Antioxidants and health

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Antioxidants are substances that protect our cells against the effects of free radicals. Free radicals are molecules produced when our body breaks down food or by environmental exposures to tobacco smoke and radiation. During the course of these normal cellular processes, free radicals are generated and quenched.

Free radicals are produced in our body deliberately

- To serve important biological functions
- To kill some invading bacteria and fungi
- To Regulate cell growth and signalling

Antioxidants interact with and stabilise free radicals and may prevent some of the damage that free radicals might otherwise cause.

Antioxidant status and oxidative stress

- Antioxidant status (AS) is the balance between the antioxidant and prooxidant systems in living organisms.
- A serious imbalance favoring oxidation is defined as oxidative stress. It may result from:
  - Excessive production of ROS and free radicals and/or
  - Weakening of antioxidant system due to lower intake or lower production of endogenous antioxidant or from increased utilization of antioxidants.
- Thus, preventing oxidative stress is important for good health and prevention of disease. Oxidative stress is implicated in numerous diseases such as Coronary heart disease, cancer, ageing, rheumatoid arthritis, cataract, certain neurodegenerative diseases, etc.

Important Antioxidants

Examples of antioxidants include beta-carotene, lycopene, Vitamins C, E and A, and other substances.

Carotenoids

Carotenoids

- There are 500 different carotenoids (50 in diet).
- They are natural pigments with antioxidant activity.
- Beta carotene –a precursor of vitamin A is the most common of all the carotenoids.
- Beta-carotene is found in many foods that are orange in colour, including sweet potatoes, carrots, pumpkin, and mangoes. Some green leafy vegetables including spinach (palak), are also rich in beta-carotene.
- Other carotenoids and their sources.
  - Lycopene - Tomatoes, watermelon, guava, papaya, apricots, oranges,and other foods.
  - Cryptoxanthin- Citrus.
  - Zeaxanthin- Maize
- Fats when consumed along with them enhances availability of antioxidants.
- Cooking and food processing – improves availability of carotenoids.
- Vitamin A as such has little antioxidants activity.

Other antioxidants

- Selenium is a mineral, not an antioxidant nutrient. However, it is a component of antioxidant enzymes. The amount of selenium in soil, which varies by region, determines the amount of selenium in the foods grown in that soil. Animals that eat grains or plants grown in selenium-rich soil have higher levels of selenium in their muscle.
- Vitamin E, also known as alpha-tocopherol, is found in almonds, in many oils including wheat germ, safflower, corn and soybean oils, and also found in mangoes, nuts, broccoli and other foods.

Flavonoids: Large group of phenolic antioxidants

- Occurrence: Fruits, vegetables, beverages (tea, wine, beer), groundnut, broccoli, apples, cherries, soy products.
- Other Phenolic Compounds.
  - Olive oil: Diets rich in olive oil are good for health.
  - Rosemary, Sage and Mint.
  - Turmeric : Curcumin-Antioxidant, hypoglycemic, hypocholesterolemic, anticancer, anti-inflammatory, etc.
  - Cloves: Eugenol (excellent antioxidant).
  - Garlic & Onion: S-allyl compounds (SAS).
  - Capsicum: Capsacin.
  - Fenugreek, coriander, amla, basil are also full of antioxidants.

Age groups that benefit from antioxidants

- Pregnant woman.
- Neonates and children.
- Old people.
- Sports persons.

sports persons.

Source: Portal Content Development Team
