

Antioxidants: Is the hype justified?

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Twenty-five years ago the term "antioxidant" was new to the public. Today it's big business, with sales of products making antioxidant-related claims reaching \$65 billion in the U.S. in 2011.

You'll find antioxidant claims made not just for dietary supplements, but also for everything from juice, cereal, and power bars to tea, chocolate, and even [bottled water](#). "Antioxidant"—a substance that helps mop up cell-damaging free radicals—has become synonymous with overall good

health and [disease prevention](#).

A more recent trend is for companies to advertise specific antioxidant levels or "scores," or to compare their products to others in antioxidant power. For instance, new cereals from Silver Palate boast 7,300 ORAC units per 100 grams, while Mystic Harvest Purple Corn Tortilla Chips list 6,000 ORAC units (ORAC, which stands for oxygen radical absorbance capacity, is one of several measures of antioxidant status developed by scientists). A baobab fruit powder that you add to oatmeal, yogurt, or other foods lists an ORAC value of 1,400 per gram. And tea extracts from Green Cell Technologies claim to have ORAC scores of up to 1.7 million per 100 grams.

It's hard to say what all those numbers mean. But they probably don't mean a whole lot in terms of health. The science and significance of antioxidants is much more complicated than a single number on a package can convey. The FDA has issued warnings against Lipton and other companies for making misleading and illegal claims about antioxidants—but many other iffy ones slip through the cracks.

Alphabet soup

Despite all the label claims, there's no standardized method for measuring antioxidant status and no official definitions for antioxidant capacity, ability, activity, power, efficiency, or other words you might see on packages or websites. Rather, scientists have developed a variety of tests, all with four-letter acronyms—besides ORAC, there are TEAC, TOSC, FRAP, TRAP, and others. These don't necessarily measure the same things or provide consistent results. For instance, a 2009 study in *Food Chemistry* noted that TEAC, which is simpler and cheaper, underestimates the antioxidant capacity of some foods, compared to ORAC.

Even different labs using the same test can come up with different results. Some companies specify ORAC values, but others don't even say how they came up with their values.

Moreover, ORAC and other tests measure antioxidant capacity of substances only in test tubes. How well the antioxidants suppress oxidation and protect against [free radicals](#) in people is pretty much anyone's guess. A lot can happen to antioxidants once a food is digested and metabolized in the body, and little is known about their interactions. What has high antioxidant activity in a test tube may end up having little or no effect in the body. Preliminary research has found that when people eat high-ORAC foods, their blood [antioxidant levels](#) rise, but such results still don't prove that this translates into actual health benefits.

The Canadian Food Inspection Agency notes on its website that "statements or claims about ORAC are not acceptable on foods because the relationship between ORAC scores and health effects in humans has not been established."

Citing similar concerns, the USDA recently removed its ORAC database from its website and says that "ORAC values are routinely misused by food and dietary supplement manufacturing companies to promote their products." Some experts think the term should be banned on food and beverage labels altogether.

More reasons to ignore anti-oxidant claims

- There's no reference to know what antioxidant numbers mean. Are 3,700 ORAC units, for instance, a lot or a little? Is something claiming to have 2,900 units significantly better than one with 2,400 units? Who knows?

- Products that don't make antioxidant claims may be just as high in antioxidants as those that do. A 2012 paper from Portugal that looked at antioxidant activity of teas, fruit juices, and [dietary supplements](#) noted that some juices had similar values, regardless of their labels.
- Often, claims are based only on the levels of antioxidant vitamins in a product—and in some cases, those vitamins may have been added to pump up the claims. For example, Tropicana Antioxidant Advantage orange juice simply contains an extra 90 milligrams of vitamin C and an extra 30 IU of vitamin E per cup.
- Claims comparing the antioxidant level of a food or beverage to another product can be misleading if they are based on weight, because serving sizes of foods differ. For instance, Silver Palate [cereals](#) boast on the labels that they contain more antioxidants, ounce for ounce, than blueberries—but while a typical serving of the cereal is just one ounce, a serving of blueberries is 3 to 5 ounces. Thus, you actually get more antioxidants by eating a serving of blueberries.
- It's also misleading when companies compare their products based on one specific antioxidant. For example, [Lipton](#) Tea has a chart on its boxes showing that it has 105 milligrams of flavonoids per 8-ounce serving, compared to only 33 milligrams in orange juice. But that's like comparing apples (or in this case, tea) and oranges, since the two contain different types of antioxidants. Tea is rich in flavonoids, while orange juice contains lots of vitamin C, plus a whole range of nutrients that tea lacks.

Bottom line: Don't let antioxidant claims on foods sway your buying decision. Foods without such claims may be just as healthful or even more so. You certainly don't need antioxidant supplements, and too much of some kinds may be harmful. Still, a diet that is naturally rich in a mix of antioxidants is something to aim for. Just focus on whole foods,

notably fruits and vegetables that have a variety of colors—from red, orange, and yellow to blue and green. Even some white fruits and vegetables are rich in antioxidants, as are whole grains, nuts, and legumes. Filling half your plate with fruits and vegetables and one-quarter with whole grains, as the U.S. Dietary Guidelines recommend, will give you plenty of [antioxidants](#).

Provided by University of California - Berkeley

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