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NUTRACEUTICALS: A REVIEW

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ABSTRACT:

Nutraceuticals are the pharmaceutically blended products that possess both nutritional as well as the medicinal value. Such a product is designed to improve the physical health, fight against day-to-day challenges such as stress, increase longevity, etc. Nowadays, emphasis is given to those herbs which are used as food and medicine due to its greater acceptance. Due to dynamic action, the popularity of nutraceuticals among people as well as healthcare providers has been increased over medicines and health supplements. is review documents herbs with a wide variety of therapeutic values such as immunity booster, antidiabetic, anticancer, antimicrobial, and gastroprotective. these herbs could be better options to formulate as nutraceuticals. Several nutraceuticals are described based on their availability as food, chemical nature, and mechanism of action.

KEYWORDS: *Nutraceuticals,Classification, Its Diseases*

INTRODUCTION:

Nutraceutical is the hybrid of nutrition and pharmaceutical. Nutraceuticals in broad are food or part of food playing a significant role in modifying and maintaining normal physiological function that maintains healthy human beings. The food products used as nutraceuticals can be categorized as dietary fibre prebiotics, probiotics, polyunsaturated fatty acids, antioxidants and other different types of herbal natural foods. These nutraceuticals used in various diseases such as obesity, cardiovascular diseases, cancer, osteoporosis, arthritis, diabetes, cholesterol etc. In whole nutraceutical has lead to the new era of medicine and health, in which the food industry has become a research oriented sector. This article aim to provide the knowledge of nutraceutical with its uses in various diseases. Triphala is one of the most revered tonics in Ayurveda. It is a combination of three important herbs, namely, *Terminalia bellerica* (Combretaceae), *Terminalia chebula* (Combretaceae), and *Emblica officinalis* (Phyllanthaceae). All these herbs act as a nutritive tonic. Triphala benefits almost all

organs/systems of our body, particularly skin, liver, eyes, and digestive and respiratorysystem.most well-known therapeutic uses are immunomodulating, antibacterial, antimutagenic, and adaptogenic, etc., which are well established.

CLASSIFICATION OF NUTRACEUTICALS:

Regarding the promise of nutraceuticals, they should be considered in two ways:

a) Potential nutraceuticals

b) Established nutraceuticals

A potential nutraceutical is one that holds a promise of a particular health or medical benefit; such a potential nutraceutical only becomes an established one after there are sufficient clinical data to demonstrate such a benefit. It is disappointing to note that the overwhelming majority of nutraceutical products are in the potential category, waiting to become established. The food products used as nutraceutical are categorized as-

• Probiotic

• Prebiotic

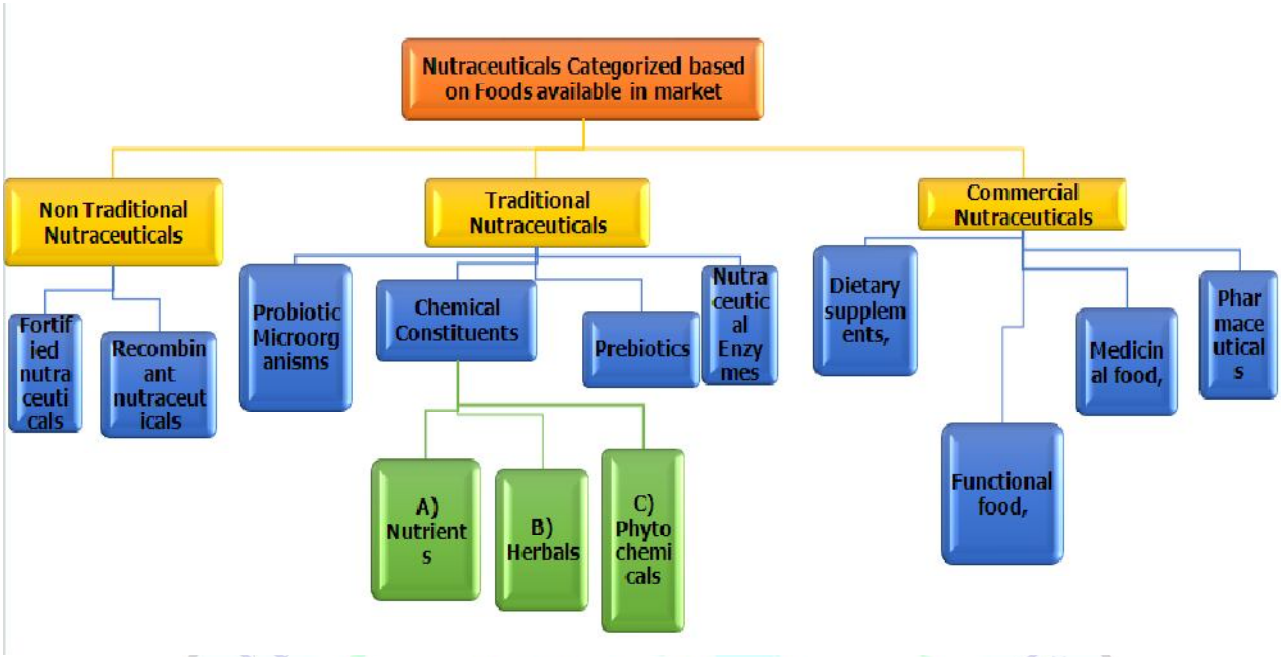
• Dietary fiber

• Omega 3 fatty acid

• Antioxidant Probiotic

Categories based on natural source:

- ✓ Carbohydrates & Fiber
- ✓ Fat & Essential fatty acids
- ✓ Protein
- ✓ Minerals like Macro minerals & Trace minerals
- ✓ Vitamins
- ✓ Water
- ✓ Other nutrients like Antioxidants, Photochemical & Intestinal bacterial flora Recombinant nutraceuticals



NUTRACEUTICALS REVOLUTION:

The nutraceuticals revolution began in the early1980s, sparked off when the actual or potential clinical benefits of calcium, fiber and fish oil were supported by clinical studies published in distinguished medical journals, and when physicians began to educate their colleagues and consumers about these substances via the mass media.

Factors effecting Revolution:-

• **Physician** - Increased physician acceptance of the medical benefits of nutritional products increased market demand of nutraceuticals.

• **Media** - The mass media have emerged as the primary sources of medical claims, mass media has now become the powerful and legitimate promotion agency of nutraceutical products.

COMMON NUTRIENTS AND THEIR ASSOCIATED HEALTH BENEFITS:

Nutrients	Health benefits
Fat Soluble Vitamins Vitamin A	Antioxidant, essential, for growth and development, maintains healthy vision, skin and mucous membranes, may aid in the prevention and treatment of certain cancers and in the treatment of certain skin disorders
Vitamin D	Essential for formation of bones and teeth, helps the body absorb and use calcium
Vitamin E	Antioxidant, helps form blood cells, muscles, lung and nerve tissue, boosts the immune system
Vitamin K	Essential for blood clotting

Water Soluble Vitamins Vitamin C	Antioxidant, necessary for healthy bones, gums, teeth and skin, helps in wound healing, may prevent common cold and attenuate its symptoms
Vitamin B1	Helps to convert food in to energy, essential in neurologic functions
Vitamin B2	Helps in energy production and other chemical processes in the body, helps maintain healthy eyes, skin and nerve function
Vitamin B3	Helps to convert food in to energy and maintain proper brain function
Vitamin B6	Helps to produce essential proteins and convert protein in to energy
Vitamin B12	Helps to produce the genetic material of cells, helps with formation of red blood cells, maintenance of central nervous system and synthesize amino acids and is involved in metabolism of fats, protein and carbohydrates
Folic acid	Necessary to produce the genetic materials of cells, essential in first three months of pregnancy for preventing birth defects, helps in red blood cell formation, protects against heart disease
Pantothenic acid	Aids in synthesis of cholesterol, steroids and fatty acids, crucial for intra-neuronal synthesis of acetylcholine
Minerals Calcium	Essential for building bones and teeth and maintaining bone strength, important in nerve, muscle and glandular functions
Iron	Helps in energy production, helps to carry and transfer oxygen to tissues
Magnesium	Essential for healthy nerve and muscle function and bone formation, may help prevent premenstrual syndrome (PMS)
Phosphorous	Essential for building strong bones and teeth, helps in formation of genetic material, energy production and storage
Trace elements Chromium	With insulin helps to convert carbohydrates and fats into energy
Cobalt	Essential component of vitamin B12, but ingested cobalt is metabolized *in vivo* to form the B12coenzymes
Copper	Essential for hemoglobin and collagen production, healthy functioning of the heart, energy production, absorption of iron from digestive tract
Iodine	Essential for proper functioning of the thyroid
Selenium	Antioxidant, essential for healthy functioning of the heart muscle
Zinc	Essential for cell reproduction, normal growth and development in children, wound healing, production of sperm and testosterone
Vitamin like compounds Biotin	Required for various metabolic functions

L- Carnitine	Oxidation of fatty acids, promotion of certain organic acid excretion and enhancement of the rate of oxidative phosphorylation
Choline	Lipotropic agent used to treat fatty liver and disturbed fat metabolism
Vitamin F	Involved in proper development of various membranes and synthesis of prostaglandins, leukotrienes and various hydroxyfatty acids
Inositol	Lipotropic agent necessary for amino acid transport and movement of potassium and sodium
Taurine	Aids in retinal photoreceptor activity, bile acid conjugation, white blood cell antioxidant activity, CNS neuromodulation, platelet aggregation, cardiac contractility, sperm motility, growth and insulin activity

NUTRACEUTICALS AND DISEASES:

1. Cardiovascular diseases:

Anti-oxidants, Dietary fibres, Omega-3 poly-unsaturated fatty acids, Vitamins, minerals for prevention and treatment of CVD. 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. 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 low intake of fruits and vegetables is associated with a high mortality in CVD.

2. Diet related diseases :

In Western societies, the incidence of diet-related diseases is progressively increasing due to greater availability of hyper caloric food and a sedentary lifestyle. Obesity, diabetes, atherosclerosis, and neurodegeneration are major diet-related pathologies that share a common pathogenic denominator of low-grade inflammation. Functional foods and nutraceuticals may represent a novel therapeutic approach to prevent or attenuate diet-related disease in view of their ability to exert anti-inflammatory responses. In particular, activation of intestinal T regulatory cells and homeostatic regulation of the gut microbiota have the potential to reduce low-grade inflammation in diet-related diseases.

3. Heart attack and lung cancer:

Corn‟s contribution to heart health lies not just in its fiber, but in the significant amounts of

folate that corn supplies. Corn maintains the homocysteine, an intermediate product is an important metabolic process called the methylation cycle. Homocysteine is directly responsible for damage of blood vessel heart attack, stroke, or peripheral vascular disease. It has been estimated that consumption of 100% of the daily value (DV) of folate would, by itself, reduce the number of heart attacks suffered by 10%. Corn also contains cryptoxanthin, a natural carotenoid pigment. It has been found that cryptoxanthin can reduce the risk of lung cancer of 27% on daily consumption.

4. Diabetes :-

Ethyl esters of n-3 fatty acids may be beneficial in diabetic patients. Docosahexaenoic acid modulates insulin resistance and is also vital for neurovisual development. Lipoic acid, an antioxidant, for treatment of diabetic neuropathy. Dietary fibers from psyllium have been used for glucose control in diabetic patients and to reduce lipid levels in hyperlipidemia.

5. Obesity :-

Obesity is a global public health problem and is defined as accumulation of unhealthy amount of body fat. It is a 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.

6. **Cancer :-**

Flavonoids which block the enzymes that produce estrogen reducesthe estrogen-induced cancers. Prevent prostate/breast cancer a broad range of phyto-pharmaceuticals with a claimed hormonal activity, called "phytoestrogens" is recommended. Soyfoods source of isoflavones, curcumin from curry and soya isoflavones possess cancer chemopreventive properties. Lycopene concentrates in the skin, testes, adrenal and prostate where it protects against cancer.

7. Osteoarthritis :-

Osteoarthritis (OA), a debilitating joint disorder, is the most common form of arthritis in the United States, where it affects an estimated 21 million people. In 2004, the direct and indirect health care costs associated with all forms of arthritis were approximately 86 billion dollars. Joint discomfort from OA and other joint disorders may reduce physical activity in individuals experiencing this condition, resulting in energy imbalance and weight gain. Increased weight can exacerbate existing problems, through additional stress on joints. Glucosamine (GLN) and chondroitin sulfate (CS) are widely used to alleviate symptoms of OA. These nutraceuticals have both nutrient and pharmaceutical properties and seem to regulate gene expression and synthesis of NO and PGE2, providing a plausible explanation for their anti-inflammatory activities.

8. Parkinson's disease :-

Vitamin E in food may be protective against Parkinson"s disease. Canadian researchers indicated that vitamin E in food may be protective against Parkinson's disease. Creatine appeared to

modify Parkinson‟s disease features as measured by a decline in the clinical signs. Nutritional supplements have shown some promising results in preliminary studies, it is important to remember that there is not sufficient scientific data to recommend them for Parkinson's disease at present. The patients should be cautioned that over-the-counter medications do have side effects and interactions with other drugs and are also expensive.

CONCLUSION :

Nutraceuticals has proven their health benefits and disease prevention capability, which should be taken according to their acceptable recommended intake. In the present scenario of self-medication nutraceuticals play major role in therapeutic development. But their success depends on maintaining on their quality, purity, safety and efficacy.

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