



HEALTH BENEFITS OF NUTRACEUTICALS

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DOI: <https://doi.org/10.5281/zenodo.17232831>

Article Received on 25/04/2023

Article Revised on 15/05/2023

Article Accepted on 05/06/2023

ABSTRACT

Nutraceuticals are products used as medicines in addition to nutrition. Nutraceuticals can be defined as substances that have physiological benefits or provide protection against chronic disease. Nutraceuticals can be used to improve health, slow down the aging process, prevent chronic diseases, increase life expectancy or support body structure or function. Nutraceuticals are getting a lot of attention these days because of their potential nutritional, safety and therapeutic benefits. Recent studies have shown that these compounds have promising results in various complications. In this review, we have made a great effort in proposing new concepts for nutraceuticals based on disease indications. Highlights herbal remedies that are effective for harsh therapeutic conditions associated with oxidative stress, including allergies, Alzheimer's disease, cardiovascular disease, cancer, diabetes, eye, immunity, inflammation, and Parkinson's disease and obesity. These nutraceuticals are used in various diseases, their application, and current market demand. Examples of fish oil preparations, prebiotics and probiotics reviewed.

KEYWORDS: Nutraceutical, Dietary supplements, Antioxidants, Probiotics, Health benefits.

INTRODUCTION

Nutraceuticals are characterized as 'specially designed preparations', formulated with the aim of fulfilling specific dietary requirements and/or offer preventive health care. Nutraceuticals are the formulation of nutrient/nutrients which helps in prevention and treatment of some diseases, in addition to a supplement diet. Nutraceutical is a term given by Dr. Stephen De Felice in 1989 and came from two words "nutrition" and "pharmaceutical". These are foods or a part of foods that are beneficial in providing various health benefits including the treatment and/or prevention of the disease. Science of nutrition has increasingly achieved new horizons, starting from the anticipation of deficiencies in nutrients to prominence on human health and prevention and treatment of chronic ailments. Terms 'nutraceuticals', 'food supplements', 'dietary supplements' have evolved after the concept was originated by Dr. De Felice.^[1]

With an increase in age, human body starts to produce a smaller number of T cells due to thymus atrophy, thus making an individual susceptible to lethal infections. Therefore, nutrition can play a significant role in assisting the immune system and in optimizing cell functions, including the cells acting in the immune function of the body. Nutraceuticals serve to functionalize food and boost the idea of diet as daily nourishment in health-related aspects.^[2]

2. Classification

A. Based on chemical constituent

1) Nutrients

Vitamin A, K, E, C, B1, B2, B3, B6 folic acid, calcium, iron, magnesium, Phosphorous, Chromium, cobalt, copper, iodine.

2) Herbals or botanical

3) Dietary supplements

1. Ketogenic diets
2. Minimally refined grains
3. Phytoestrogens
4. Several species of edible mushrooms
5. Glucosamine sulfate and chondroitin sulfate
6. Peptides/Hydrolysates
7. Dairy foods

B. Traditional and Non- Traditional nutraceuticals

1. Traditional nutraceuticals
2. Non-traditional nutraceuticals

C. Based on diseases

1. Diabetes
2. Obesity
3. Cancer
4. Anti-inflammatory activities
5. Allergy
6. Alzheimers disease
7. Vision improving agents

8. Osteoarthritis^[3]**ROLE OF NUTRACEUTICALS****1) CVS disease**

Dietary fibers, antibiotics omega-3-polyunsaturated fatty acids, vitamins, minerals are for the prevention under treatment of CVS disease. Polyphenol (in grape) prevent and control arterial diseases Flavonoids (in onion, vegetables, grapes, red wine, apples, and cherries) block the ACE and strengthen the tiny capillaries that carry oxygen and essential nutrients to all cells. Rice bran lowers the serum cholesterol levels in the blood, lowers the level of (LDL) and increases the level (HDL) in cardiovascular health. The higher the ratio more will be the risk of coronary heart diseases. Rice bran contains both Lutein and Zeaxanthin, which improves eyesight and reduces the chance of cataracts. The essential fatty acids, omega-3, omega-6, omega-9, and folic acid in rice bran are also promoting eye health. It is reported that a low intake of fruits and vegetables is associated with high mortality in CVS disease.^[4]

2) Diabetes

The use of ethyl esters of N-3 Fatty Acids may be beneficial in diabetic patients. Docosahexaenoic acids (DHA) modulate insulin resistance and are also vital for neurovascular development. Docosahexaenoic acid is an omega-3 fatty acid that is found along with eicosapentaenoic acid (EPA) in cold-water fish, including tuna and salmon. DHA plays a key role in the development of eye and nerve tissues.^[5]

3) Cancer

Flavonoids, which block the enzymes that produce estrogen, reduce estrogen-induced cancers. Prevent prostate/breast cancer a broad range of Phyto-pharmaceuticals with a claimed hormonal activity, called "phytoestrogens" is recommended. Soy foods source of isoflavones, curcumin from curry, and soy isoflavones possess cancer chemo preventive properties. Lycopene concentrates in the skin, testes, adrenal, and prostate where it protects against cancer.^[6]

4) Irritable bowel syndrome

Inflammatory bowel diseases/ syndrome including Crohn's disease and ulcerative colitis are a group of idiopathic chronic and relapsing inflammatory disorders of the GIT tract. Whose incidence and prevalence have been increasing in the last decades. Nutraceuticals is a broad term used to describe any product derived from food sources claiming extra health benefits.

Beyond the intrinsic nutritional value found in foods. The beneficial effects of nutraceutical compounds in human health have been emerging in the last decades.^[7]

5) Obesity

Obesity is a global public health problem and is defined as the accumulation of the unhealthy amount of body fat. It is well-established risk factor for many disorders like

angina pectoris, congestive heart failure (CHF), hypertension, hyperlipidemia, respiratory disorders, renal vein thrombosis, osteoarthritis, cancer, and reduced fertility.^[7]

6) Gastro-intestinal disease

Eating habits and trends in food production and consumption have health, environmental and social impacts. Diet has implications on gut health. Gut complications, such as ulcerative colitis, Crohn's disease, irritable bowel syndrome, and gluten therapy-resistant celiac, result from overgrowth and imbalance of intestinal microbial flora and are related to one's diet. Gut health determines an individual's overall health.

- It may increase the health value of our diet
- It may help us live-life longer
- It may help to avoid a particular medical condition
- It may present food for populations with special needs^[8]

7) Nutraceuticals in drug delivery

Nutraceuticals are mostly absorbed by the oral route the major concern is the absorption of nutraceutical products by the GI tract and also its fate after first-pass metabolism therefore the absorption kinetics and the pharmacokinetics of these products are still in a mist. This presents a unique challenge to many nutraceutical products and so research thrust on their delivery approaches is now gaining momentum. A very common example is the marketed nutraceutical containing Milk thistle plant extract recommended for hepatoprotection. The main bioactive component of the extract silymarin suffers from degradation in the GIT which is a major setback to the efficacy of nutraceuticals. A similar problem is also observed in different bioactive like alpha-tocopherol, ascorbic acid, curcumin, green tree extract, lycopene used in various nutraceutical formulations.^[9]

So, researchers are trying to solve the issue by using modern drug delivery approaches to improve the efficacy of nutraceuticals^[10] The most common and widely explored approach in nutraceutical drug delivery is based on nano-technological intervention. Nanoscale delivery of nutraceuticals has a definite impact on the absorption and distribution kinetics of the nutraceuticals leading to product efficacy enhancements protecting the nutraceuticals against GIT degradation and first-pass effect.^[11]

Nano emulsions-based drug delivery system are nano micelles are obtain explored to improve oral bioavailability of nutraceuticals as these products are mostly given by oral route. Different delivery approaches like nanoparticles, liposomes, micelles, phospholipid complexes are designed to achieve bioavailability enhancements.^[12]

MARKET GROWTH OF NUTRACEUTICALS

The nutraceuticals market size has the potential to grow by USD 216.23 Billion during 2021-2025 and the market's growth momentum will accelerate during the forecast period. This report provides a detailed analysis of the market by product (functional food, functional beverages, and dietary supplements) and geography (APAC, EUROPE, MEA NORTH AMERICA & SOUTH AMERICA) also the report analyzes the market's competitive landscape and offers information on several market vendors, including Abbott Laboratories, Archer Daniels Midland Co, BASF Se Cargill Inc. Danone SA, General Mills Inc., KelloggCo., Nestle SA, PepsiCo. NC and Coca-Cola Co Chawanprash is one, of the highest marketing nutraceutical product in INDIA. It contains spicing ingredients such as cinnamon, clove. Curcuma spp., saffron, and long pepper are good sources of vitamins C and are rich in antioxidants that help in increasing immunity, increase digestion, and prevent cough, asthma, fever, heart disease, impotency, and coarseness speech.^[13]

CONCLUSION

Nutraceuticals have proven health benefits and disease prevention capabilities, which should be taken under their acceptable recommended intake. Nutraceuticals play an important role in therapeutic development in the current self-medication landscape, but their success depends on maintaining their quality, purity, safety, and efficacy. At present, a wide range of nutraceuticals have been successfully marketed due to their excellent therapeutic activity against various diseases.

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