



THE MIGHTY ANTIOXIDANT

How eating the right superfoods can strengthen your immune system and bolster your defenses against colds, flu and even diseases.

BY HOLLY PEVZNER

Antioxidants are like immunity superheroes. We all know that they're here to do good, to battle unknown villains in our bodies, to bolster our health and to help stave off illness. But like myriad masked and caped crusaders in comic books, antioxidants and their disease-battling ways are shrouded in mystery. What exactly are antioxidants, anyway? Are they just amped-up vitamins? And do they really keep colds, flu and even colossal villains like diabetes and cancer at bay? It's a riddle worth solving. "Antioxidants are critical for all aspects of our health," says Susan Blum, M.D., an assistant clinical professor of preventive medicine at the Icahn School of Medicine at Mount Sinai and the author of *The Immune System Recovery Plan*. "Without adequate nutrients, including antioxidants, the

immune system simply won't function properly." Essentially, antioxidants are the kryptonite that the immune system needs to quash the bad guys.

The Dynamic Duo

The immune system is in charge of defending us against sickness and disease, but it can't do it alone. First, we've got our immune cells hiding in various hubs throughout the body, like inside the lymph nodes on either side of the neck. When healthy, those immune cells lie in wait, ready to ward off any enemies. "When an invader, like a virus, bacteria or toxin, comes in, those immune cells start to battle it out," says Blum. (All the clashing, if you will, is why glands swell when we've got a sore throat.) But those immune cells don't amount to much without antioxidants.

More or less, an antioxidant is a chemical

property that's ready to prevent, fight and repair immune-cell damage caused during battle. (Antioxidants are a class of substances, so they can be a vitamin, a mineral or something else.) "If our immune cells don't have enough antioxidants, they won't be able to recover," says Desiree Nielsen, R.D., the author of *Eat More Plants*. "We'll be at an increased susceptibility to infection, wound healing will take longer, and your energy levels will decrease." Low levels of antioxidants can even directly diminish one's ability to bounce back after health events, such as an infection, a fall or surgery, according to a 2019 study of folks 50 and older in the *Journal of the American Medical Directors Association*.

Battling Oxidative Stress

Antioxidants not only prevent, fight and repair cell damage, they also act as cells' main custodians. Every day, our bodies crank out about 4 million free radicals. "You, me, the healthiest people, everyone makes free radicals," says Blum. This is a natural, normal part of converting food to energy (aka the metabolic process). In the simplest terms, free radicals are waste products of our metabolism, and antioxidants are the sponges, mopping

up the mess. "Every day, we make free radicals and clean them up, make free radicals and clean them up, and so on. We're built to be able to properly maintain the balance between antioxidants and free radicals," says Blum. But for the majority of us who fall short on the antioxidant front, the cleanup can't keep up with the mess. And that imbalance can cause big trouble.

"Free radicals contain an unpaired electron, and electrons don't like to be single. They become unstable," says Nielsen. When not naturally cleaned up by antioxidants, these toxic bachelors, so to speak, can go on to cause a whole lot of damage looking for a mate, throwing elbows at cells, tissue, enzymes and DNA. "When the damage, called oxidative stress, keeps occurring, our immune system attempts to repair it, which can lead

to a chronic inflammatory response," explains Nielsen. It's a disease domino effect: a shortage of antioxidants leads to an abundance of free radicals, which leads to oxidative stress, which then leads to inflammation and a dysregulated immune system. A 2011 study in the journal *Food and Bioprocess Processing* noted that our vast lack of antioxidants expedites the development of cancer and other big-hitter diseases, including cardiovascular, neurodegenerative, inflammatory and Alzheimer's diseases. Of course, boosting antioxidant intake won't eliminate all or any of these conditions altogether, but it would certainly help drive them back and ease their severity.

The Power of Protection

A 2018 report in the *Journal of Nutrition & Food Sciences* clearly states that consuming an antioxidant-rich diet directly impacts longevity by way of maintaining the health of your heart, brain, lungs and other organs. More specifically, another 2018 study, this one in the *American Journal of Clinical Nutrition*, found that a high dietary intake of antioxidants, including vitamin C and carotenoids, was associated with a reduced risk of cardiovascular disease, total cancer and all-cause mortality. (Dietary, by the way, means via food, not supplements.) Antioxidants even have an impact on ALS (aka Lou Gehrig's disease), a devastating neurodegenerative disorder. Research in *JAMA Neurology* found that consuming fruits and vegetables that are high in antioxidants can slow the progression of the disease.

Then there's the extensive research on antioxidants and diabetes. The latest: women who consume the most antioxidants had a 27% lower risk of type 2 diabetes than those who ate the least, according to a 2018 study in the journal *Diabetologia*. That held true regardless of other risk factors, such as smoking, cholesterol levels and BMI. And that's why folks at Geisinger Health System in Pennsylvania started the Fresh Food Farmacy, where patients with type 2 diabetes receive free healthy, antioxidant-rich groceries every week, not meds. "We know that antioxidants help prevent or slow damage to the cells in our body, and that's why we give our patients up to 10 different fruits and vegetables each week

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SHOW OFF THE RAINBOW OF NUTRIENT-DENSE VEGETABLES AND THEN SLOW-ROAST THEM IN THE OVEN UNTIL THEY START TO BROWN ON TOP.



to help reduce their risk for chronic diseases,” notes Allison Hess, the vice president of health for Geisinger Steele Institute for Health Innovation. And it’s working: data from 200 patients showed that proper nutrition, paired with support and education, garnered an average 2-point drop in levels of HbA1c, which is a marker for determining how well diabetes is controlled. (On average, common diabetes meds help lower a patient’s HbA1c by just 0.5 to 1 point.) If all of this health help is in our reach, why aren’t we taking advantage?

Why We’re Falling Short

“The amount of antioxidants you need at any given time can shift,” says Blum. “It’s all about the net.” Just as with dollars, the net of antioxidants is what’s left after all deductions have been made. Exposure to chemicals, mold or cigarette smoke? Deduction. Got a cold? Deduction. Dealing with a chronic infection or illness? Deduction, deduction. Gut issues are a big problem too. “People who have an overgrowth of bacteria, an imbalance of microbes in the gut or other gastrointestinal problems often experience malabsorption of nutrients, including antioxidants,” says Blum. This means that you very well might be eating like you think you should but not reaping all the benefits.

“Taking certain medications, such as acid blockers, and simply aging can also interfere with the absorption of antioxidants,” says Elizabeth W. Boham, M.D., R.D., a functional and integrative medicine specialist and the medical director of the Ultra-Wellness Center in Lenox, Massachusetts. “People in their 70s or even younger naturally don’t absorb and utilize as many antioxidants as they used to—and this comes at a time when their nutrient requirements actually increase.”

Our immune health suffers not just by what we eat, but also by what we don’t eat. “It’s actually two separate but connected issues,” says Boham. First, the typical American eats too many processed, low-fiber, refined foods, which is taxing on the system. “It causes things like blood sugar to spike and inflammation. And that triggers oxidative stress,” says Boham. (Remember, oxidative stress is an imbalance between free radicals and antioxidants. And over time this can interfere with how well our cells and tissues function.) Oxidative stress is

mitigated with an antioxidant-rich diet. And that’s our second—and perhaps most pressing—issue: “We are severely lacking in our consumption of fresh whole foods, which are our best source of antioxidants—not supplements,” says Nielsen.

However, supplements are what many people rely on to get their (paltry) fix: a 2011 survey in the *British Journal of Nutrition* found that dietary supplements are the second main source of antioxidants in the U.S. “While I’ve definitely advised some patients to take a supplement that contains a specific antioxidant, we need to understand that when you isolate an antioxidant in pill form, you miss out on all of the other benefits of the food,” says Boham. “There are so many things in our plant food that we don’t know or even appreciate, yet all of which could play a role in our immune health.” Plus, increasing the intake of antioxidant-rich superfoods such as fruits and vegetables—not antioxidant supplements—is what tamps down one’s risk of chronic disease, finds the *American Journal of Clinical Nutrition* study mentioned earlier.

Defend with Superfoods

While there is no recommended daily allowance for antioxidants, many experts, including Boham, believe that for most healthy adults, eating a balanced diet packed with a variety of antioxidant-rich plant foods, like fruits, vegetables, nuts, seeds and herbs, would be enough to counter most free-radical damage. Boham suggests 8 to 13 servings of these superfood plants a day to get to optimal. (A serving, for example, could be a cup of green tea, a teaspoon of basil or ½ cup of cooked spinach.) If that seems overwhelming, simply follow Nielsen’s lead of making sure that half your plate is covered in plants, like fruits and vegetables. “I don’t mean meal to meal. I mean plate to plate, so every time you eat,” she says.

And, yes, among the plant masses there are some antioxidant standouts. “All kinds of berries, leafy greens and cruciferous vegetables are

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STONE FRUITS ARE FILLED WITH VITAMIN C AND HEALTHY PHYTOCHEMICALS.

antioxidant-rich and often considered superfoods,” says Nielsen. This is not only because they contain great quantities of antioxidants, but also because there’s been so much research on these specific foods to better understand their impact on health. “All of these foods are great places to start when trying to get more antioxidants into your everyday,” says Boham. So go ahead and pile on the blueberries. Eat more spinach. (A 2011 report in the *European Journal of Nutrition* found that even a moderate consumption of 1 cup of spinach a day protected against damage caused by oxidative stress.) Add broccoli, Brussels sprouts and kale into the fold. (The American Institute for Cancer Research notes that cruciferous veggies may limit the production of cancer-related hormones and prevent tumor growth.) But don’t stop there.

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When experts tout variety, they mean it: seek out different foods in different colors to fill your grocery cart week to week or season to season. (Love orange carrots? Try purple next week.) A food’s pigment is one of the easiest ways to discern at least some of its antioxidant properties. For instance, red and blue plants like beets and berries show that your food is rich in anthocyanin, an antioxidant that’s been proven to lower LDL cholesterol levels and blood pressure and therefore reduce one’s risk for heart disease. The oranges and yellows of carrots, sweet potatoes, bell peppers and more signal that carotene is onboard. Research shows that consuming plenty of carotene-rich fruits and vegetables may significantly reduce the risk of some chronic diseases, including cancer and cardiovascular disease, as well as eye-related conditions.

“Eating a variety of plants not only ensures you’ll obtain different antioxidants, it ensures that you’ve got the full arsenal working for you,” says Nielsen, who notes that nuts and seeds always seem to fall off the antioxidant go-to list. “Just ¼ cup daily would be impactful,” she says. Another antioxidant oversight, perhaps to do with their less-than-rainbow-like appearance: garlic, onions and

mushrooms. “They help the body make glutathione, which is one of the strongest antioxidants we have,” says Boham.

Take It to the Next Level

There are subtle ways you can go about pumping up your antioxidant intake. First is the add-in strategy. If you’re already making a salad or roasting broccoli or seasoning your dinner, simply incorporate another antioxidant-packed superfood element. Sprinkle in nuts, roast garlic too, and toss a handful of thyme into your already simmering stew. Another add-in: healthy fats. “Always have a source of healthy fat at a meal, such as extra-virgin olive oil, nut butters or avocado,” says Nielsen. “Many antioxidants are fat-soluble, meaning you need the fat to better absorb the antioxidant.” You can also make swaps. Trade your second cup of coffee for another antioxidant-rich caffeinated beverage: tea. “Green tea especially,” says Nielsen. “Tannins, a type of antioxidant in tea, are superb at fighting inflammation and combating oxidative damage.”

Finally, eat both cooked and raw foods. “Some antioxidants, such as vitamin C, are best preserved in fresh form, while others, like lycopene, are best absorbed when cooked,” says Nielsen. And since foods like tomatoes contain both, changing it up is always best. When you are cooking, it’s best to shoot for a “tender-crisp” consistency to get the max amount of antioxidants. (Bonus: Quickly zapping veggies in the microwave is a great way to hold on to a lot of antioxidants too.)

WILL UPPING YOUR ANTIOXIDANT INTAKE TODAY turn your immune system around tomorrow? No. But it will get there over time. “All of these chronic conditions that tax our immune system take time to accumulate,” says Nielsen. “Diabetes, heart disease, psoriasis—none of this happens overnight.” It’s all a slow build of many factors, including our lack of antioxidant-packed superfoods. “We need to let antioxidants do their job and counter the damage that’s occurring every single day,” she says. Essentially we need to be our own superheroes. “If we all started consuming more whole foods, packed with antioxidants, we’d experience an enormous positive impact in terms of health and disease prevention,” says Boham. “It’s in our reach.” ●



IMMUNITY-BOOSTING FOODS & NUTRIENTS

If the much-dreaded cold and flu season is upon you, here’s how you can bolster your defenses against the germs lurking in the common areas in your office, the mall where you do your holiday shopping and the rest stops you encounter in your holiday travels. Include these immunity boosters in your diet, plus make sure to wash your hands and try to get enough sleep too.

BY EMILY SOHN

GREEN TEA

Polyphenols, potent plant antioxidants, are what’s believed to give green tea its immune-boosting effects. One laboratory study suggested that a particular type of polyphenols called catechins may kill influenza viruses. To maximize benefits and minimize bitterness, use just-below-boiling water and steep green tea no more than a minute or two. A little lemon and honey can also help blunt the bitterness. But don’t add milk, since the proteins will bind to the polyphenols, making them less able to be absorbed.

CHICKEN SOUP

It turns out there is something to chicken soup after all. Although soup won’t stop you from getting a cold, it could help ease symptoms faster. One study found that eating chicken soup has a mild anti-inflammatory effect that impacts white blood cells to relieve cold symptoms more quickly, as well as helps keep colds from developing into upper respiratory infections.

VITAMIN D

In a study published recently in the *American Journal of Clinical Nutrition*, children who

took daily vitamin D supplements (1,200 IU) were 40% less likely to get a common flu virus than kids who took a placebo. Laboratory studies indicate that the nutrient may help immune cells identify and destroy bacteria and viruses that make us sick, says Adit Ginde, M.D., M.P.H., a public-health researcher at the University of Colorado School of Medicine in Denver. Since the majority of Americans don’t get enough vitamin D, some experts recommend a D supplement. You can also get it (in small doses) from fatty fish, such as salmon, and fortified milk—and your body makes vitamin D from the sun.

SOLUBLE FIBER

Mice that ate a diet rich in soluble fiber for six weeks recovered from a bacterial infection in half the time it took mice that chomped on meals containing mixed fiber, according to a recent study in the journal *Brain, Behavior and Immunity*. Soluble fiber, which is abundant in citrus fruits, apples, carrots, beans and oats, helps fight inflammation, says lead author Christina Sherry, Ph.D., R.D., of the University of Michigan, Ann Arbor. Insoluble fiber—found in wheat, whole grains, nuts and green leafy vegetables—is still important for overall health, but it doesn’t seem to have the same impact on immunity. Strive for 25 to 38 grams of total fiber a day, Sherry says, paying extra attention to getting the soluble kind.