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Nutraceuticals: A new market in India and its future perspective

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Abstract

Now a days in modern day life style peoples are deeply concerned for their health that how to manage their healthy life. High work load hectic work schedule frustrated them due to expensive treatment of modern diseases. Due to severe side effects of allopathic medicines, lack of proper diet, improper eating of fast foods like Chinese food cause deficiency of vitamins, proteins in the body so consumers are looking for the supplement that provides proper vitamin and protein source without any side effect, so consumers are moving towards nutraceuticals like health supplements, multivitamins dosage form etc. The market share of nutraceuticals increasing day by day because of its unique benefits. This article highlight that how in last few years how nutraceuticals established in the market place and upcoming ten to twenty years nutraceuticals will be the largest market in the Indian drugs market.

Keywords: Nutraceutical, food supplements, safety, efficacy

Introduction

Hippocrates in 400 BC was quoted, "Let food be thy medicine and medicine be thy food" which holds true in today's world as well. The word "nutraceutical" was first coined by Stephen De Felice, MD, founder and chairman of the Foundation for Innovation in Medicine (FIM), in 1989 from the two terms 'nutrition' and 'pharmaceutical'. According to De Felice, nutraceutical can be defined as, "a food (or part of a food) that provides medical or health benefits, including the prevention and /or treatment of a disease."¹

Nutraceutical can be defined as a product containing food substance or substances presented in the form of a formulation or recipe and are having useful properties for treating or preventing disease in human beings. A nutraceutical can prevent a disease or ailment, relieve the symptoms or cure a specific disease. Nutraceuticals can contribute towards health care because of their complementary role. They help to maintain health or a healthy lifestyle.

The consumers are shift towards nutraceuticals because of below given reasons:

- Increasing numbers of consumers, concerned about safety, efficacy of product with cost.
- Disappointed by pharmaceutical allopathic drugs, products in promoting health are turning to nutraceuticals to improve their health and prevent chronic disease.
- Health care provider found the fact that our heavily processed food supply, coming from crops grown with chemical fertilizers, pesticides, herbicides, and often genetically modified seeds, lacks sufficient nutrients necessary for optimum health so to overcome all this nutraceuticals are the best term.
- People believing more in prevention than a cure.
- People who have chronic diseases and have found no results by allopathic medicines.
- Economically challenged patients who can't afford the natural source of proteins and vitamins as shown in the figure 1 [1-7].

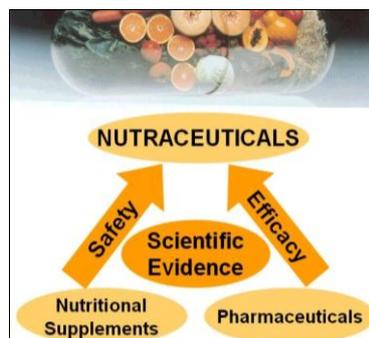


Fig 1: Nutraceuticals Safety & Efficacy [8]

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Nutraceutical Categories

Dietary Supplements including botanicals

- Vitamins, minerals, co-enzyme Q, carnitine
- Gingseng, Gingko Biloba, Saint John's Wort, Saw Palmetto

Functional Foods

A food product that is part of usual diet but has beneficial effects that go beyond the traditional nutritional effects

Examples

- Yogurts- Probiotics for intestinal health.
- Foods/cereals/snacks enriched with soluble fibres, vitamins and minerals.
- Omega-3 milk in prevention of heart disease
- Canola oil with lowered triglycerides for cholesterol reduction
- Oats, bran, psyllium and lignin's for heart disease and colon cancer
- Prebiotics - oligofructose for control of intestinal flora
- Stanols (Benecol) in reduction of cholesterol adsorption

Medicinal Foods

- Health bars with added medications
- Transgenic cows and lacto-ferrin for immune enhancement
- Transgenic plants for oral vaccination against infectious diseases [2-6].

Materials and Methods

Classification of nutraceuticals

Nutraceuticals is a wide term describes the products from natural food sources that provide health benefits which is beneficial for the body with basic nutritional value found in foods. Nutraceuticals allege to prevent severe diseases, improve health, delay the aging process, and improve life expectation.

Dietary supplements

A dietary supplement is a product that contains nutrients consequential from food products that are concentrated in

liquid or capsule form taken by mouth that contains a dietary ingredient intended to supplement the diet stated by Dietary Supplement Health and Education Act (DSHEA) of 1994. The dietary ingredients in these products may include: vitamins, minerals, herbs or other botanicals, amino acids, and substances such as enzymes, organ tissues and metabolites shown in the figure 2. Dietary supplements can also be extracts or concentrates, and may be found in many forms such as tablets, capsules, soft gels, gel caps, liquids, or powders.

Dietary supplements do not have to be approved by the U.S. Food and Drug Administration (FDA) before marketing. Although supplements claim to provide health benefits, products usually include a label that says: These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

Functional foods

Functional foods are designed to allow consumers to eat enriched foods close to their natural state, rather than by taking dietary supplements manufactured in liquid or capsule form. Functional foods have been either enriched or fortified, a process called nutrification. This practice restores the nutrient content in a food back to similar levels from before the food was processed. Sometimes, additional complementary nutrients are added, such as vitamin D to milk.

Health Canada defines functional foods as “ordinary food that has components or ingredients added to give it a specific medical or physiological benefit, other than a purely nutritional effect.”

In Japan, all functional foods must meet three established requirements: foods should be

1. Present in their naturally-occurring form, rather than a capsule, tablet, or powder;
2. Consumed in the diet as often as daily; and
3. Should regulate a biological process in hopes of preventing or controlling disease [5, 6, 9].

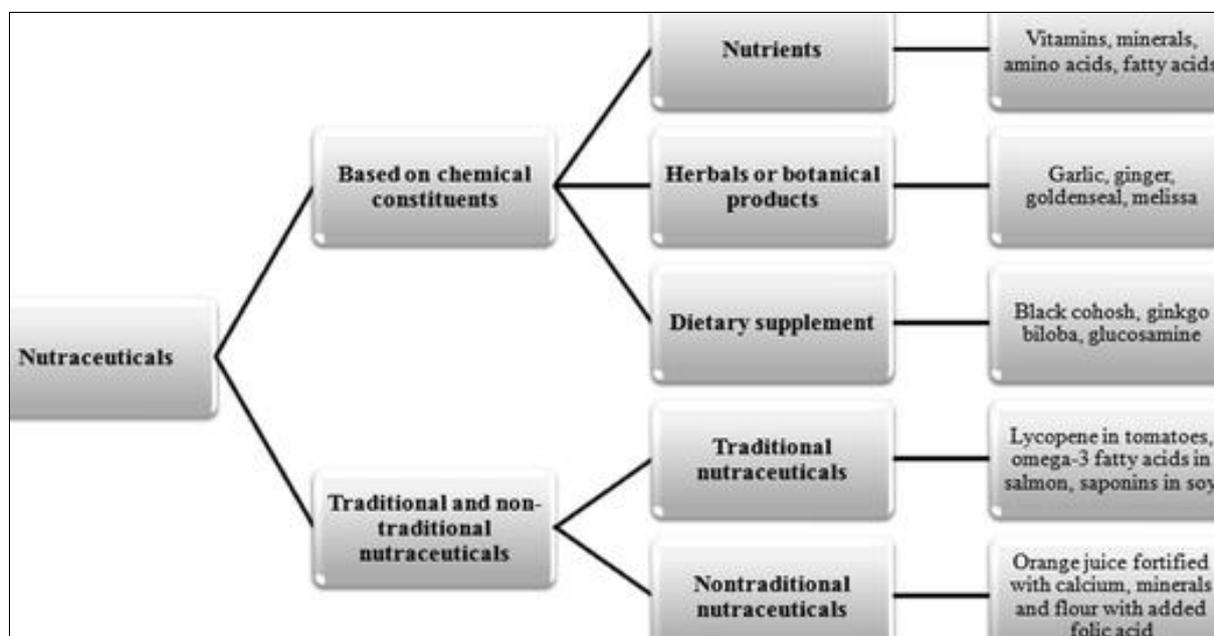


Fig 2: Classification of Nutraceuticals [10]

Medical foods

Medical foods not consider as an over-the-counter product to consumers. The 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 characteristic nutritional requirements, on the basis of recognized scientific principles, are established by medical evaluation.” Nutraceuticals and supplements do not meet these requirements and are not classified as Medical Foods.

Medical foods can be ingested through the mouth or through tube feeding. Medical foods are always designed to meet certain nutritional requirements for people diagnosed with specific illnesses. Medical foods are regulated by the FDA

and will be monitored by medical supervision. Nutraceuticals provide their benefits in a wide range of therapeutic areas such as cough and cold [11], anti-arthritis [12], digestion [13], sleeping disorders [14] and treatment of cancers [15], depression [16], diabetes [17], cholesterol [18], blood pressure [19] and pain killers [20].

Market Scenario of Nutraceuticals

Report, published by Variant Market Research, predict that the global market is expected to reach \$340 billion by 2024 from \$195 billion in 2016; growing at a CAGR of 7.2% from 2016 to 2024. By geography, Asia-Pacific and Rest of the World are expected to grow at a CAGR of 7.6% and 7.7%, respectively, during the forecast period shown in the figure 3 [9].

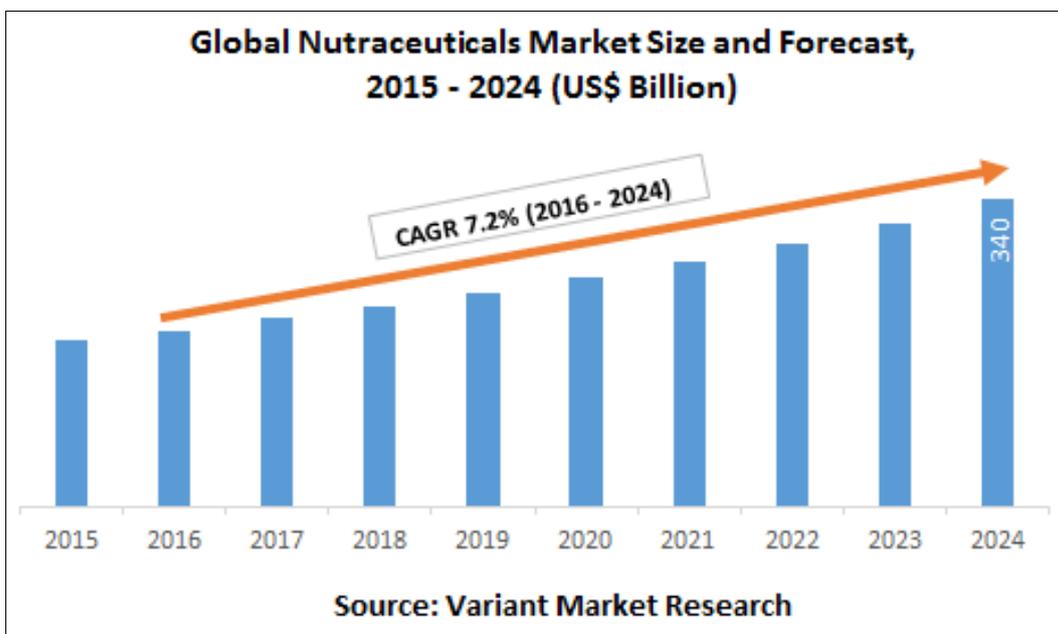


Fig 3: Global Market of Nutraceuticals [21]

Marketed preparation of nutraceuticals

A lot of preparations are available in the market like vitamin nutritional supplements, energy drinks, protein supplements, calcium supplements etc. are available covering almost all

types of preparations that replace allopathic preparation even cosmetic preparations are also available in nutraceuticals as shown in table 1.

Table 1: Shows the marketed nutraceutical, category, ingredients and manufacturer

Marketed Nutraceutical	Category	Ingredients	Manufacturer
Weight smart™	Nutritional supplement	Vitamins and trace elements	Bayer corporation, Morristown, NL, USA
Omega woman	Immune supplement	Antioxidants, vitamins and phytochemicals (eg. Lycopene, and resveratrol)	Wassen, Surrey, U.K.
Rox®	Energy drink	Taurine, caffeine and glucuronolactone	Rox America, Spartanburg, SA, USA
Proteinex®	Protein supplement	Predigested proteins, vitamins, minerals and carbohydrates	Pfizer Ltd., Mumbai, India
Pner plus™	Neuropathic pain supplement	Vitamin and other natural supplement	NeuroHelp, San Antonio, Texas, USA
Mushroom optimizer™	Immune supplement	Mushrooms, polysaccharides and Folic acid	Jarrow formulas, Los Angeles, CA, USA
Chaser™	Hangover supplement	Activated calcium carbonate and vegetable carbon	Living essentials, Walled lake, MI, USA
Calcirol D-3®	Calcium supplement	Calcium and vitamins	Cadilla healthcare limited, Ahmedabad, India.
Appetite Intercept™	Appetite suppressant	Caffeine, tyrosine and Phenylalanine	Natrol, Chatsworth, CA, USA
Betafactor® capsules	Immune supplement	Beta-glucan	Ameriden® international Inc., USA
Tozal Eye Health formula	Improved vision	Omega 3 fatty acids, zinc, antioxidants and lutein	Ameri Sciences, USA
Snapple-a-day™	Meal replacement beverages	Vitamins and minerals	Snapple beverages group, USA
Brainspeed Memory®	Brain health	Blend of vitamins and minerals	Natrol, USA
Red bull®	Energy drink	Taurine, caffeine and Glucuronolactone, b-group vitamins	Austrian red bull GmbH
5-Hour energy®	Energy drink	Vitamins, tyrosin, Taurine, malic acid, caffeine, Glucuronolactone,	Living essentials, USA
WelLife®	Amino acid supplement	Granulated-L-glutamine	Daesang America Inc., Hackensach, NJ, USA

Pediasure®	Nutritional supplement	Protein, vitamin and other natural supplement	Abbott nutrition
Threptin® Diskettes	Protein supplements	Proteins and vitamin B	Raptakos, Brett & Co. Ltd., Mumbai, India
Olivenol™	Dietary supplement	Natural antioxidant, hydroxytyrosol	Cre Agri, Hayward, CA, USA
Beneflora® probiotic	Maintain gastrointestinal health	Lactobacillus acidophilus, bifidobacterium bifidum	Nupro, USA
Ferradol Food® Powder	Nutrition supplement	Carbohydrates, proteins, Niacinamide, calcium, iron, zinc, vitamins	Pfizer Limited, India
Muscle Optimeal®	Meal replacement drink mix	Protein, vitamins, dietary fibres, xylitol and trace elements	Jarrow formulas, USA
Revital®	Daily health supplement	Ginseng, vitamins and minerals	Ranbaxy
becadexamine®	Nutritional supplement	multivitamins	Glaxosmith kiln
Glowelle®	Beauty drink	Antioxidants, vitamins and botanical and fruit extracts	Nestlé

Regulation of Nutraceuticals in India

Regulation of nutraceutical has been focus on safety, efficacy and labeling of neutraceuticals with a lesser prominence on product claims and intended use. This is proficient through Good Manufacturing Practice (GMP) regulations and a recent increase in enforcement. Consumers are largely responsible for determining the usefulness and value offered by nutraceuticals. Still, increased regulation related to quality and safety of these products will benefit the industry on the whole and help alleviate the risk related to neutraceuticals [23].

Regulatory rules in different countries

In the USA, the Food and Drug Administration (FDA) regulates nutraceuticals under a different set of regulations when compared with those covering “conventional” foods and drug products. According to the Dietary Supplement Health and Education Act commencing 1994 (DSHEA), it is the manufacturer's responsibility to ensure that a nutraceutical is safe before it is marketed. FDA is authorized to take action against any unsafe product after it reaches the market. Manufacturers have to make sure that the information on the product label is truthful and not ambiguous, but they are not gratified to neither register their products with the FDA nor get FDA approval before producing or selling nutraceuticals. In the European Union, food legislation is largely under the umbrella of European Food and Safety Authority (EFSA). This legislation focuses on “food supplements”, which are defined as concentrated sources of nutrients (*e.g.* proteins, minerals and vitamins) and other substances with a beneficial nutritional effect. The main EU legislation related to food supplements is Directive 2002/46/EC.

Current status

Nutraceutical food or food components that help in treatment and prevention of diseases are made from natural raw material. This is rapidly growing industry (7-12% per year) with more than millions of people in the world using these natural products. The global nutraceutical market to reach \$ 450 billion by 2015. The Indian consumer's awareness about conventional nutraceutical ingredients is severely limited and nutraceutical manufacture's need to take up the cause and spread awareness about their products to the Indian masses. The global nutraceutical market has seen maximum growth in last decade. In India, beverages and functional food are expected to witness much higher growth rates when compared to dietary supplement over the next five years. In the Asia Pacific nutraceutical product market, Japan represents the largest consumer, followed by China. India's functional food market is forecast to record

moderate growth, with functional foods and beverages forecast to account for almost 71% of the dietary supplement sector in 2017. In Middle East and Africa, dietary supplements represented the fastest growing market segment in the nutraceutical market, recording almost 31% yearly growth between 2007 and 2011. Non-herbals represented the fastest growing segment, while proteins and p presented the fastest growing segment, while proteins and peptides was the most lucrative market segment in 2011. Hungary and Russia forecast to hold just over 20% and just under 24.5% of the nutraceutical market respectively in 2017. Nutraceuticals came into medicinal format such as capsule, tablet or powder in a prescribed dose while modern nutraceuticals are available as forms of food or included in foods or as whole food itself such as pro-biotic drink and yogurt [24-26].

Future perspective

To conclude, nutraceuticals area potentially growing sector and are engaged in both the fields, either medical treatment or nutrition so as to assure integrated medical assistance. These act as potential dietary supplements, prevention of diseases such as CVD, the support and treatment of various types of cancer, and other healthcare benefits. Therefore, nutraceutical industries now understand and perceive extensively about the potential success of nutrients that affect people in healthcare. At present, medical care is assessed to be the domain of drugs. On the contrary, nutrition is only appraised to be a product for healthy living. In the forthcoming years, it is anticipated that work will be performed, as they both interact and complement each other. The implementation of newer technologies such as the application of genetically modified technology in the food industry, nanotechnology-based nutraceuticals, etc., leads to better medical treatment and health care benefits, which further extended the increase in the nutraceuticals revenue market. The scientific research ratifies that the improved safety and potential effects of newly developed nutraceutical products will further stimulate the investments in newer technologies, such as nutrigenomics, converging techniques, varied imaging technologies and its applications in nutrition development and healthcare.

Result and Discussion

In last few years' nutraceuticals market expanded tremendously due to its safety and minimal side effects. In India situation is different due to lack of investment and focus on research and development, imbalance of food provided to the under nourished through government schemes are current challenges. To overcome that challenges we should encourage research in the field of

nutraceuticals by funding, provide R & D infrastructure support to nutraceutical players for conducting research also there should be collaboration between industry and academia and increase public- private partnership. There is need to understand the need of nutraceuticals in modern day life style.

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Conflict of Interest

Author declared no conflict of interest.

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