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## Nutraceutical Use in the Current Era

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**Abstract:** - Nutraceuticals, defined as any food or part of food which provides health benefits including prevention or treatment of disease, have emerged as a necessity for consumers in developed as well as developing countries. With changing lifestyle and related diseases, functional ingredients such as vitamins, minerals, amino acids, fatty acids and Probiotics, etc. have also become a part of this category. These nutraceuticals help in combating some of the major health problems of the century such as obesity, cardiovascular diseases, cancer, osteoporosis, arthritis, diabetes, cholesterol etc. Major nutraceuticals possess multiple therapeutic effect with lacking of unwanted effects hence attract more consumer interest. Nutraceutical on the basis of their natural source, chemical grouping, categories into three key terms –nutrients, herbals, dietary supplements, etc.



**Keywords:** - nutraceutical, fortified foods, dietary supplements, Probiotics.

**Introduction:** -

“NUTRACEUTICALS” Term derived from two words Nutrition + Pharmaceuticals commonly used in marketing but has no regulatory definition. Nutraceutical Term commonly used synonymously for designer foods, health foods, fortified foods, functional foods and dietary supplements <sup>(1)</sup>. ‘Nutraceutical’ means any non-toxic food component that has scientifically proven health benefits including prevention and treatment of disease <sup>(1)</sup>. Products isolated or purified from food are sold in medicinal forms not usually associated with food. A nutraceutical has a physiological benefit that it provides protection against chronic diseases <sup>(2)</sup>. In current scenario the regulatory position of nutraceuticals is different depending on the country’s regulatory framework <sup>(3)</sup>.



**Current era in India:** - Nutrition is a poorly understood concept in India. The percentage of people who are properly nourished is very small. The imbalances of nourishment patterns give rise to three categories of people: Over-nourished (about 80 million); Under-nourished (about 380 million) and nourished with calories but not nutrients (about 570 million). The entire population below the poverty line have been considered as under nourished; irrespective of their calorie intake. Similarly, the people who consume less than 175 gm of fruits and vegetables in a day have been considered deficient in micronutrients. Thus, the pressing need of the consumer is to supplement food with external nutrients to avert disease conditions <sup>(4,5,6,7,8,)</sup>. Nowadays, nutraceuticals have received considerable interest due to potential nutritional, safety and therapeutic effects <sup>(9,10)</sup>. Nutraceuticals have been claimed to provide physiological benefits or provide protection against the diseases listed below (and/or have been discovered to behave as): <sup>-(11)</sup>

Cardiovascular agents	Antiobese agents	Antidiabetics	Anticancer agents
Immune boosters	Chronic inflammatory disorders	Degenerative diseases	Rheumatoid Arthritis
Cholesterol Lowering	Blood pressure	Digestive problems	Osteoporosis

**Table no.1: Nutraceuticals used in Diseases**

Today consumers are strongly concerned about their food habits, health and lifestyle. With globalisation and economic development, the quality of life has improved.

Advantage	Limitation
Improve health	Not subjected to same testing and regulations as pharmaceuticals
Delay aging	Majority not regulated by FDA in USA
Increases life expectancy	Companies creating unregulated products to
Food supplies being on a dwindling mode	create a wide profit margin
Markets focusing on supply of highly processed	Bioavailability of nutrients is lower No regulatory definition
Foods lacking sufficient and appropriate nutrients	Effect may be attributed to that of a placebo
Media drawing peoples attention to nutraceuticals	Side effects and toxicity have been continuously reported not only due to ingestion of the nutraceuticals itself but also owing to the possibility of contamination.
Baby boomers reaching golden ages	

**Table no.2: Advantages and limitations in Nutraceuticals.**

**History: -**

Hippocrates, some 2000 years ago, properly stated, "Let food be your medicine, and medicine be your food." (The recognition that "nutraceuticals" play a vital role in health enhancement has sparked a surge in global interest.) Dr. Stephen De Felice, Chairman of the Foundation for Innovation in Medicine, He derive in 1989 "Nutraceutical" the terms mean "Nutrition" and "Pharmaceutical" <sup>(12)</sup>. FIM term was coined by Dr. DeFelice, its meaning has been modified by Health Canada which defines nutraceutical as: a product isolated or purified from foods, and generally sold in medicinal forms not usually associated with food and demonstrated to have a physiological benefit or provide protection against chronic disease <sup>(13,14,15)</sup>. Nutraceutical market is seeing tidal growth mainly in United States, India and European countries. Herbal nutraceutical is used as a powerful instrument in maintaining health and to act against nutritionally induced acute and chronic diseases, thereby promoting optimal health, longevity, and quality of life. Nowadays, nutraceuticals are one of the most rapidly growing segments of the industry with an expected compound annual growth rate (CAGR) of 7.5% (Healthcare Packaging 2019] <sup>(16)</sup>. Nutraceutical is a marketing term used to imply a pharmaceutical effect from a compound or food product that has not been scientifically confirmed or approved to have clinical benefits <sup>(17,18)</sup>.

**Scope: -**

Nutraceuticals play 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 fiber, prebiotics, probiotics, polyunsaturated fatty acids, antioxidants, and other different types of herbal natural foods <sup>(19)</sup>.

Sr.No	Disease	Source	Nutraceuticals
1	Joint health	Glucosamine	Found in ligaments, cartilages
		Chondroitin	Proteoglycans of articular cartilage
2	Cardiovascular health	Co Q-10	Soyabean , olive oil
		Melatonin	Bone marrow pineal glands
		DHA	Fish oil
		Reseveratrol	Grapes, red wine
		Caretonoids	Carrot sweet potato
		Catechin	Tea extracts
3	Eye health	DHA	Linseed (flax oil), fish oil
		Pycnogeal	Barley
		Lutein	Spinach
		Caretonoids	Carrot sweet potato
4	Cancer Prevention	DHA	Linseed (flax oil), fish oil
		Lycopene	Tomatoes, grape fruit

5	Anti-inflammatory activities	Curcumin	turmeric
6	Alzheimer's disease	$\beta$ -carotene, curcumin, lutein, lycopene	Carrot sweet potato, turmeric, Spinach Tomatoes, grape fruit
7.	Adrenal Dysfunction	Flavonoids, eugenol, ginsenoside, withanolide D	Ginkgo biloba, Ocimum sanctum, Panax ginseng and, Withania somnifera

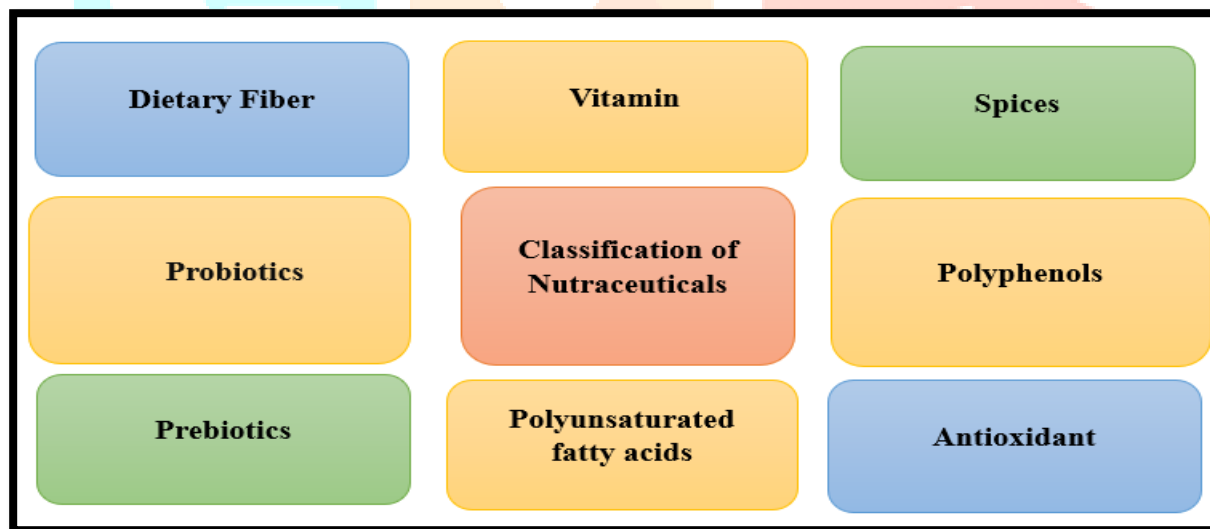
**Table no .3:Food products used in Nutraceuticals.**

**Classification:** -The food sources used as nutraceuticals are all natural and can be categorized as<sup>(20)</sup>.

**Fig no .1:Classification of Nutraceuticals.**

**Dietary Fiber:** - Dietary fiber (DF) consists of non-digestible carbohydrates and lignins that are intrinsic and intact in plants. The adequate intake for fiber defined by the Dietary Reference Intake (DRI) is 38 grams/day for adult men and 25 grams/day for adult women.

**Probiotics:** - Probiotics are live bacteria and yeasts that are good for your health, especially your digestive system. Probiotics are often called "good" or "helpful" bacteria because they help keep your gut healthy.



**Prebiotics:** - Prebiotics are substances that induce the growth or activity of microorganisms (e.g., bacteria and fungi) that contribute to the well-being of their host<sup>(21)</sup>.

**Polyunsaturated fatty acids:** - The group of poly-unsaturated fatty acids (PUFAs) is divided into two groups: omega-3 (n-3) and omega-6 (n-6) polyunsaturated fatty acids. Therefore, they must be obtained from the diet.

**Antioxidant vitamin:** - Antioxidants are our first line of defence against free radical damage, and are critical for maintaining optimum health and wellbeing. Antioxidants are capable of stabilizing, or deactivating, free radicals before they attack cells<sup>(22)</sup>.

**Polyphenols:** - Polyphenols are natural phytochemical compounds in plant-based foods, such as fruits, vegetables, whole grains, cereal, legumes, tea, coffee, wine and cocoa.

**Spice ingredients:** - spice ingredients impart characteristic flavour, aroma and pungency to foods

Application of turmeric extract cream (0.5%) regulates sebum in human skin, person with excessive oily skin or suffering from acne will have great benefit from this property.

**Conclusion: -**

Nutraceuticals are available in the form of isolated nutrients, dietary supplements and specific diets to genetically engineered foods, herbal products and processed foods such as cereals, soups and beverages. Nutraceuticals provide all the essential substances that should be present in a healthy diet for the human. Nutraceuticals provides energy and nutrient supplements to body, which are required for maintaining optimal health. Some Nutraceuticals are useful in maintaining healthy prostate function, remedy for restlessness and insomnia. Nutraceuticals, such as glucosamine and chondroitin sulphate, offer possible chondroprotective effects against joint injury. In case of plant extracts and phytochemicals, various Indian companies have entered their place as supplier both locally as well as globally, which will help in flourishing nutraceuticals sector in near future. Some of the examples :-Fenugreek,Cynodon Dactylon,Bryophyllum ,Alpha lipoic acid , Sage leaves etc.

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