



Phytoestrogens as Antioxidants: Health Benefits and its Side Effects

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Description

Phytoestrogens are plant compounds that are a major component of traditional Asian diets and may protect against certain hormone-dependent cancers (breast and prostate) as well as coronary heart disease. They may also be able to function as antioxidants, scavenging potentially harmful free radicals. Antioxidant species may act naturally to reduce oxidative damage to DNA, protein, and lipids, thereby reducing the risk of coronary heart disease and cancer.

Phytoestrogens may protect against chronic diseases such as hormone-dependent cancers (such as breast and prostate cancer), cardiovascular disease, and osteoporosis. Studies on the metabolism and bioavailability of phytoestrogens are also of great importance. Conversion of the intestinal micro flora of daisein into its metabolite isoflavan equol, which is a more powerful oestrogen and antioxidant, occurs only in some individuals (about 35% of subjects are equol excretors). This has significant implications for the bioavailability of daidzein as well as for the risk of cancer. Oxidative damage is associated with the development of cardiovascular disease and cancer, and soy phytoestrogens reduce plasma F2-isoprostane (a biomarker of lipid peroxidation *in vivo*) and increase resistance to low-density lipoprotein oxidation. This antioxidant effect of phytoestrogens may potentially contribute to their therapeutic efficacy.

The structure of phytoestrogens resembles the steroid hormone 17 β -estradiol, and phytoestrogens can bind to the estrogen receptor. The physiological effects of these compounds are not limited, however, to estrogenic modulation. Phytoestrogens can also function as antioxidant species. Genistein has been shown to increase antioxidant enzyme activity in mice. Genistein has been shown to significantly inhibit the formation of H₂O₂ induced

ARTICLE HISTORY

Received: 29-Nov-2022, Manuscript No. EJMOAMS-22-82534;
Editor assigned: 02-Dec-2022, PreQC No. EJMOAMS-22-82534 (PQ);
Reviewed: 19-Dec-2022, QC No. EJMOAMS-22-82534;
Revised: 26-Dec-2022, Manuscript No. EJMOAMS-22-82534 (R);
Published: 02-Jan-2023

by the phorbol ester tumor promoter; both *in vitro* and *in vivo*, by inhibiting the formation of reactive oxygen species. Genistein also exhibits antioxidant activity, preventing red blood cell haemolysis by dialyric acid or hydrogen peroxide and protecting microsomal lipid peroxidation induced by the Fe²⁺-ADP complex.

It is believed that under appropriate conditions, virtually all cellular components, including lipids, nucleic acids, and proteins, are susceptible to damage by reactive oxygen species. At normal oxygen tension, these mechanisms are sufficient to maintain homeostasis, and even when free oxygen radicals are formed, they are efficiently scavenged. However, under conditions of increased oxidative stress, the concentration of free radicals can increase uncontrollably.

Benefits

Phytoestrogens may be helpful for women who want to rebalance their hormones as they approach menopause. During perimenopause, which is the period before a woman reaches menopause and stops menstruating; her body's hormone levels will fluctuate and cause a variety of symptoms. Phytoestrogens are a natural alternative to the synthetic oestrogens used in hormone replacement therapy.

Preventing osteoporosis: Oestrogen deficiency after menopause can affect bone health and cause conditions such as osteoporosis. Hormone Replacement Therapy (HRT) can help correct this and increase bone strength, but it can have unpleasant side effects. Phytoestrogens can be a natural alternative.

Combatting menstrual issues: When woman's estrogenic levels drop, it can affect mood and energy levels. Some women try to eat foods rich in phytoestrogens during this time to balance hormone levels and relieve symptoms.

Promoting heart health: Phytoestrogens may support heart health. It has helped treat a condition that affects the arteries and improve heart health in postmenopausal women.

Risks and side effects

A Phytoestrogen supplementation had a safe side effect

profile with moderately increased rates of gastrointestinal side effects such as abdominal pain and myalgia and somnolence. They were not associated with an increased risk of breast cancer, endometrial cancer, vaginal bleeding, and endometrial hyperplasia.