

ANTIOXIDANTS (АНТИОКСИДАНТИ)

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Доповідь висвітлює проблему антиоксидантів, які захищають клітини організму від пошкоджень та окислення в результаті дії вільних радикалів.

Antioxidants are specific organic compounds that are active in the prevention of very rapid harmful chemical chain reactions with oxygen or nitric oxide, that is, oxidation reactions. In the body, oxidation reactions generally involve highly reactive molecules called free radicals. Free radicals reside primarily in the mitochondria of cells. When free radicals are released from the mitochondria in numbers sufficient to overwhelm the protective biochemical systems of the body, they become a threat to some cellular structures such as lipids, proteins, carbohydrates, and nucleic acids in cell membranes. Compromised cellular structure alters cellular function, and may lead to the initiation of the disease process. In severe oxidative stress, cell death may occur. Antioxidants react with the free radicals before they are able to react with other molecules, thus providing protection from oxidation reactions.

There are many kinds of antioxidants. They are important in the neutralization or scavenging of “oxygen free radicals” which are normal by-products of body metabolism. Controlled amounts of free radicals are necessary as weapons against viruses and bacteria, as well as for their roles in hormone production and numerous enzyme-catalyzed reactions. However, excess free radicals can damage cellular DNA, destroy cell membranes, and lead to long-term immune system damage and cancer.

Excessive amounts of free radicals are formed from exposure to radiation, including sunlight, environmental pollution, and high-fat diets.

Antioxidants are found in many forms. The principal vitamins are E and C, and beta-carotene. A final group of compounds, synthetic antioxidants, are often added to foods to prevent discoloration and delay oxidation of the foods after exposure to oxygen. Most of the antioxidants used in foods are phenolic compounds. For people, a diet high in fresh fruits and vegetables may contain adequate natural antioxidants. An example of a diet that provides optimal levels of antioxidants is the Mediterranean diet. It is rich in olive oil, foods from whole grains, and tomatoes, and minimizes the daily intake of poultry, eggs, sweets, and red meat.