

[IMAGE]

Eat Your Antioxidants

Key Dietary Factors and Supplements to Help Prevent Disease

By David Seaman, MS, DC, DACBN

The Danger of Free Radicals

Free radicals are molecules that can damage numerous components of the body, including genetic material (DNA), various proteins such as enzymes, important cell membrane fats, and cholesterol. Such damage is a factor in the promotion of most chronic diseases, most notably cancer and heart disease.

Free radicals are typically associated with oxygen molecules - consider how oxygen can rust or "oxidize" metal. In the body, free radicals oxidize DNA, proteins, cell membranes, and cholesterol. Many normal metabolic reactions produce free radicals, such energy production, inflammation, and immune reactions.

Fortunately, we have a built-in system for reducing free radicals; however, this antioxidant system is dependent on the continuous delivery of key nutrients from healthy foods, such as vegetables and fruits. As you probably know by now, the average modern person does not eat adequate amounts of vegetables and fruits, which places them at risk for developing chronic diseases attributable to free-radical production.

Excess Calories & Poor Diet Help Create Free Radicals

Molecules - Copyright © Stock Photo / Register Mark Many believe that the negative health impact of poor food choices take years to develop. We now know this to be false, and this is especially evident in the context of free-radical generation. Research has demonstrated that an important and quite underappreciated promoter of free-radical production is the overconsumption of calories, particularly sugar- and fat-rich meals in the form of desserts, snacks and fast foods. Researchers recently made the following statement in an article published in the *Journal of the American College of Cardiology*:

"The highly processed, calorie-dense, nutrient-depleted diet favored in the current American culture frequently leads to exaggerated supraphysiological post-prandial spikes in blood glucose and lipids. This state, called post-prandial dysmetabolism, induces immediate oxidant stress, which increases in direct

proportion to the increases in glucose and triglycerides after a meal."

Weeding through the scientific jargon, this means that when we do what I refer to as a drive-by, or drive-through, self-shooting at the fast food restaurant or similar establishments, the sugar and fat eaten in the meal leads to the *immediate* production of free radicals. This should lead us to consider the extremely unhealthy short-term consequences associated with overeating, which can only lead to disease and suffering if continued throughout a lifespan.

A Healthy Diet: Key to Free-Radical Reduction

The diet that immediately reduces post-meal free-radical production is one that contains vegetables and lean protein (meat, fish, chicken, wild game, etc. Fruit and nuts have similar antioxidant effects. We should embrace the fact that it is very difficult to consume excessive calories if fruits, vegetables, and lean proteins are our primary calorie sources. (*Note: It is possible to overconsume nut calorie, so moderation must be applied.*)

Research has demonstrated that we get additional antioxidant benefits from ethnic spices. Consider adding ginger, turmeric, garlic, rosemary, basil, oregano, dill, coriander, fennel, red chili pepper, cinnamon, allspice, nutmeg and other spices to your meals.

By the way, as might be expected, weight loss is a common outcome of anti-inflammatory or anti-free-radical eating. And as we now know, excess body fat is a promoter of inflammation and free-radical activity.

Supplements to Reduce Free Radicals

Regarding antioxidant supplements, undue emphasis has been placed on vitamins C and E, which are only two of the numerous nutrients that function in the human body's antioxidant network. Most B vitamins also play a role, as do magnesium and vitamin D. We get adequate amounts of B, C and E and most minerals in a multivitamin, so supplementing with these single nutrients is unnecessary.

It is also important to understand that after vitamins C and E reduce free radicals, these vitamins become free radicals that must be reduced by our body's antioxidant system, which is primarily dependent on the diet described above. (Not all antioxidants seem to become free radicals after neutralizing a free radical; some become less reactive after they do their job.) We can support the antioxidant system with key

supplements, some of which are not typically viewed as antioxidants, such as magnesium and vitamin D. While magnesium and vitamin D do not reduce free radicals directly, they do support the antioxidant enzyme systems in the body that function to reduce free radicals.

Magnesium: Two of magnesium's many functions in the body include supporting the efficient production of cellular energy and proper blood sugar regulation - both of which help reduce free-radical production by our cells. Approximately 400 mg of supplemental magnesium is the common recommendation. Conditions associated with low magnesium intake include headaches, accelerated atherosclerosis, cardiovascular disease, hypertension, stroke, renal tubular disorders, osteoporosis, diabetes mellitus, asthma, pre-eclampsia and eclampsia (conditions that may develop during pregnancy), and even sudden death.

Vitamin D: Recent research indicates that vitamin D supports key antioxidant enzymes, and vitamin D is known to be the key nutrient in maintaining proper immune balance, which leads to less free-radical and inflammatory damage. Without adequate vitamin D, we are at risk for numerous diseases including joint pain, muscle pain, osteoarthritis, osteoporosis, autoimmune diseases, cancer, depression, schizophrenia, syndrome X (also known as metabolic syndrome), diabetes, hypertension, asthma, and infections.

It is now very easy to determine your vitamin D levels via a simple blood test. Individuals with hypercalcemia (elevated levels of calcium in the blood) need to be wary of vitamin D supplementation. For all others, a supplemental level of 4,000 IU per day is a common recommendation.

Coenzyme Q₁₀: Unlike magnesium and vitamin D, coenzyme Q₁₀ (CoQ₁₀) acts directly as an antioxidant. It also enhances cellular energy production and positively influences healthy gene expression in skeletal muscle, making it the ideal antioxidant supplement. CoQ₁₀ has become somewhat famous recently because its synthesis in the body is known to be reduced by cholesterol-lowering statin drugs, and the many side effects of statins, such as fatigue and muscle pain, are thought to be related to reduced CoQ₁₀ production.

Coenzyme Q₁₀ is perhaps the most important antioxidant supplement because it regenerates vitamins C and E that we get from food and supplements. At least 100 mg per day is recommended to double blood levels, and we know that we cannot get this amount in food, making CoQ₁₀ a key antioxidant supplement.

Botanicals: As mentioned, most botanicals (herbs and spices) have anti-inflammatory and antioxidant functions. Three of the most commonly supplemented herbs are ginger, turmeric and garlic. Typical recommended amounts are 1 gram each of ginger and turmeric and 5 milligrams of allicin, which is the

active component of garlic.

In summary, if you desire to fight free radicals, a powerful combination includes the anti-inflammatory diet and supplementation with a multivitamin, vitamin D, magnesium, coenzyme Q₁₀, ginger, turmeric, and garlic. Talk to your doctor before making any major changes to your diet or beginning a supplement regimen, particularly if you are taking blood-thinning agents such as Coumadin or are on multiple medications.

Free Radicals: How They Cause Damage and What You Can Do About It

Molecules - Copyright â Stock Photo / Register Mark Free radicals are produced during normal metabolic reactions such as energy production and immune defense. In general, they are highly reactive, meaning they are likely to interact with other molecules/cells. Poor health behaviors such as improper diet, smoking, exposure to environmental pollutants, chemicals, etc., increase production of free radicals and uncouple the body's natural antioxidant system, leading to cellular and tissue damage. Over time, this cellular damage may accelerate the aging process and lead to numerous diseases. Antioxidants help neutralize free radicals, making them unlikely to interact with healthy molecules/cells and do damage.

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