the highest intake!



Diabetes

Root veggies may even be protective against diabetes! In a [2012 analysis of the EPIC-InterAct prospective study](#), encompassing over 16,000 participants, root veggies were the only fruit or vegetable subtype inversely associated with diabetes (a 13% reduction in risk for the highest versus lowest quartile of intake).

Specific Veggies

Because they belong to a number of different plant families (and therefore possess unique phytochemical and nutrient profiles), root veggies are more often studied individually than as a collective group. And when we look at the science on a veggie-by-veggie basis, their health perks are even more dazzling!

- **BEETS:** Research shows beets are awesome for cardiovascular health, due to their ability to reduce blood pressure, blood sugar, and blood glucose! They can even potentially benefit athletic performance due to their nitrate content, as well as reduce muscle soreness. Various components of beets have also been shown to inhibit cancer growth and induce autophagy.
- **CARROTS:** Along with famously supporting eye health (due to their rich content of carotenoids), carrots are incredibly beneficial for the gut! Specifically, a variety of studies have shown that carrot consumption alters the composition and diversity of the gut microbiota, improves intestinal function, and reduces fecal pH.
- **CHICORY ROOT:** Incredibly rich in fermentable fibers, chicory root has a major role in promoting gut health and feeding beneficial intestinal bacteria (as well as promoting regularity and relieving constipation). It's also been shown to help modulate the immune system, reduce DNA mutations, protect against liver damage, and protect against pathogenic infections (whether from bacteria, fungi, parasites, or viruses!).
- **JERUSALEM ARTICHOKEs:** Incredibly rich in prebiotic fibers, Jerusalem artichokes have been shown to help with digestive health, regulate blood sugar and blood pressure levels, reduce cholesterol levels, and exert anti-cancer activities!
- **RADISHES:** Radishes are particularly famous for their anti-diabetic activities—promoting glucose uptake, reducing glucose absorption in the intestine (by inhibiting α -amylase and α -glucosidase enzymes involved in sugar breakdown), and affecting hormones involved in glucose regulation (including adiponectin and insulin). Radishes may even help prevent diabetes-induced oxidative damage, due to their array of antioxidant phytonutrients.
- **RUTABAGAS:** Rutabagas are particularly high in glucosinolates that possess antioxidant properties, and which have been shown to reduce inflammation and inhibit the growth of colorectal, breast, and prostate cancer cells.
- **SWEET POTATOES:** Sweet potatoes exhibit antioxidative, anti-inflammatory, anti-obesity, liver-protective, anti-aging, blood-sugar-lowering, and immunomodulatory properties. Purple-fleshed sweet potato is a particular rockstar here, with studies showing its various components can exert anti-cancer properties against colon tumors, stomach cancer, breast cancer, and bladder cancer cells. Not only that, but sweet potatoes also show promise for enhancing cognitive performance and memory, in part by reducing inflammation and preventing free radical damage in the brain.
- **TURNIPS:** Turnips have been shown to exhibit anti-tumor, anti-diabetic, antioxidant, anti-inflammatory, anti-hypertensive, kidney-protective, liver-protective, and even pain-reducing properties!

- **YAMS:** Yams have shown positive effects on brain function, cancer protection, diabetes, and even weight loss! Many of these benefits are related to its phytosteroid diosgenin, which demonstrates significant hypoglycemic, antioxidant, anti-inflammatory, cholesterol-lowering, and anti-cancer properties (particularly against colon cancer, leukemia, squamous carcinoma, liver cancer, gastric cancer, breast cancer, and lung cancer cells). Yam may even help boost brain health, with both animal and human studies showing improvements in cognitive function, memory, and learning.

What's the Deal With Potatoes?

For years, potatoes have received a fair bit of negative press—the vast majority of which is undeserved! Although potatoes can indeed be problematic for people with nightshade sensitivity, they're a far cry from the empty-calorie, high-glycemic starch they're often portrayed as. In fact, potatoes are good sources of vitamin C, vitamin B6, potassium, manganese, niacin, magnesium, folate, and even iron! With a Nutrivore score of 272, they're considered a medium nutrient-dense food. They also routinely rank high in satiety index studies, suggesting they're actually one of the most satiating foods we can eat!



Part of the potato confusion is due to the way they're commonly prepared and eaten. In observational studies, potato consumption is often in the form of fried foods (such as French fries or potato chips) rather than more healthful preparations (like baking or boiling)—making it hard to determine whether subsequent health outcomes are from the potatoes themselves, or from the processing methods and additional ingredients accompanying them. In fact, studies that adjust for confounders generally show that non-fried potatoes are neutral when it comes to diabetes and cardiovascular disease risk, and may even be linked to a reduced risk of total mortality.

Likewise, some bioactive compounds in potato (including alpha-chaconine and gallic acid) have been shown to induce the death of some cancer cells, including prostate, colon, and liver. The resistant starch in potato can also help improve insulin sensitivity, boost satiety, decrease blood sugar levels, promote feelings of fullness, and reduce food intake.

In other words, there's no reason to view potatoes as an exception to the "root veggies are awesome" rule! Spuds deserve a place at the table just as much as their rooty cousins.

Root Vegetable Nutrivore Scores

Root veggies vary considerably in their Nutrivore scores, with radishes topping the list at a whopping 5863 (skyrocketing to 6660 for the white icicle variety of radish)! The full list includes:

Acorn squash, raw	297
Beets	2013
Burdock Root	182
Butternut squash, raw	670
Carrots	899
Cassava	224
Celery root (AKA celeriac)	345
Chicory Root	207
Garlic	5622
Ginger	192
Horseradish	850
Hubbard squash, raw	358
Jerusalem artichokes (AKA sunchokes)	195

Jicama	234
Kohlrabi	2497
Lotus Root	351
Onions	380
Parsnips	372
Potatoes	272
Pumpkin, raw	1036
Radishes	5863
Rutabagas	766
Sweet potatoes	379
Spaghetti squash, raw	286
Taro	178
Turnips	1954

A Note on Contaminants

Among the many impressive features of root vegetables is one potential bummer: their role as plant storage organs makes them uniquely capable of accumulating heavy metals (especially lead and cadmium), pesticides, microplastics, and other contaminants from the surrounding soil. Analyses of root veggies from polluted environments show they tend to have a higher concentration of contaminants than other edible plant parts.

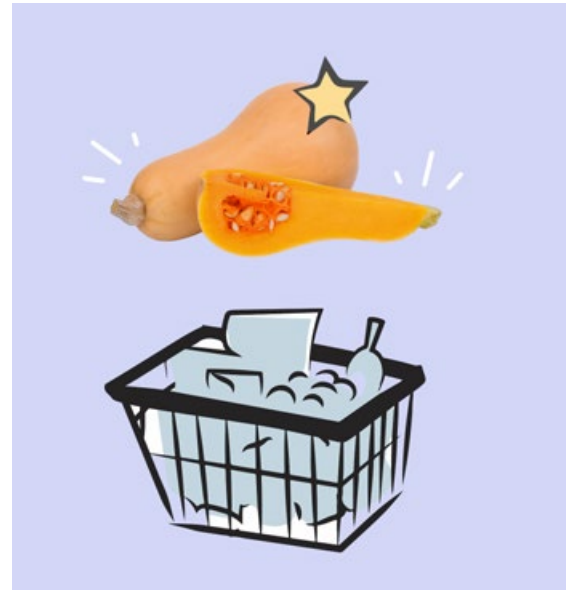
Luckily, most of us don't need to worry about the contaminants in root veggies, even when buying conventional, since they aren't high enough to harm human health. If you do live in an area with high levels of industrial pollution, you can reduce your exposure by making sure to peel and cook your root veggies before eating them, which can reduce the levels of contaminants by over 50%! Other options are to opt for organic root vegetables, or buy from farms located away from industrial pollution, or shop at farmers markets (where you'll be likely to encounter vendors who use sustainable, low-pollution farming methods). And of course, this is yet another reason to advocate for solutions to pollution.

Some Practical Pointers

Root veggies tend to be hardy (no surprise, given they've already roughed it underground!), but selecting and storing them for quality and freshness helps ensure you get the best root veggie bang for your buck. Here are some tips to keep in mind!

Selection:

- In general, root veggies should be springy and hard—the very opposite of selecting ripe fruit!
- Select veggies that feel heavy for their size.
- Avoid buying root vegetables with gashes, bruises, soft spots, wrinkling, or other signs of damage.
- If you're choosing root veggies that have their greens attached (such as a bunch of beets or radishes), check to make sure the stems and leaves are bright, firm, and not wilting.
- When it comes to potatoes, choose ones that are smooth (with small "eyes"), well-shaped, and free from green spots, shriveling, or sprouts.



Storage:

Although root veggies can be left at room temperature without spoiling for longer periods than many other vegetables, they can also begin sprouting or decomposing when exposed to light or warmth for extended periods! As a general rule, they store best when unwashed, in cool, dark, humid spaces, at temperatures between 32 and 40 degrees F. Keeping them in paper or plastic bags in the crisper is ideal. For root veggies that have their greens still attached, removing the greens and storing them separately can help prevent early spoilage.



Seasonality:

- **BEETS**: Beets are typically in season from late summer through late fall or early spring.
- **CARROTS**: Carrots are available year-round, but they are at their best in the summer and fall.
- **CASSAVA**: Cassava can be harvested year-round!

- **CELERY ROOT:** Celery root's peak season is the fall and spring.
- **JERUSALEM ARTICHOKE:** Jerusalem artichokes are in season in the late fall and winter.
- **KOHLRABI:** Kohlrabi is also a cool-weather crop, and is typically in season from early spring through late fall.
- **PARSNIPS:** Parsnips are at their best in the fall and winter.
- **POTATOES:** Potatoes are available year-round, but their peak season is in the fall and winter.
- **RADISHES:** Radishes are a spring and fall crop, with peak season being in the cooler months.
- **RUTABAGAS:** Rutabagas are in season from early fall through spring.
- **SWEET POTATOES:** Sweet potatoes are in season in the fall, although they're generally available year-round.
- **TARO:** The best season for taro is typically late summer.
- **TURNIPS:** Turnips are a cool-weather crop and are typically in season from late fall through early spring.

It's worth noting that growing seasons can vary depending on the location and climate, so this list may not apply to all regions. It's always a good idea to check with local farmers or markets to see what's in season in your area!

Recipes



BREAKFAST

Pork and Winter Squash Frittata

PREP TIME

15 minutes

COOK TIME

40 minutes

YIELD

6 servings

3-4 thick slices of bacon, chopped
1 pound ground pork
2 cloves garlic, minced
1 tablespoon fresh sage, chopped
½ teaspoon salt or truffle salt
¼ teaspoon black pepper
¼ teaspoon nutmeg
2 sprigs thyme
3 cups winter squash, peeled, seeded and cut
into a quarter to half inch dice
2 cups arugula or baby kale
10 eggs, beaten

1. Place chopped bacon into a cold ovenproof skillet and then turn on the heat to medium-high.
2. Cook the bacon until crisp, about 8-10 minutes.
3. Turn the broiler on high to preheat the oven.
4. Add the ground pork, garlic, sage, salt, pepper, nutmeg, and thyme to the skillet. Brown, stirring frequently to break up pork, until pork is fully cooked, about 8-10 minutes.
5. Remove the stems of the thyme (carefully!) and add the squash. Cook until squash is tender, about 5-6 minutes. The length of time will depend on the variety of squash you are using and just how finely diced it is.
6. Add arugula and beaten eggs. Let cook on the stovetop for 1 to 2 minutes, stirring a couple of times.
7. Place the skillet in the oven and broil until the eggs are completely cooked- puffed up and starting to brown on top- about 7-10 minutes, varies oven to oven so watch carefully.



Plantain Waffles

PREP TIME

5 minutes

COOK TIME

10-15 minutes

YIELD4-inch-square
Belgian-style (thick)
waffles

2 large green plantains (2½ to 3 cups chopped)

4 large eggs (if plantains are extra-large,
add an extra egg)

2 teaspoons vanilla extract

3 tablespoons oil of choice (coconut,
canola, etc.)

⅛ teaspoon sea salt

½ teaspoon baking soda

1. Peel the plantains and place the pieces in a blender with the eggs. Blend to form a smooth batter.
2. Add the rest of the ingredients to the blender and blend on high for an additional minute.
3. Heat a waffle maker to high heat. Pour batter into the waffle maker and cook, according to the manufacturer's directions, about 4½ minutes for Belgian-style (thick) waffles. Remove the waffle from the waffle maker. Repeat with the remaining batter and serve.



Sometimes this batter will thicken while it sits; if it does, simply blend it for an additional 10 seconds. To freeze, let the waffles or pancakes cool on a cooling rack, then place in a single layer on a baking sheet. Freeze for 4 to 6 hours or overnight. Remove from the baking sheet then transfer to an airtight container or freezer bag for long-term storage. Reheat from frozen in the microwave for 30 to 45 seconds or in a toaster or toaster oven, if you enjoy them crispy.



SIDES

Root Vegetable Casserole

PREP TIME

15-20 minutes

COOK TIME

1 hour 30 minutes

YIELD

8-10 servings

3 tablespoons olive oil or oil of choice
1 yellow onion, sliced into half moons
1 pound yellow summer squash or peeled zucchini, diced
2 cloves garlic, minced
2 cups chicken broth
1 cup white wine

1 teaspoon salt, plus more to taste
1 cup parmesan, romano or sharp cheddar cheese, divided (optional)
4 pounds (about 10 cups diced) root vegetables (use at least 4 different kinds, such as sweet potatoes, any variety of winter squash, green plantain, parsnip, carrot, boniato, etc.), diced into 3/4 inch pieces

1. Preheat the oven to 400°F.
2. Heat 1-2 tablespoons of olive oil in a skillet over medium-high heat, then add onion. Cook, stirring occasionally until browned, about 10 minutes.
3. Remove onions from the skillet and place in a 9"x9" casserole dish; set aside. Add another 1-2 tablespoons of olive oil and add summer squash to the pan. Cook, stirring occasionally, until browned, about 10 minutes. Add garlic and cook 2 more minutes.
4. Add broth and wine to the summer squash. Simmer until liquid reduces by two thirds, about 15 minutes.
5. Carefully pour the contents of the skillet into a blender. Blend on high for 30 seconds to 1 minute, until completely smooth.
6. Add salt and ½ cup cheese. Stir until cheese is melted. Taste and add extra salt, if needed. You want this sauce to be a little salty.
7. Toss diced root vegetables with caramelized onion in the casserole dish. Pour the sauce from the blender all over the root veggies. Sprinkle the remaining cheese on top.



8. Bake uncovered for 50-60 minutes, until root veggies are fully cooked. If the cheese is starting to burn, cover with a lid or foil. Let sit for 5-10 minutes before serving.



TIP: You have plenty of time while the onion and zucchini are browning and while broth is reducing to chop up all the root vegetables for the casserole. To make this ahead you can either do steps 1-6 the day before, and then bake before serving or fully cook the day before (bake for 40-45 minutes, until the root vegetables are cooked al dente) and then reheat for 30 minutes in the oven before serving.

* *Using the optional cheese will lower the overall Nutrivore Score of this recipe. However, the fats do help facilitate the absorption of certain nutrients and cheese adds wonderful flavor and is an excellent source of calcium! It is also good to remember that not every food we eat needs to be the pinnacle of nutrient density. So feel free to add the cheese!*

Balsamic Roasted Beets

PREP TIME

10 minutes

COOK TIME

45 minutes to 1 hour

YIELD

4-6 servings

6 to 8 medium beets, quartered
2 tablespoons balsamic vinegar
1 tablespoons extra-virgin olive oil
¼ teaspoon salt
¼ teaspoon black pepper
Fresh herbs, goat cheese and additional
balsamic vinegar to garnish, optional

1. Preheat the oven to 350°F. Lay a large piece of aluminum foil in a baking dish, lifting the sides to create an edge all the way around
2. Combine the beets, vinegar, oil, and salt. Pour into the foil. Fold the edges of the foil up and over the beets to make a pocket for the beets to cook in, sealing the edges closed. Alternatively, you can use a greased baking dish with a lid.
3. Bake for 45 minutes to 1 hour, until the beets are tender. Cook time will depend on the size of the beets.
4. Garnish with herbs, cheese, and vinegar if desired.



Cassava Fries

PREP TIME

15 minutes

COOK TIME

1 hour

YIELD

4-6 servings

2 ½ pounds cassava (also called yucca, yuca, manioc, tapioca root) or use malanga root

½ cup lard or duck fat (or half and half of each), melted

1 ½ teaspoons salt, to taste

1. Bring a large pot with 3 inches of boiling water to a boil on the stovetop.
2. Meanwhile, peel cassava. Cut big cylinders, about 3-4 inches long, down the length of the cassava. Cut each cylinder in half lengthwise, and then cut each half lengthwise again 2-3 times to make large wedges. Cassava can have a long stringy thread running down the middle of it—if you see that, trim it off your wedges.
3. Add cassava wedges to boiling water and boil, uncovered, for 10 minutes. Meanwhile, preheat the oven to 375°F. (Tip: place your rimmed baking sheet with your lard in the oven while it's preheating to melt your lard. It also speeds up the cooking a bit for that pan to be nice and hot when you add the cassava wedges.)
4. Drain cassava completely. Toss with lard on a rimmed baking sheet. Bake for 40 minutes, stirring and flipping at the 15 minute mark, 25 minute mark, and 35 minute mark. Cooking time will vary based on just how thick your wedges are. You want them to turn golden brown and be crisp on the outside.
5. Sprinkle and toss with salt, to taste.



Bacon Wrapped Spiced Pumpkin

PREP TIME

15 minutes

COOK TIME

40 minutes

YIELD20 appetizer portions, or
3-4 servings if serving as
a side dish

1½ pounds pumpkin or butternut squash,
peeled, seeded and cut into 2 inch chunks

1 teaspoon ground ginger

1 teaspoon cinnamon

1 teaspoon chopped fresh rosemary

2 tablespoons olive oil

1 tablespoon maple syrup

¼ cup chopped walnuts

10 ounces bacon (10 slices)

1. Preheat oven to 350°F. Place a wire rack (e.g., cooling rack, roasting rack) in a rimmed baking sheet. Line your baking sheet with foil to make clean up easier if desired..
2. In a mixing bowl, toss pumpkin chunks with spices, olive oil, maple syrup and walnuts. Cut bacon slices in half.
3. Wrap each spiced pumpkin chunk in a half slice of bacon, making sure to have a few walnut pieces wrapped inside the bacon too. Place on the wire rack oriented so that the ends of the bacon slice are on the bottom (this stops them from unraveling while cooking). Repeat with every piece of pumpkin.
4. Using a spoon, drizzle any remaining spice mixture and walnut pieces from the bottom of your mixing bowl over the top of each bacon-wrapped spiced pumpkin chunk.
5. Bake for 40 minutes.
6. **OPTIONAL:** for crispier bacon, broil on high for 2-3 minutes after baking.
7. Remove from oven and serve!



Scalloped Potatoes

PREP TIME

15-20 minutes

COOK TIME

50 minutes

YIELD

6-8 servings

1 ½ pounds potatoes, peeled and cut into
1 small head cauliflower, chopped, about 5 to 6 cups florets
2 ½ cups broth
2-3 cloves garlic, peeled and whole
¼ cup butter
1 egg
4-6 ounces shredded sharp cheddar cheese or gruyere,
divided (optional)
Salt and pepper to taste

1. Bring the broth to a simmer over medium-high heat and add the cauliflower and garlic. Simmer until cauliflower is slightly overcooked, about 15 minutes.
2. Meanwhile, preheat the oven to 375°F.
3. Slice the potatoes into very thin rounds, approximately ⅛ inch, using a mandoline slicer or sharp knife.
4. When the cauliflower is cooked, pour the broth mixture into a blender. Add the butter and blend on high until you have a completely smooth purée.
5. Beat the egg slightly in a bowl and then temper the egg. To temper the egg, add a spoon full of the hot cauliflower purée to the egg while stirring vigorously. Add another spoonful the same way. And then a third spoonful.
6. Now, add the tempered egg to the cauliflower purée and blend to combine.



7. Add salt and pepper. It should taste a bit over-salted.
8. If using, stir in half of the cheese until melted.
9. Lay the potatoes in the bottom of a 9 x 9 inch casserole pan or baking pan and pour the cauliflower puree over the top. Stir to make sure the potato slices are well coated in the sauce and then smooth out to make sure the potato slices are all lying flat. Top with remaining cheese if desired.
10. Cover with foil and bake for 30 minutes. Remove foil and then bake uncovered for 20-30 minutes until the potatoes are fork tender.

** Using the optional cheese will lower the overall Nutrivore Score of this recipe. However, the fats do help facilitate the absorption of certain nutrients and cheese adds wonderful flavor and is an excellent source of calcium! It is also good to remember that not every food we eat needs to be the pinnacle of nutrient density. So feel free to add the cheese!*

ENTRÉES

Meatball Winter Squash Casserole

PREP TIME

15-20 minutes

COOK TIME

20-25 minutes

YIELD

4-6 servings

3 pounds winter squash, peeled, seeded and cut into ½ inch cubes

2 tablespoons maple syrup

2 tablespoons fresh sage, chiffonade

2 cloves garlic, minced

½ cup chopped walnuts

¼ teaspoon cinnamon

1 ¼ teaspoon salt, divided

2 pounds ground pork (or other ground meat)

1 ½ teaspoon ground coriander

1 teaspoon ground cumin

⅛ teaspoon ground cardamom

½ teaspoon garlic powder

¼ teaspoon ground ginger

⅓ cup parmesan cheese (optional)

1. Preheat the oven to 425°F.
2. Toss the squash with the maple syrup, sage, garlic, walnuts, cinnamon and ¼ teaspoon salt. Place in a large casserole dish.
3. Mix the ground meat with the remaining 1 teaspoon salt and other spices until thoroughly combined. Form 1 ½– 2 inch meatballs and lay on top of the squash mixture.
4. Top with parmesan cheese if using.
5. Bake for 20-25 minutes until the meatball internal temperature reaches at least 160°F and squash is fork tender.



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Chow Mein

PREP TIME

10 minutes

COOK TIME

20 minutes

YIELD

3-4 servings

2-3 tablespoons oil

1 pound shrimp or 12 ounces chicken thigh, pork chop or beef flank steak, very thinly sliced

1 small onion, sliced

2 medium carrots, sliced

8 ounces sliced mushrooms, or rehydrated dried mushrooms, any variety

1 5 ounce can water chestnuts

1 5 ounce can sliced bamboo shoots

3 heads baby bok choy, chopped (about 4 cups)

½ cup broth

1 tablespoon soy sauce

1 tablespoon cornstarch, arrowroot starch or kuzu starch

Salt, to taste

3 green onions, sliced

1 pound noodles (egg noodles, soba, chow mein, lo mein, udon, rice noodles, kelp noodles etc.)

1. Heat a wok or large frying pan on the stove top over medium-high heat. Add 2 tablespoons oil to the hot wok.
2. Add protein of choice to hot oil. Cook, stirring constantly, until fully cooked, about 3 to 5 minutes. Remove from the wok and set aside.
3. Add onion, carrots and mushrooms to hot oil (if there's not much oil left in the wok, add another tablespoon before adding your veggies). Cook, stirring frequently, until vegetables are cooked to your liking, about 3 to 8 minutes.
4. Add water chestnuts, bamboo shoots and bok choy. If the veggies are releasing a lot of liquid into the wok, turn the heat up.



5. In a small bowl, whisk together broth, soy sauce and starch.
6. Add your cooked protein back to the wok and add the broth mixture to the mostly cooked veggies. Stir constantly until the sauce has thickened, about 1 minute.
7. Taste and season with salt, if needed.
8. Toss with prepared noodles.
9. Garnish with chopped green onion.

Pumpkin Chili

PREP TIME

15 minutes

COOK TIME

1 hour 20 minutes

YIELD

6-8 servings

1 medium pie pumpkin, peeled and cut into ½ inch cubes

1 large sweet potato, peeled and cut into ½ inch cubes

2 tablespoons oil

3 pounds ground beef, or ground meat of choice

2 onions, finely chopped

6-8 celery stalks, chopped

8-10 cloves garlic, chopped

3 bay leaves

3 tablespoons chili powder

1 ½ tablespoons cumin

1 teaspoon cinnamon

1 teaspoon nutmeg

2 teaspoons cocoa powder

2 teaspoons salt

1 teaspoon black pepper

¼ teaspoon cayenne (optional)

3 15-ounce cans diced tomato

1 6-ounce can tomato paste

2 cups pumpkin purée (fresh purée cans be made by blending some extra roast pumpkin, or use canned)

2 tablespoons chopped fresh basil

2 tablespoons chopped fresh oregano

3 tablespoons chopped fresh cilantro

1 bag/bunch fresh spinach, chopped

1. Toss pumpkin and sweet potato with oil. Spread on a baking sheet and bake at 350°F for 30 minutes or until soft and starting to brown.
2. Meanwhile, brown the meat with garlic, onion, celery and bay leaves in a large pot at medium-high heat. Stir only occasionally to not break up the meat into too small of pieces.
3. When meat is browned, add spices and cook until fragrant, about 3-4 minutes.
4. Add tomatoes, tomato paste, and pumpkin puree. Bring to a simmer and then reduce to low-medium heat. Simmer for 15 minutes until celery is soft, stirring occasionally.



5. Add fresh herbs and chopped spinach. Finally, add the roasted pumpkin and sweet potato.
6. Taste and season with more salt and pepper if desired.

New England Clam Chowder

PREP TIME

20 minutes

COOK TIME

35 minutes

YIELD

6-8 servings

4 thick slices bacon, chopped

1 onion, diced

2 to 3 stalks celery, thinly sliced

1 large carrot, diced

2 large potatoes, one peeled and grated and one peeled and cut into $\frac{3}{4}$ inch cubes

3 cups canned clam juice

3 5-to-6 ounce cans clams, drained

2 bay leaves

4 to 5 sprigs of thyme, leaves only

2 cups heavy cream or coconut cream

3 tablespoons chopped fresh parsley

Sea salt and black pepper, to taste

1. Place the bacon in a medium stockpot, then turn on the heat to medium-high. Cook, stirring occasionally, until the bacon is crisp.
2. Add the onion, celery, carrot, and cubed potato to the pot. Cook until fragrant, stirring occasionally, about 5 minutes.
3. Add the stock, clams, grated potato, bay leaves, and thyme. Bring to a boil, then reduce the heat to maintain a simmer for 20 minutes. Stir occasionally.
4. Add the coconut cream and parsley. Taste and season with salt and pepper. Cook for 1 to 2 minutes and serve.



TREATS

Carrot Parsnip Muffins

PREP TIME

20 minutes

COOK TIME

1 hour

YIELD

1 dozen muffins

4 large eggs

1 ½ cups sugar

½ cup oil

1 teaspoon vanilla

1 ½ cups grated carrot

1 ½ cups grated parsnip

1 ¾ cups plus 1 teaspoon flour, divided

1 teaspoon baking soda

1 teaspoon cream of tartar

1 teaspoon nutmeg

½ teaspoon allspice

½ teaspoon cinnamon

½ teaspoon cardamom

¼ teaspoon sea salt

1 cup chopped walnuts

1. Preheat oven to 350°F. Grease a muffin tin or line with muffin liners.
2. Whisk together eggs, sugar, olive oil and vanilla in a medium bowl. Add grated carrot and parsnip.
3. In a large bowl, combine 1 ¾ cups flour, baking soda, cream of tartar, nutmeg, allspice, cinnamon, cardamom, and salt. Use a spoon to push flour mixture to the sides of the bowl (like a volcano) and pour the egg mixture into the middle. Stir together to completely combine.
4. Toss chopped walnuts with remaining 1 teaspoon flour to coat. Fold into batter.
5. Pour batter into prepared muffin pan. Bake for 25-30 minutes.



You can use any flour or gluten-free flour alternative, including cassava flour, for these muffins, although follow package directions for conversions, if necessary. You can make these more nutrient dense with maple sugar or brown sugar instead of white sugar.

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.



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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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Kiersten is a Content Creator for Nutrivore with a focus on recipe creation, practical resources and food photography, with a little writing on the side. After experiencing full body healing with the help of Dr. Sarah's and others' work, she now enjoys finding and creating beauty both in her work for Nutrivore and in her home as she raises two daughters alongside her military husband.



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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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