A Radical Departure from Aging

by Patrick Dougherty

Your wrinkles show that you are aging. No wrinkles? Well, then the Botox treatment did wonders—but you're still aging inside. The Free Radical Theory of Aging, pioneered by Dr. Denham Harman in 1954, suggests that aging is linked to cellular damage caused by unstable atoms called "free radicals." Antioxidants, free radicals' natural enemies, are believed to neutralize free radical damage—and may help reverse aging in a far more significant manner than any superficial skin treatment could offer.

Warm, sunny days approach, and with them comes a bounty of antioxidant-rich summer fruits and vegetables that can help strengthen our natural anti-aging processes. By fighting aging with antioxidants, from the inside-out, we may not only gain a more youthful appearance, but also achieve vibrant inner vitality that is synonymous with good health.

Through a cartoon microscope, you might see free radicals as minuscule villains in little black hats, wreaking wanton destruction as they smash their way through the body. To understand this destruction, we must revisit high-school chemistry.

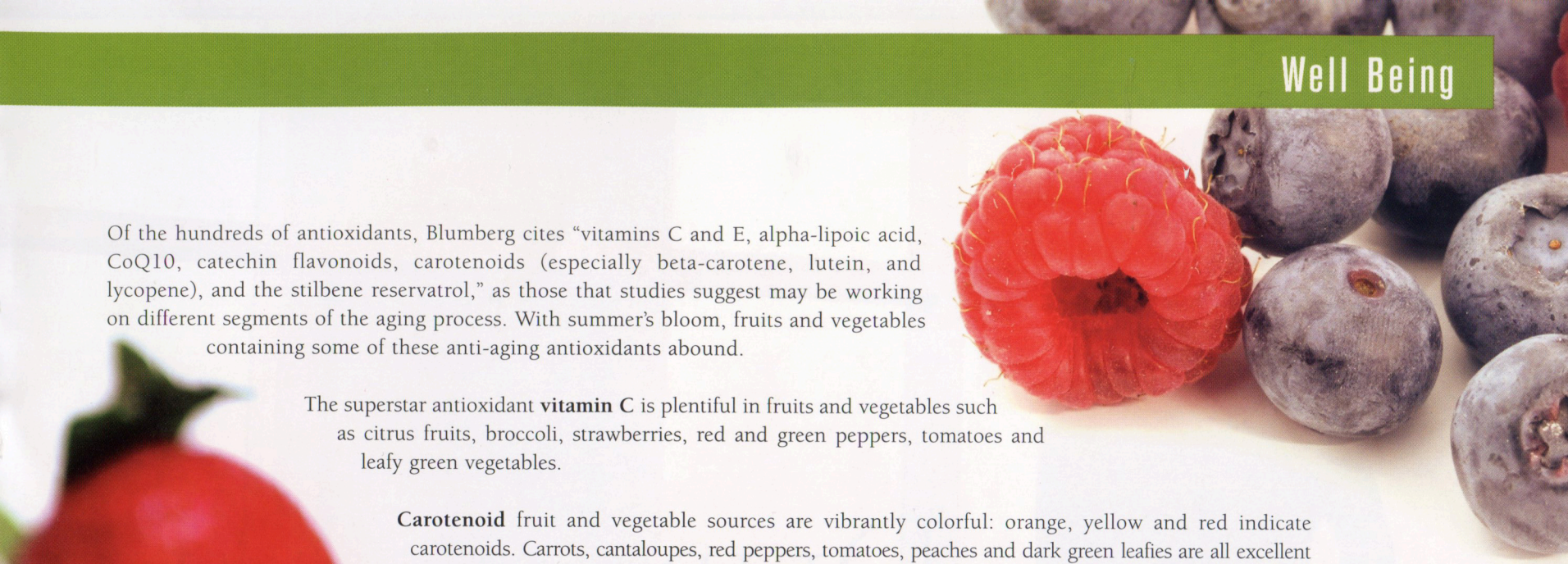
In nature, everything seeks balance. On an atomic level, this balance is achieved when electrons are paired. Free radicals are unbalanced, unstable atoms (or groups of atoms) that are one electron short of stability. Frantic free radicals smash against neighboring molecules and "steal" the electrons they need, achieving balance. The "victims" of this molecular hit-and-run, however, are now missing one electron—and become new free radicals. The entire process is called "oxidation."

Experts believe that this perpetual smashing of free radicals damages cell membranes and DNA, causing cells to mutate and even die. According to Harman's theory, this cellular damage hastens aging, thereby contributing to dozens of age-related diseases, including heart disease and cancer. On the surface, free radicals' dastardly work can be recognized in skin cell damage: wrinkles, sagging, and lost elasticity.

Unfortunately, free radicals are unavoidable natural byproducts of the oxygen "burning" that gives us energy. However, external factors that accelerate free radical damage can, to an extent, be controlled. Smoking, stress, pollution, ultraviolet rays, junk food and alcohol can all elevate levels of free radicals in the body. This lends credence to Harman's theory, since heavy smokers and dedicated sun worshippers seem to age faster and have higher incidences of certain age-related diseases.

But enough with the chemistry. Let's talk pie... apple pie. When you slice open an apple, it quickly turns brown. This is oxidation in action, similar to oxidation within the body. When making apple pies, chefs often toss sliced apples in lemon juice. Miraculously, these apple slices do not turn brown—because lemon juice contains vitamin C, a powerful antioxidant that blocks oxidation.

"Antioxidants share the property of 'quenching' or blocking the injurious effects of free radicals," explains Dr. Jeffrey Blumberg, Chief of Tufts University's Antioxidant Research Laboratory at Jean Mayer USDA Human Nutrition Research Center on Aging. Antioxidants are able to freely donate electrons to free radicals without becoming free radicals in the process.



Of the hundreds of antioxidants, Blumberg cites "vitamins C and E, alpha-lipoic acid, CoQ10, catechin flavonoids, carotenoids (especially beta-carotene, lutein, and lycopene), and the stilbene reservatrol," as those that studies suggest may be working on different segments of the aging process. With summer's bloom, fruits and vegetables containing some of these anti-aging antioxidants abound.

The superstar antioxidant **vitamin C** is plentiful in fruits and vegetables such as citrus fruits, broccoli, strawberries, red and green peppers, tomatoes and leafy green vegetables.

Carotenoid fruit and vegetable sources are vibrantly colorful: orange, yellow and red indicate carotenoids. Carrots, cantaloupes, red peppers, tomatoes, peaches and dark green leafies are all excellent sources of carotenoids. Kale, collard greens and spinach all contain high levels of the carotenoid antioxidant lutein, which, in addition to its fame as an eye protector, has recently been shown to protect skin from the sun's damaging rays.

Flavonoids are found in citrus fruits, berries (especially blueberries), beets, green leafies, broccoli and parsley. In addition to their own antioxidant activity, flavonoids help the body to absorb and better utilize vitamin C. Catechin flavonoids are found in green and black tea; iced versions of either make a delicious antioxidant-rich summertime beverage.

Reservatrol is a powerful phytochemical antioxidant found in grapes and some berries. Grapes, grape juice and, yes, wine (especially red wine) are excellent reservatrol sources.

Summer's antioxidant-rich offerings are as pleasing to the palate as they are to the body. Indulging in the entire spectrum of antioxidant-rich fruits and vegetables helps counter a broader array of free radicals while enlivening the diet with fresh, diverse flavors. Of course, antioxidants cannot instantly turn back the clock. But increased dietary antioxidant intake means increased protection against age-accelerating free radical damage. While externally this protection might mean more youthful skin, the true benefit lies inside, as antioxidants tirelessly fight disease throughout the entire body.