

Food as Nutraceuticals- A Short Note

Keywords: *Fortified food, Functional food, Human diet, Nutraceuticals and Pharmaceutical.*

Nutraceuticals are an emerging natural product that makes the line between food and drugs (Adelaja and Schilling, 1999). Nutraceuticals is combination of two words ‘Nutrient’ (a nourishing food or food component) and ‘Pharmaceuticals’ (a medical drug) by the US physician Dr. Stephen De Felice in the year of 1989. He defined nutraceuticals as a “food, or parts of a food, that provide medical or health benefits, including the prevention and/or treatment of diseases”. Nutraceuticals are derived from herbal products, minerals, vitamins and dietary substances. It is the functional food which aids in the prevention and/or treatment of disease(s) and/or disorder(s) other than anemia. Examples of nutraceuticals include fortified dairy products (e.g. milk) and citrus fruits (e.g. orange juice) (Bull Esther, 2000). Nutraceuticals have proven health benefits and their consumption (within their acceptable Recommended Dietary Intakes) will keep diseases at bay and allow humans to maintain an overall good health (Das *et al.*, 2011).

Demand and challenges for Nutraceuticals

Notoriety of Indian Ayurvedic treatments support the fare openings for formulations dependent on tulsi, ginger, ashwagandha and so on; in that Vitamin D sees the quickest development sought after because of expanding clinical proof of cancer, swine flu disease, and other preventive medication benefits. Increasing trends in preventive therapy and self medication is a major driving force for nutraceutical market.

Worldwide interest for natural (herbal) and non-herbal concentrates is expanding ceaselessly. Green tea for weight reduction and malignant growth treatment, while *Ginkgo biloba* for improving psychological capacity, has been generally utilized as nutraceuticals (Shinde *et al.*, 2014). Some of the difficulties in nutraceuticals are absence of normalization and awareness, high valuing, marketing and circulation. Nutraceutical market has more scope mainly in the nations like India, United States and European nations. Quicker admittance to this market is conceivable through business organization models, powerful regulatory compliance and by assessing key patterns and purchaser reference. Table.1 explains about the natural medicine that is fortified food enriched with Ayurvedic nutraceuticals.

In India, 15 per cent of the country’s population is undernourished and the government has taken many measures to lessen the malnutrition through various initiatives such as Integrated Child Development Services (ICDS), National Health Mission (NHM) and the mid-day meal scheme. As per the World Bank report on ‘Nutrition in India’, India loses nearly US\$12 billion in Gross Domestic Product (GDP) to malnourishment (Yadav and Mehta, 2020). Increasing awareness about the health, disease prevention, high cost of the medication, and handy disposable income are the factors which contributed in increasing demand of the nutraceuticals (Pise *et al.*, 2012).

Nutraceuticals market in India

The nutraceuticals market in India is expected to increase from \$ 4 billion in 2017 to \$ 18 billion in 2025. The market in India is classified into major three groups and they are i) functional food, ii) beverages and iii) dietary supplements. Functional food includes items such as breakfast cereals, and fortified flour, Beverages include commodities like soft drinks, fortified juices, and glucose and Dietary supplements include commodities such as macronutrients, herbal and non-herbal extracts which constitute over 65 percent of the Indian nutraceuticals market.

In 2007, the world nutraceutical market grew to reach \$74.7 billion, compared to that of 2002, when it reached \$46.7 billion (BCC Research). The leading countries having nutraceutical markets include USA, UK and Japan (BCC Research) available in various forms of therapeutics for example capsules, pills, tablets, powders, vials and so on consequently, nutraceuticals could be delivered through different methods such as dermal, oral and ophthalmic routes (Das *et al.*, 2011).

Categorizing nutraceuticals

Nutraceuticals is an expansive umbrella term used to portray any item derived from food sources that gives additional medical advantages in addition to the fundamental healthy benefit found in food sources. There are numerous kinds of products that may be categorized under the class of nutraceuticals. (Stephen D, 2012).

Dietary supplements

The Dietary Supplement Health and Education Act (DSHEA) 1994 defined generally what constitutes a dietary supplement. “A dietary supplement is a product taken by mouth that contains a “dietary ingredient” intended to supplement the diet. The “dietary ingredients” in these products may

include: vitamins, minerals, herbs or other botanicals, amino acids, and substances such as enzymes, organ tissues, glandular, and metabolites. Dietary supplements can also be extracts or concentrates, and may be found in various forms such as soft gels, tablets, gel caps, liquids, capsules, or powders.” (Bhowmik *et al*, 2012).

Functional foods

A food product which is essential for common eating routine yet has helpful impacts that go past the conventional nutritional impacts. Example: Yogurts - Probiotic for intestinal health, Omega-3 milk in prevention of heart disease (Shinde *et al*, 2014). Citrus fruits are also a type of functional food which has already been reported to produce therapeutic effects as antiviral, anticancer, anti-tumor, anti-inflammatory activities and also have potential to stimulate immune (Okwu, 2008). In Japan, all useful food varieties should meet three set up necessities: Food varieties ought to be

- (1) Present in their normally happening structure, as opposed to a tablet, capsule or powder;
- (2) burned-through in the eating regimen as frequently as every day; and
- (3) Manage an organic interaction in order to forestall or controlling illness.

Medical foods

The Food and Drug Administration (FDA) considers medical foods to be “formulated to be consumed or administered internally under the supervision of a physician, and which is intended for the specific dietary management of a disease or condition for which distinctive nutritional requirements, on the basis of recognized scientific principles, are established by medical evaluation” (Jain and Ramawat, 2012).

Table 1. Fortified food varieties with their Ayurvedic nutraceuticals (Shinde *et al*, 2014).

Fortified Foods	Ayurvedic Nutraceuticals
Calcium enriched idly	Bone thickness and Antioxidants enhancer
Probiotic fortified yogurt	Curcumin
Buttermilk	Green tea extract
Omega-3-braced wellbeing beverages and infant food varieties	Brahmi, Fish oil, Lutein, Senna, Sugar free ayurvedic supplement
Dal and Atta noodles	Low calorie sugars

Table 2. Nutraceuticals with their remedial properties (Sarin Rajat *et al*, 2012; Patil C S 2011)

Nutraceutical	Remedial Properties
Common Lycopene	Lessening hazard of prostate and cervical malignancy.
	Supporting cardiovascular health.
Natural Purified Lutein Esters	Dietary supplement
	Functional foods Antioxidants.
Garlic	Cholesterol lowering
	Cardiac diseases
	Diabetic support
Green tea	Cancer prevention
	Weight management
	Lowering Cholesterol
Gymnema, Momordica	Diabetic control
Glucosamine	Arthritis treatment
Gingko Biloba	Allergy relief
Digestive enzymes	Digestive support
Ginseng	Immunomodulator
Phycocyanin Powder	Antioxidant

Nutraceuticals and Diseases

“Nutraceuticals are currently receiving recognition as being beneficial in coronary heart disease, obesity, diabetes, cancer, osteoporosis and other chronic and degenerative diseases such as Parkinson’s and Alzheimer’s diseases” (Bhowmik *et al.*, 2013). Different Nutraceuticals with their remedial properties are given in Table.2.

CONCLUSION

Nutraceuticals have proven medical advantages and their utilization (inside their worthy Recommended Dietary Intakes) will keep illnesses at control and permit humans to regulate an overall

wellbeing. Majority of Global disease burden is under nutrition and micronutrient deficiencies, especially in developing countries where rates are very high (Ganapathy and Bhunia, 2016). The nutraceuticals market is growing day by day worldwide as dietary enhancements, utilitarian food varieties and beverages. But dietary supplements are not as effective as their natural sources. Awareness about nutraceuticals must be created among rural people by developing new eating habits. The difficulties like lack of standardization, high valuing, marketing and circulation should be overcome for rural health improvement in the way of establishing uniform operation worldwide.

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