

eat smart

FOOD TKO

In your fight to slow aging and maintain health, plant-based phytochemicals just may offer the knock out punch you need. Phyto what? Read on...

BY MATTHEW KADEY, MSC, RD



Remember when it was easy? There were carbohydrates, protein and fat. Tagging along was an assortment of vitamins and minerals. These were the crux of good, sound nutrition. Take in a proper balance of each, and a girl could expect to be gloriously slender and perfectly healthy. Now, thanks to curious food scientists, we have been tossed a nutritional curveball. Apparently, healthy eating these days also includes a hefty intake of tongue-twisting compounds dubbed phytochemicals. There are hundreds (perhaps thousands) of them including sulforaphane, lutein, lycopene and anthocyanins.

You could hardly be blamed for wishing you hadn't skipped out on those biochemistry classes. Thing is, scientists promise that if we nosh on more foods with these guys in them we can do everything from delaying aging, preventing heart disease and staving off cancer. I'm sold and you should be too. We've combed through the latest research to give you the skinny on phytochemicals and which ones should be for dinner tonight.

PLANT ARMOR

So what exactly are these newfangled chemicals? According to Georgianna Donadio, PhD, program director for the National Institute of Whole Health in Boston, MA, phytochemicals are compounds produced by living plants to protect themselves as they grow. Just as we need that wool scarf on a biting winter morning, Donadio says plants need certain chemicals to fend off environmental stressors like pesky insects. "What's exciting is that many of these plant survival chemicals are still active when we consume them," says Donadio. At which point, prevailing Harvard research says that they benefit us, or you might say "become our survival compounds."

BATTLE PLAN

The number of tactics phytochemicals employ to keep us out of the doctor's office seems to be growing faster than Oprah's bank account. Here are some of the standouts.

RADICAL BEHAVIOR: "Many phytochemicals have antioxidant properties that protect us against pro-oxidant free radicals," says Marian Neuhouser, PhD, RD, a nutritional epidemiologist at Seattle's Fred Hutchison Cancer Research Center. Oxidation of our cells by free radicals, which emerge from a variety of avenues such as pollution, normal metabolism, and even exercise can, over time, expedite disease and aging.

BACTERIAL FOE: Harmful bacteria flourishing in our bodies is never good news. Thankfully, there are phytochemicals to keep the numbers of these unwelcome guests in check.

HORMONE JOCKEY: "Some plant compounds, like those in soy, may alter how hormones such as estrogen participate in disease risk," explains Neuhouser.

ENZYME REVIVAL: Various phytochemicals have the uncanny ability to induce enzyme functioning in an anti-disease manner. Basically, they give enzymes a kick in the fanny to get going and keep us healthy.

SACK INFLATION: Uncontrolled cell expansion is the basis behind cancer. "A few phytochemicals like those in cruciferous vegetables work at the cellular level to halt this multiplication and even participate in the programmed death of cells that could become cancerous," Neuhouser points out.

COLOR YOUR LIFE

While there are assorted phytochemicals to which we could devote an entire issue, these eight are particularly worth sinking your teeth into.

Lutein

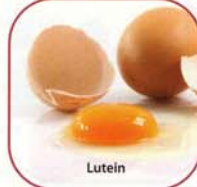
BIG IMPACT: "Lutein and its sidekick zeaxanthin are concentrated in the retina of the eye where they may limit damage caused by light-induced oxidation and aging,"



Anthocyanins



Lycopene



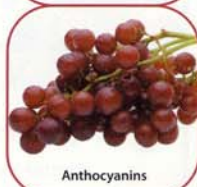
Lutein



Sulforaphane



Allicin



Anthocyanins



Curcumin



Resveratrol

explains Neuhouser. So, boosting your intake may keep your peepers in tip-top shape by warding off cataracts and macular degeneration – the leading cause of blindness in North America.

FOUND IN: Egg yolk, spinach, kale, broccoli, corn, Brussels sprouts, collard greens

MAKE IT BETTER: Being fat-soluble, lutein cannot be absorbed properly unless dietary fat is also present. To get the most bang for your phytochemical buck, serve salads with a healthy fat source such as olive oil, avocado or nuts.



Anthocyanins

BIG IMPACT: "A number of studies suggest increased intake of anthocyanins can fight heart disease, reduce inflammation and generally help prevent or slow a number of degenerative processes related to aging," says Brent Bauer, MD, director of the Complementary and Integrative Medicine Program at the Mayo Clinic. Anthocyanins in blueberries are thought to be the reason why this diminutive fruit can boost memory while those in cranberries keep irksome urinary tract infections at bay.

FOUND IN: Berries, grapes, red wine, beets, plums, red radishes

MAKE IT BETTER: With more anthocyanins per pound, smaller wild blueberries pack a bigger antioxidant (and flavor) punch than plumper cultivated versions. Fresh wild blueberries are available during the summer months, but you can find them year-round in the freezer section at most supermarkets.



Sulforaphane

BIG IMPACT: It turns out mom was right – you'd be smart to gobble up all your broccoli. Sulforaphane, abundant in cruciferous vegetables, activates what are called phase two enzymes, which then seek out and destroy cancerous cells. Neuhouser adds that sulforaphane may help keep steroid hormones such as estrogen and testosterone at normal levels. "A function that might reduce hormone-related diseases like breast cancer," says Dr. Bauer.

Pill or Apple?

As lutein's and lycopene's rock star status keeps on surging, more people are complimenting their morning eggs and oats with a hit of these and other phytochemicals in pill form. But, before you raid the shelves of your local GNC, Marian Neuhouser, PhD, RD, points out that whole foods have the variety of compounds needed to fight disease that can't be replicated in supplements. "There are likely many compounds in fruits and vegetables not yet identified, so if you're taking just a few individually that are known to science, you could be missing the boat." In fact, a 2006 *Journal of Nutrition* study reported that smaller amounts of many different phytochemicals decreased cell damage more than a diet that had larger amounts of fewer chemicals. What's more, studies show that some phytochemicals such as ellagic acid (found in raspberries) and quercetin (present in apples) work together synergistically to bring about a greater disease-fighting effect than if they went at it alone. Think of it as food synergy or two-heads-are-better-than-one.



Go Wild!

With wild blueberries hogging the number-one spot in antioxidant activity among more than 20 fruits, it's no wonder these precious berries are flying off market shelves. When shopping for blueberries, make sure you choose "wild." They pack a much more potent antioxidant punch and are much larger than their cultivated cousins. Researchers have found that wild blueberries may reduce the risk of Alzheimer's; other benefits include its anticarcinogenic properties, as well as promoting brain, heart, urinary tract and vision health. Visit the Wild Blueberry Association of North America (WBANA) website to find out where to buy wild blueberries near you: wildblueberries.com.

FOUND IN: Broccoli, cauliflower, bok choy, Brussels sprouts, cabbage, kale



MAKE IT BETTER:

Broccoli sprouts – the tiny, green threads sold next to alfalfa sprouts – have higher levels of glucoraphanin (which turns into sulforaphane during chewing) than what's in mature broccoli.

Curcumin

BIG IMPACT: Curcumin's ability to reduce inflammation may make it effective at lessening symptoms associated with arthritis, reducing Alzheimer's risk and promoting post-exercise recovery. Numerous studies show that this phytochemical may have the ability to thwart cancer and also slow the progression of multiple sclerosis.

FOUND IN: Turmeric, curry powder



MAKE IT BETTER: Next time you are rustling up a pot of rice, quinoa or other grains, add a splash of color and toss in a teaspoon of turmeric.

Lycopene

BIG IMPACT: As a very potent antioxidant, lycopene seems to be an ally in the battle against several cancers, including those of the breast, lung and stomach. In a recent study, Israeli researchers found that subjects who consumed tomato-rich diets had higher levels of HDL cholesterol – the type of cholesterol that is heart-protective.

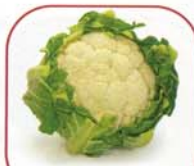
FOUND IN: Tomatoes, red peppers, pink grapefruit, guava, watermelon, apricots, papaya



MAKE IT BETTER: Cozy up to your Italian eatery. Lycopene is more concentrated in processed tomato products like pasta sauce, tomato paste and tomato juice.

Resveratrol

BIG IMPACT: As an antioxidant and anti-inflammatory, says Dr. Bauer, resveratrol has



Sulforaphane



Lycopene



Resveratrol



EGCG



Lycopene



Resveratrol



Allicin



EGCG

great promise as a protective agent against cardiovascular disease. However, clinical trials are still needed to prove its role definitively. Some researchers believe this phytochemical plays a significant role in why wine-loving Mediterraneans have such strong hearts.

FOUND IN: Red wine, red/purple grapes, peanuts, berries



MAKE IT BETTER: Natural peanut spreads have more resveratrol than brands with sugar and trans fats mixed in. High intakes of alcohol come with an elevated risk for breast cancer, so cap your wine intake to about five ounces per day.

Allicin

BIG IMPACT: Studies have confirmed that allicin can inhibit the growth of *Helicobacter pylori* – a bacteria responsible for the development of stomach ulcers and cancer.



FOUND IN: Garlic, onions, shallots, scallions, leeks, chives

MAKE IT BETTER: Sharpen that Wüsthof cutlery. Chopping garlic releases an enzyme called allinase, which then reacts with the amino acid alliin to form allicin. But add your white bits at the end of cooking as heat reduces allicin's potency.

Epigallocatechin-3-gallate (EGCG)

BIG IMPACT: E-pee-gaa...oh, forget it. Just know this: This multi-talented compound is thought to protect against cancer and heart disease, brew up healthier skin, build bone, ramp up brain function, take blood sugar down a notch, rev up metabolism and perhaps improve exercise endurance. Maybe even help you survive nuclear winter.



FOUND IN: Green tea

MAKE IT BETTER: One study published in the *Journal of Nutrition* suggests that consuming black pepper when drinking green tea can increase the amount of EGCG absorbed. When enjoying a cup of green goodness with a meal, be sure to spice up your chow with freshly ground black pepper.

Best Defense

Reams of studies prove that, largely due to the presence of heaps of antioxidants including vitamin C, beta-carotene and assorted phytochemicals, becoming good friends with the salad bowl and nibbling on berries instead of chocolate-covered almonds can keep you slim and disease-free. Thanks to researchers with the U.S.

Department of Agriculture, we now know these plant-based foods pack the biggest antioxidant wallop. By adding together the total amount of lipid-soluble and water-soluble antioxidant chemicals in each comestible, the scientists were able to determine the Total Antioxidant Capacity (TAC).

Foods That Measure Up

FOOD	TAC	SERVING
Blueberries (wild)	13,427	per cup
Red Kidney Beans (dry, mature)	13,259	per ½ cup
Pinto Beans (dry, mature)	11,864	per ½ cup
Blueberries (cultivated)	9,019	per cup
Cranberries	8,983	per cup (whole)
Artichoke	7,904	per cup (hearts)
Blackberries	7,701	per cup
Dried Prunes	7,291	per ½ cup
Raspberries	6,058	per cup
Strawberries	5,938	per cup
Red Delicious Apples (with skin)	5,900	per apple
Pecans	5,095	per ounce
Russet Potatoes	4,882	per potato
Black Plums	4,844	per plum
Cherries	4,873	per cup
Black Beans (dry, mature)	4,181	per ½ cup
Walnuts	3,864	per ounce
Dried Dates	3,467	per ½ cup
Ground Cloves	3,144	per gram
Hazelnuts	2,739	per ounce
Cinnamon	2,675	per gram
Broccoli Raab	2,621	per 85 grams
Dried Figs	2,537	per ½ cup
Red Cabbage (cooked)	2,359	per ½ cup
Pistachios	2,267	per ounce
Oregano Leaf (dried)	2,001	per gram

EAT UP

The good news is that cell-protective phytochemicals are abundant in a variety of plant-based foods. The bad news is the Flintstone-sized slice of cake you devoured the other night watching *Lost* is, sigh, devoid of them. Here's the scoop on making sure your diet is chemical intensive.

PASS THE BROCCOLI, HOLD THE FRIES: Because these good-for-you compounds are naturally present in the denizens of your crisper, take the advice of Marian Neuhouser, a nutritional epidemiologist: Aim for at least nine servings of fruits and veggies per day. (Read: More time in the produce section, less in the cookie aisle.) Whole grains, beans, nuts, dark chocolate and tea also contain phytochemicals, which are guardians of health.

RAW POWER: Because exposure to prolonged heat can lay waste to several phytochemicals, it's best to consume some produce that has not been boiled or nuked to death. "Non-intensive cooking methods such as steaming and light sautéing can prevent much of the loss of these nutrients," says Georgianna Donadio, PhD. Consider dusting off that steamer: Donadio goes on to add that such low impact cooking methods can actually turn a few phytochemicals, including beta-carotene (found in carrots, squash and other orange produce) and lycopene into more easily absorbed forms. The upshot: Enjoy a good mixture of cooked and *au naturel* produce.

GO ORGANIC: Sure organic bell peppers will make your wallet lighter, but, according to Donadio, they have enhanced disease-fighting potential. "Organically grown produce will deliver more protective phytochemicals, because without the assistance of pesticides and herbicides, they encounter more environmental stresses."

HURTS SO GOOD: Spices and herbs not only add a punch to your meals but many like turmeric, oregano, cayenne and cinnamon are loaded with phytochemicals. Ergo: Fill up the spice rack and get shaking.

ALL DRIED UP: Take your hand out of the cookie jar and nibble instead on dried fruits like dates, apricots, prunes and mango. Absent the water, these sweet treats are particularly concentrated in good-for-you chemicals. But remember to look for varieties that don't contain any added sugar – these shriveled treats are naturally sugary enough as it is.

TURN OVER A NEW, GREENER LEAF: You can thank phytochemicals for the kaleidoscope of hues in fruits and veggies. It's the anthocyanins that give blueberries their brilliant blue hue, while lycopene keeps tomatoes flushed. "The best way to expose yourself to a variety of phytochemicals is to choose plenty of different deeply colored produce," advises Neuhouser. Orange cauliflower anyone? ☺



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