

## **Oxidants, antioxidants, and the degenerative diseases of aging.**

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Metabolism, like other aspects of life, involves tradeoffs. Oxidant by-products of normal metabolism cause extensive damage to DNA, protein, and lipid. We argue that this damage (the same as that produced by radiation) is a major contributor to aging and to degenerative diseases of aging such as cancer, cardiovascular disease, immune-system decline, brain dysfunction, and cataracts. Antioxidant defenses against this damage include ascorbate, tocopherol, and carotenoids. Dietary fruits and vegetables are the principal source of ascorbate and carotenoids and are one source of tocopherol. Low dietary intake of fruits and vegetables doubles the risk of most types of cancer as compared to high intake and also markedly increases the risk of heart disease and cataracts. Since only 9% of Americans eat the recommended five servings of fruits and vegetables per day, the opportunity for improving health by improving diet is great.

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**Sottoprodotti ossidanti del normale metabolismo causano un danno estensivo al DNA, alle proteine e ai lipidi. Tale danno (lo stesso causato dalle radiazioni) è la causa principale dell'invecchiamento e di malattie degenerative come cancro, malattie cardiovascolari, declino delle funzioni immunitarie, degenerazione cerebrale e cataratta.**

**I sistemi di difesa antiossidante comprendono ascorbato, tocoferoli e carotenoidi. La frutta e le verdure ne sono le fonti principali.**

**Un basso consumo di frutta e verdura raddoppia il rischio di cancro ed inoltre aumenta in modo marcato il rischio di malattie cardiache e cataratta.**

**Visto che solo il 9% degli americani consuma le cinque porzioni raccomandate di frutta e verdura al giorno, l'opportunità per migliorare la salute migliorando la dieta è grande.**