

Nutraceuticals: “Let Food be your Medicine”



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nutraceuticals in detoxifying the body, avoiding vitamin and mineral deficiencies and restoring healthy digestion and dietary habit. Phytonutrients basically are plant nutrients with particular biological activities in supporting human health.

Category of Nutraceuticals

Nutraceuticals can be divided in 3 categories:

- Substances with established nutritional functions, such as vitamins, minerals, amino acids, and fatty acids–Nutrients.
- Herbs or botanical products as concentrates or extracts Herbals.
- Reagents derived from other sources (e.g., pyruvate, chondroitin sulfate, steroid hormone precursors) serving specific functions, such as sports nutrition, weight-loss supplements, fortified conventional foods, and meal replacements–Dietary supplements.

Nutraceuticals and their medical indications

• Alzheimer’s disease

Alzheimer’s disease (AD) is the most common form of dementia. There is no cure for the disease and eventually leads to death. Most often, AD is diagnosed in people over 65 years of age, although the less-prevalent early-onset Alzheimer’s can occur much earlier. There were 26.6 million sufferers worldwide in 2006 and is predicted to affect 1 in 85 people globally by 2050.

Women are more affected in comparison to men, at a ratio of almost 2:1. Several lines of evidence suggest that oxidative stress might be related to a number of neurodegenerative disorders including AD. **Nutraceutical antioxidants such as curcumin, lutein, lycopene, turmerin and β-carotene may exert positive effects on specific diseases by combating oxidative stress.**

• Cardiovascular diseases (CVD)

Worldwide, the prevalence of CVD is increasing. CVD is a term which is used for disorders of the heart and blood vessels and includes coronary heart disease (heart

attack), peripheral vascular diseases, cerebrovascular disease (stroke), hypertension, heart failure, and so on. It is believed that a low intake of vegetables and fruits is associated with a high mortality in CVD. The Majority of the CVD are preventable. Many studies have reported a protective role for a diet rich in vegetables and fruits against CVD.

Nutraceuticals in the form of vitamins, minerals, antioxidants, dietary fibers and omega-3 polyunsaturated fatty acids together with physical exercise are recommended for prevention and treatment of CVD. The molecules such as polyphenols alter cellular metabolism and signaling, which is believed to reduce arterial disease.

• Cancer

Cancer has emerged as a major public health problem in developing countries. According to the World Cancer Report, the cancer rates are increasing and it would be 15 million new cases in the year 2020 that is, a rise in 50%. A healthy lifestyle and diet can help in prevention of cancer. **Carotenoids are a group of phytochemicals responsible for different colors of the foods. They have antioxidant activities and effective on cancer prevention. Recent interest in carotenoids has focused on the role of lycopene in human health, especially in cancer disease.**

Plants rich in daidzein, biochanin, isoflavones and genistein, also inhibit prostate cancer cell growth. Because of the unsaturated nature of lycopene, it is considered to be a potent antioxidant and a singlet oxygen quencher. Lycopene concentrates in the prostate, testes, skin and adrenal where it protects against cancer. The linkage between carotenoids and prevention of cancer heightened the importance of vegetable and fruits in human diet.

• Diabetes

The most common form of diabetes is type 2 diabetes with 95% prevalence and is associated with obesity. Although various drugs for prevention and treatment of diabetes have been introduced, however, globally the total number of people with diabetes with various causes is increasing. Diabetes, not only imposes considerable economic burdens on individual patients and their families but also places substantial economic burdens on society.

In recent years a wide range of herbal dietary supplements and herbal medicines have scientifically proven to benefit type 2 diabetes mellitus in preclinical studies, however, few have been proven to do so in properly designed randomized clinical trials.

Isoflavones are phytoestrogens which have structural/functional similarities to human estrogen. **Soy isoflavones have been studied most and their consumption have been associated with lower incidence and mortality rate of type II diabetes, heart disease, osteoporosis and certain cancers.**

• Immune system

A wide variety of nutraceuticals have been shown to impose crucial roles in immune status and susceptibility to some diseases conditions. Nutraceuticals that belong to the category of immune boosters are useful to improve the immune function. They include extracts from the coneflowers, or herbs of the genus *Echinacea*, such as *Echinacea angustifolia*, *Echinacea pillida*, *Echinacea purpurea*. The coneflowers in particular are a popular herbal remedy used in the central United States, an area to which they are indigenous. *Astragalus mongolicus*, *Astragalus membranaceus*, and other herbs of the *Astragalus* genus are also effective immune boosters. *Astragalus* stimulates development and transformation of stem cells in the marrow and lymph tissue to active immune cells. Phytoestrogens mostly are recommended for prevention of various diseases related to hormonal imbalance. There is a special interest in soy isoflavones as potential superior alternatives to the synthetic selective estrogen receptor modulators, which are currently applied in hormone replacement therapy. **Garlic and morphine also are good example of the nutraceuticals, which respectively stimulate and suppress immune system.**

Nutraceuticals might be defined as substances that have physiological benefits or provide protection against chronic diseases. Nutraceuticals may be used to improve health, delay the aging process, prevent chronic diseases, increase life expectancy, or support the structure or function of the body. Nowadays, nutraceuticals have received considerable interest due to potential, nutritional, safety and therapeutic effects. Recent studies have shown promising results for these compounds in various complications.