

Nutraceutical and functional foods-An overview

Rajashri Mundhe

Mundhe R. Nutraceutical and functional foods-An overview. *J Food Drug Res.* 2022;6(2):12-14.

ABSTRACT

In past 20 years more scientific focus has been trained on the identification of Functional, novel and health promoting ingredients from nutraceutical sector, which will be beneficial for human health and useful to boost immunity within the human body. Functional foods are enriched components that may reduce the risk of chronic disease by providing health benefits beyond the traditional nutrients it contains and will help in nourishment and long-lasting benefits to the human body.

Nutraceutical has received considerable attention because of its positive

effects on human body, its nutritive value, therapeutic effects and minimal or no side effects. Nutraceutical with reference to functional food has a major market potential in health-related sector and acting against various diseases and treatments. It has emerged as an alternative to modern medicine maintaining quality of life.

The purpose of this study was to understand the concept of nutraceutical and functional food by reviewing research papers, review paper, journals and Articles from reputed journals and objective was to explore this promising area of nutraceuticals and Functional food category for future exploration for therapeutic benefits of human kind.

Key Words: Nutraceuticals; Functional foods; Nutrient; Diseases and Treatments; Medicine

INTRODUCTION

Nutraceutical is a term coined in 1979 by Stephen De Felice [1]. It is defined "as a food or parts of food that provide medical or health benefits, including the prevention and treatment of disease." Nutraceuticals may range from isolated nutrients, dietary supplements and diets to genetically engineered "designer" foods, herbal products and processed products such as cereals, soups and beverages [2].

Nutraceutical gains major attentions because of its immense advantages over traditional medicines and their presumed safety. Many researches show that diet plays as important role if one wants a good health and immunity.

The whole world is fighting with many diseases like cancer, cardiovascular, diabetes, Alzheimer's etc. hence best nutrition and regular exercise plays an important role in maintaining good health. Nutraceutical promotes the quality of life by maintaining good health and acting against various diseases [3].

Hippocrates, the father of Western medicine, said that people should "Let food be thy medicine."

The search for Natural Bioactive Compounds (NBCs) with potential for the treatment and prevention of human diseases and to meet other needs is currently a key topic in many laboratories and industries. These compounds efficiently interact with proteins, DNA, and other biological molecules to produce a desired outcome, which could be exploited for designing natural products-derived therapeutic agents. Nowadays, there is a marked trend in the food industry toward the development and manufacture of functional products. This new class of food products has seen great success in the market due to the growing of consumer interest for "healthy" food. Hence, pharmaceutical and food domains share a similar interest to obtain and characterize new NBCs which can be used as drugs, functional food ingredients, or nutraceuticals. However, supply limitations from natural sources affect the large-scale use of some of these substances [4].

In Canada, the latter group has now been integrated under a new category as natural health products that promote health. This category includes nutraceuticals and herbal as well as other natural products. In some countries, however, functional foods and nutraceuticals are used interchangeably. Regardless, the main focus of such products is to improve health and reduce disease risk through prevention [5].

Nutraceutical

Dr Stephen and De Felice coined the term "Nutraceutical" from "Nutrition" and "Pharmaceutical" in 1989. When food is being cooked or prepared using "scientific intelligence" with or without knowledge of how or why it is being used, the food is called "functional food." Thus, functional food provides the body with the required number of vitamins, fats, proteins, carbohydrates, etc, needed for its healthy survival.

Nutraceuticals (as per the proposed definition) differ from dietary supplements in the following aspects:

Nutraceuticals must not only supplement the diet but should also aid in the prevention and/or treatment of disease and/or disorder.

Nutraceuticals are represented for use as a conventional food or as the sole item of meal or diet [6].

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 [7]. However, the term nutraceutical as commonly used in marketing has no regulatory definition [8].

Medical definition of Nutraceutical: According to Melissa Conrad Stöppler, MD, Nutraceutical are the food or part of a food that allegedly provides medicinal or health benefits, including the prevention and treatment of disease

A bioactive compound occurring as a food component, additive, or product, including vitamins, dietary fiber, herbal extracts, carotenoids, and probiotics: nutraceuticals are said to promote health and well-being, allegedly helping in the prevention and treatment of disease.

A nutraceutical or 'bioceutical' is a pharmaceutical alternative which claims physiological benefits [9,10].

In the US, "Nutraceuticals" are largely unregulated, as they exist in the same category as dietary supplements and food additives by the FDA, under the authority of the Federal Food, Drug, and Cosmetic Act [11,12].

Nutraceuticals still need support of an extensive scientific study to prove "their effects with reduced side effects" [13,14]. This can be achieved by the enactment of FIM proposed Nutraceutical Research and Education Act

Department of Biotechnology, MGM University, MGM Campus, Aurangabad, Maharashtra, India

Correspondence: Rajashri Mundhe, Department of Biotechnology, MGM University, MGM Campus, N-6, CIDCO, Aurangabad, Maharashtra, India, Phone no +91 7888195141, E-mail rajashrikutte@gmail.com

Received: 31-Jan-2022, Manuscript No. PULJFDR-22-4162; Editor assigned: 03-Feb-2022, PreQC No. PULJFDR-22-4162 (PQ); Reviewed: 25-Feb-2022, QC No. PULJFDR-22-4162 (Q); Revised: 03-Mar-2022, Manuscript No. PULJFDR-22-4162 (R); Published: 19-Mar-2022, DOI:10.37532/puljdr.22.6(2).12-14



This open-access article is distributed under the terms of the Creative Commons Attribution Non-Commercial License (CC BY-NC) (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits reuse, distribution and reproduction of the article, provided that the original work is properly cited and the reuse is restricted to noncommercial purposes. For commercial reuse, contact reprints@pulsus.com

(NREA) [15].

The NREA includes the creation of a Nutraceutical Commission (NUCOM) specifically for the review and approval of nutraceuticals and the creation of a nutraceutical research grants program specifically for clinical research. As per FIM, the key elements of NREA should include a mechanism to create the exclusive rights to claims necessary for private investment in research and development, and the creation of appropriate channels for the review, approval, and regulation of new products and claims. We believe that in so doing the NREA should keep in check the cost of nutraceuticals and thereby assure access for everyone.

The use of nutraceuticals, as an attempt to accomplish desirable therapeutic outcomes with reduced side effects, as compared with other therapeutic agents has met with great monetary success [16,17].

A nutraceutical product may be defined as a substance, which has physiological benefit or provides protection against chronic disease. Nutraceuticals may be used to improve health, delay the aging process, prevent chronic diseases, increase life expectancy, or support the structure or function of the body.

Nutraceuticals range from isolated nutrients, dietary supplements, and specific diets to genetically engineered “designer” food, herbal products, and processed foods such as cereals, soups, and beverages [18]. Nutraceuticals are continuously developed and have quickly spread worldwide [19].

Benefits of nutraceuticals

Nutraceuticals may offer many benefits:

- May increase the health value of our diet
- May help us live longer
- May help us to avoid particular medical conditions
- May have a psychological benefit from doing something for one self
- May be perceived to be more “natural” than traditional medicine and less likely to produce unpleasant side effects
- May present food for populations with special needs (e.g. nutrient-dense foods for the elderly)
- May easily be available and economically affordable [20]

The nutraceutical products are recognized and produce health benefits such as to reduce the risk of cancer and heart disease and also to prevent or treat hypertension, high cholesterol, excessive weight, osteoporosis, diabetes, arthritis, digestive upsets and constipation, not to mention headaches. Nutraceuticals are available in concentrated forms as pills, capsules, powders and tinctures either as a single substance or as combination preparations.

Nutraceutical is a broad term but it is specifically divided into two broad categories (Figure 1).

Functional food

In Canada, a functional food has been defined as being “similar in appearance to conventional foods consumed as part of a usual diet” whereas a nutraceutical is “a product produced from foods but sold in pills, powders, (potions) and other medicinal forms not generally associated with food” [21].

In Britain, the Ministry of Agriculture, Fisheries and Food has developed a definition of a functional food as “a food that has a component incorporated into it to give it a specific medical or physiological benefit, other than purely nutritional benefit” [22].

Functional foods are fortified or enriched during processing and then marketed as providing some benefit to consumers. 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”[23]. In Japan, all functional foods must meet three established requirements: foods should be

- Present in their naturally occurring form, rather than a capsule, tablet, or powder
- Consumed in the diet as often as daily
- Should regulate a biological process in hopes of preventing or controlling disease [24]

Functional foods are similar in appearance to conventional foods; the former being consumed as part of the normal diet. In contrast to conventional foods, functional foods, however, have demonstrated physiological benefits and can reduce the risk of chronic disease beyond basic nutritional functions, including maintenance of gut health [16,17]. When food is being cooked or prepared using “scientific intelligence” with or without knowledge of how or why it is being used, the food is called “functional food”. Thus, functional food provides the body with the required amount of vitamins, fats, proteins, carbohydrates, etc., needed for its healthy survival [25].

Functional foods can be defined as dietary items that, besides providing nutrients and energy, beneficially modulate one or more targeted functions in the body, by enhancing a certain physiological response and /or by reducing the risk of diseases [26].

The conviction to develop functional foods first emerged in Japan in the 1980s when faced with escalating health-care costs. The Ministry of Health and Welfare initiated a regulatory system to approve certain foods with documented health benefits [27]. Its primary objective was to improve the health of the nation’s ageing population. In 1984, the Ministry of Education, Science and Culture, an ad hoc group in Japan commenced a national project to explore the link between food and medical sciences [28]. The term ‘functional food’ first appeared in 1993 in the Nature news magazine under the heading ‘Japan explores the boundary between food and medicine’ [29].

CONCLUSION

Nutraceutical Market is growing and expanding its horizon in different forms. Nutraceuticals provides additional benefits as functional food by preventing various diseases and helps in various treatments as co-prescription. Functional food provides a right amount of nutrients to a body for healthy survival. Natural Nutraceutical ingredients when used in right amount have specific medical or physiological benefit, other than purely nutritional benefits.

Nutraceuticals may offer many health benefits and reduce the risk of many chronic diseases by boosting immune system and providing potential nutritional, safety and therapeutic effects.

There should be more study required to analyse its long-term effect and some clinical study for making people aware about its benefits so that they will take it as their daily routine for prevention of various diseases.

With the ever-changing lifestyle of humans, there will be plenty of opportunities for nutraceutical and functional food sector to launch various products which will help in curing and supporting overall health of human body.

Nutraceuticals have proven health benefits and their consumption will keep diseases at bay and allow humans to maintain an overall good health and healthy life ahead.

REFERENCES

1. Dillard CJ, German JB. Phytochemicals: nutraceuticals and human health. *J Sci Food Agric.* 2000;80:1744-1756.
2. Andlauer W, Fürst P. Nutraceuticals: a piece of history, present status and outlook. *Food Res Int.* 2002;35:171-176.
3. Joana Gil-Chávez G, Villa JA, J Zavala FA et al. Technologies for extraction and production of bioactive compounds to be used as nutraceuticals and food ingredients: an overview. *Compr Rev Food Sci Food Saf.* 2013;12:5-23.
4. Shahidi F. Nutraceuticals, functional foods and dietary supplements in health and disease. *J Food Drug Anal.* 2012;20:226-230.
5. Kalra EK. Nutraceutical-definition and introduction. *Aaps Pharmsci.* 2003;5:27-28.

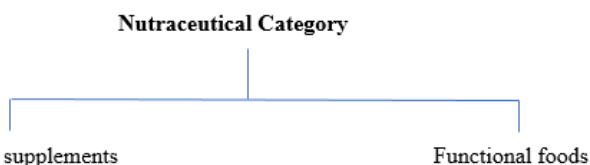


Figure 1) Nutraceutical category of food

6. Zeisel SH. Regulation of Nutraceuticals. *Science*. 1999;285:185-186.
7. Heyland DK. In search of the magic nutraceuticals: problems with current approaches. *J Nutr*. 2001;131:2591S-2595S.
8. Conover EA. Over-the-counter products: nonprescription medications, nutraceuticals, and herbal agents. *Clin Obstet Gynecol*. 2002;45:89-98.
9. Defelice SL. Foundation for innovation in medicine rationale and proposed guidelines for the Nutraceutical Research and Education act. *J Nutraceuticals Funct Med Foods*. 2000;2:43-52.
10. Nelson NJ. Purple carrots, margarine laced with wood pulp? Nutraceuticals move into the supermarket. *J Natl Cancer Inst*. 1999;91:755-757.
11. Whitman M. Understanding the perceived need for complementary and alternative nutraceuticals: lifestyle issues. *Clin J Oncol Nurs*. 2001;5:190-194.
12. Mazza G. Functional foods. *Biochemical and Processing Aspects*. CRC Press; 1998.
13. Childs NM. Nutraceutical industry trends. *J Nutraceuticals Funct Med Foods*. 2000;2:73-85.
14. DeFelice SL. Nutraceuticals: Opportunities in an emerging market. *Scrip Mag*. 1992;9.
15. Cockbill CA. Food law and functional foods. *Br Food J*.1994; 96:3-4.
16. Sarris J, Murphy J, Mischoulon D, et al. Adjunctive nutraceuticals for depression: a systematic review and meta-analyses. *Am J Psychiatry*. 2016;173:575-587.
17. The government of Canada. *Biotechnology. Glossary*. 2006-03-23.
18. Banach M, Patti AM, Giglio R, et al. The role of nutraceuticals in statin intolerant patients. *J Am Coll Cardiol*. 2018;72:96-118.
19. The New York Times. Supplement makers touting cures for alzheimer's and other diseases get F.D.A. warning. 2019.
20. Kumar A, Singh S, Kumar R et al. nutraceutical: a new scope and opportunity of healthcare. *PharTutor J*. 2018.
21. Hardy G. Nutraceuticals and functional foods: introduction and meaning. *Nutr (Burbank Angeles Cty. Calif)* 2000;16:688-689.
22. Food and Agriculture Organization of the United Nations (FAO), authors Report on Functional Foods, Food Quality and Standards Service (AGNS) 2007.
23. Laparra JM, Sanz Y. Interactions of gut microbiota with functional food components and nutraceuticals. *Pharmacol Res*. 2010;61:219-25.
24. Biesalski HK. Nutraceuticals: the link between nutrition and medicine. *Oxidative Stress and Dis*. 2001;15:1-26.
25. Nicoletti M. Nutraceuticals and botanicals: overview and perspectives. *Int J Food Sci Nutr*. 2012;63(sup1):2-6.
26. Arai S. Studies on functional foods in Japan—state of the art. *Biosci Biotechnol Biochem*. 1996;60:9-15.
27. Ohama H, Ikeda H, Moriyama H. Health foods and foods with health claims in Japan.” In *Nutraceutical and functional food regulations in the United States and around the world*. Academic Press. 2008:249-280.
28. Swinbanks D, O'Brien J. Japan explores the boundary between food and medicine. *Nature*. 1993;364:180.
29. Torabally NB, Rahmanpoor HA. Nutraceuticals: Nutritionally Functional Foods –an Overview. *Biomed J Sci Tech Res*. 2019;15:1-3.