



An Overview On Nutraceutical Used As Supplements

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ABSTRACT

In the current script whole population is deeply concerned about their health because of cultures chanced due to increase in working hours which led to increased prevalence of life threatening complaint. As we know that “**Health Is Wealth**”. Our responsibility takes acceptable quantum of nutrients or complete food, nutraceutical and salutary supplements are the product deduced from natural sources which give health benefits that come extensively available over the last two decades. the demand of nutraceutical is not honored only for their health benefits to reduce the threat of cancer, heart complaint and other affiliated affections but also to help hypertension, high cholesterol, inordinate weight, diabetes. Nutraceutical are made from food or part of food; food supplements are single substance used alone or in fusions with the compass of adding micronutrients when the body is in need of them. In this review we added the introduction, examples & uses of nutraceuticals.

KEYWORDS Nutraceuticals, Dietary Supplements, FSSAI, CAGR, DSHEA, Lifestyle, Life Threating Health Benefits.

INTRODUCTION

Nutraceutical is deduced from the word nutrition and medicinal and given by **Stephen De Felice in 1989**. Nutraceutical is a substance considered as food or its corridor provides health benefits, help complaint and promote health (e.g., Ascorbic Acid, Quercetin, Gallic Acid, Etc.) therefore Nutraceutical are food or food constituents give medical benefits and health [1].

Nutraceutical have numerous advantages used as for healthcare benefits as well as salutary supplements. the chemicals ingredients present in Nutraceutical have been used as salutary supplements like (Pyruvate, Chondroitin, Lycopene, Quercetin, etc.) Nutraceuticals is a broad marquee nominated which is used to explain those products which is deduced from food origin with redundant health benefits in addition to the introductory nutritive value attained in foods. Nutraceutical products can be considering as nonspecific natural curatives used to promote health, well- being, control sign, symptoms, and help nasty complaint. Term “nutraceutical” combines from two words of “nutrient,” which is a nutritional food element, and “medicinal,” which are a medicine. description of nutraceuticals and their affiliated products particulars generally depends on the source. These products can be classified on the base of their natural sources, pharmacological conditions, as well as chemical constitution of the products. substantially nutraceuticals are grouped into four orders that include salutary supplements, functional foods, medicinal foods, and Medicinals. Over the once several times, nutraceuticals have attracted considerable interest due to their implicit nutritive, safety, restorative and remedial goods. These products could have a part in a natural process, including antioxidant defenses, cell proliferation, gene expression etc. thus, nutraceuticals are used to ameliorate health, help habitual conditions, avoid the aging process, and in turn increase life expectation, and support the functions and integrity of the body. These products are considered to be healthy sources for the forestallment and treatment of life- hanging conditions similar as hypertension, Parkinson, Alzheimer, diabetes, renal and gastrointestinal diseases, as well as different infections. A broad range of nutraceuticals has been showing the pivotal places in vulnerable status and vulnerability to certain complaint countries. Nutraceuticals also parade complaint- modifying suggestions related to oxidative stress including disinclinations, Alzheimer's complaint, cardiovascular conditions, cancer, eye conditions, Parkinson's conditions, and rotundity.

OPERATION OF NUTRACEUTICAL WITH EXPLICATIONS

1. used in arthritis (Chondroitin, Glucosamine, etc.)
2. used in antidiabetics (Docosahexaenoic Acid, Psyllium, Lipoic Acid, etc.)
3. used in cancer (Lycopene, Capsaicin, Genistein, Limonene, Curcumin, Lutein, etc.)
4. used in cardiovascular (CVS) disease (Flavonoids, Polyphenols, etc.)
5. used in inflammation (Linoleic Acid, EPA, DHA, GLA, Quercetin, etc.)
6. used in antioxidants (CLA, Catechin, Gingerol, Lycopene, Tannins.) [2].

HISTORY OF NUTRACEUTICAL DISCOVERY

Hippocrates (460- 377 BC) the father of ultramodern drug gives the foundation gravestone from his grand statement “**Let food be the drug and drug be the food**”. He encouraged the conception of food can also be the result for the forestallment and treatment of complaint. The gospel behind nutraceuticals is to concentrate on forestallment, control according to the saying by a Greek croaker Hippocrates (known as the father of drug). Their part in mortal nutrition is one of the most important areas of disquisition, with wide- raging counteraccusations for consumers, healthcare providers, controllers, food directors, and distributors.

Roman croaker Galen design and formulate diet authority which would maintain health standard of the population. He stated that carbohydrates, fats, minerals, amino acids are source salutary in health consequences and used to treat malnutrition [3].

CATEGORIZATION OF NUTRACEUTICAL

According to the characteristic of nutraceutical, nutraceutical is classified into the following categories:

1. Nutraceutical According to Their Food Source.
2. Nutraceutical According to Their Mechanism of Action.
3. Nutraceutical According to Their Chemical Nature.

Table No. 1 categorization of nutraceutical based on food source [4]

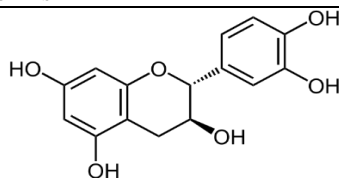
Food source	Examples
Plant	Ascorbic acid, quercetin, luteolin, cellulose, gallic acid, etc.
Animal	Conjugated linoleic acid (CLA), creatine, zinc, selenium
Microbes	<i>Saccharomyces boulardii</i> (yeast), <i>Bifidobacterium</i> , <i>Acidophilus</i>

Table No. 2 categorization of nutraceutical based on mechanism [4]

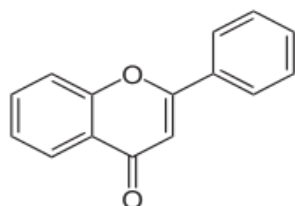
Anticancer	Positive Influence on Blood Lipid Profile	Antioxidant Activity	Anti-inflammatories	Ontogenetic Or Bone Protective
Capsaicin	B-glucan	CLA	Linolenic acid	CLA
Genistein	Tocotrienol	Ascorbic acid	EPA	Soy protein
Daidzein	Tocotrienol	Carotene	DHA	Genistein
Ajoene	Guar	lutein	-	-
Glycyrrhizin	-	-	-	-
Equol, Lutein	-	-	-	-

Table No. 3 categorization of nutraceutical based upon chemical nature [4]

Classes/Component	Source
Catechin	Tea
Flavanones	Citrus
Saponins	Soya bean



1. Catechin



2. flavanones

Salutary supplements are a product taken for healthy diet to give health benefits, especially salutary for malnutrition child. Salutary supplement is designed to round the diet and contain one further nutrient (Vitamin, Amino Acid, Protein, Calcium, Etc.) those are helpful for old age people and child.

Diet refers to the food we consume on daily basis, diet refers to much food consume a healthy person to live healthy.

Beverages means alcoholic and non-alcoholic beverages, drinks and other portable liquids, intended for human consumption, coffee, etc are used as beverage. Nutraceutical are getting recognized for been precious in coronary heart complaint, rotundity, diabetes, cancer, osteoporosis, and other habitual and degenerative complaint like Parkinson's and Alzheimer conditions. The nutrient set up in numerous foods, fruits, and vegetables contribute to the numerous well-known health benefits A salutary supplement represents a product which contains nutrients deduced from food products and is frequently concentrated in liquid, capsule, greasepaint, or lozenge form. Although salutary supplements are regulated by the United States Food and Drug Administration (FDA) as foods, their regulation differs from that which is involved in medicines and other food products. According to their generally accepted description, functional food is those which includes whole foods and fortified, as well as fortified or enhanced dietaries factors that may reduce the threat of habitual and acute complaint and give a health benefit beyond the traditional nutrients it contains. Medical food is formulated to be consumed or administered internally. under the supervision of a registered croaker. Its intended use is specific salutary operation of a complaint or condition for which distinctive nutritive conditions are established by the medical evaluation and on the base of honored scientific principles. Experimenters done an analysis check results from over 4,600 study actors involved with the 2011- 2012 National Health and Nutrition Examination Survey. further than 62 percent of grown-ups reported that they take at least one salutary supplement. People with arthritis, supplement use was most current among those 50 times old age people and aged, on-Hispanic white people, and those with further education, as well as people who had health insurance. Glucosamine with or without chondroitin was the most generally used supplement for common health related to arthritis. While traditional treatment for osteoarthritis generally involves the use of anti-inflammatory drugs, analgesic drugs, surgery, as well as fastening on healthy body weight and regular physical exertion, the nutritive and salutary interventions are a decreasingly popular reciprocal approach — especially among those who prefer non-pharmacologic treatment options [5,6]

table 4. dietary supplements [5,6]

Dietary supplement	Examples
Amino acids	L-arginine
Enzyme	Lactase, papain
Prebiotic and probiotics	Inulin lactobacillus acidophilus Bifidobacterium species yeast
Plant-origin ingredients	Aloe, ginkgo, garlic, green tea extract, ginseng
Other substances	Carnitine, inositol, chitosan, spirulina, lutein

table 5. uses of different dietary supplements [5,6]

Dietary Substances	Benefits	Use As
Natural Lycopene	Reducing Risk of Cervical and Prostate Cancer	Anticancer
Natural Purified Lutein Ester	Dietary Supplements	
Garlic	Prevention Of CVS Disease and Controlling Cholesterol Level	Antilipidemic
Green Tea	Weight Management, Cancer, And Cardiac Disease Prevention	CVS Disease, Anticancer, Anti-Obese
Gymnema, Momordica	Diabetic Control	Antidiabetic
Glucosamine	Arthritis Treatment	Arthritis
Ginkgo Biloba	Allergy Relief	Antiallergy
Ginseng	Immunomodulator	Immune Disorder
Kelp	Improves Sensory Action, Reduce Blood Clot, Control Blood Sugar	Anticoagulant, Antidiabetic
Alfalfa	Control Blood Glucose Level	Antidiabetic
Glucosamine	Pain Reliever	Rheumatoid Arthritis, Osteoarthritis
Creatine	Weight Gain	Muscle Building
EAA	Repair Tissue, Help in Protein Synthesis	Muscle Building
Yohimbe	Erectile Dysfunction	Sexual Disease
Goldenseal	Treat Respiratory Infection, Cold	Cough Suppressant
St. John's Wort	Reduced Stress, Depression	Antidepressant
Kava Kava	Reduce Anxiety	Antianxiety

MAKET, GROWTH, & SCOPE OF PRODUCT AVAILABLE IARKET

presently nutraceutical is gaining significance in global request. Nearly 85 are devoted to minerals and vitamins product while 10 are devoted as anti-oxidants, and rest are devoted as botanical product [7]. India and China are the have a huge request for nutraceutical, U.S.A heads the list of global deals as U.S. bones are long hauls ahead than Indian/ Chinese currency [8]. As per the result of an exploration from Freedonia global request salutary and nutraceutical assiduity set

up to growing annually in excess of 7 to reach U.S.\$ 24 billion in 2015[9]. According to global critic global request for food and drinks was anticipated to reach U.S.\$ 130 billion by 2015[10]. Global business intelligence (GBI) experimenters estimated that the global nutraceutical request around U.S.\$ 180 billion by 2017, after adding at a composite periodic growth rate (CAGR) OF 4.9 FROM 2010-2015[11]. The global nutraceutical request size was valued at USD 382.51 billion in 2019 and is anticipated to expand at a CAGR of 8.3 over the cast period. The global nutraceutical request size is projected to reach USD 722.49 billion by 2027, expanding at a CAGR of 8.3 over the cast period, according to a new report by Grand View Research, Inc. Rising mindfulness regarding calorie reduction and weight loss in countries, including U.S., China, and India, is anticipated to promote the operation of nutraceuticals, which, in turn, will have a substantial impact on the assiduity growth. Maturity of the world people is concentrated towards conservation of proper health and in this environment, nutraceutical play a major part [12]. guests show keen interest in different types of nutraceuticals for relieving stress, boosting energy, internal alertness [13].

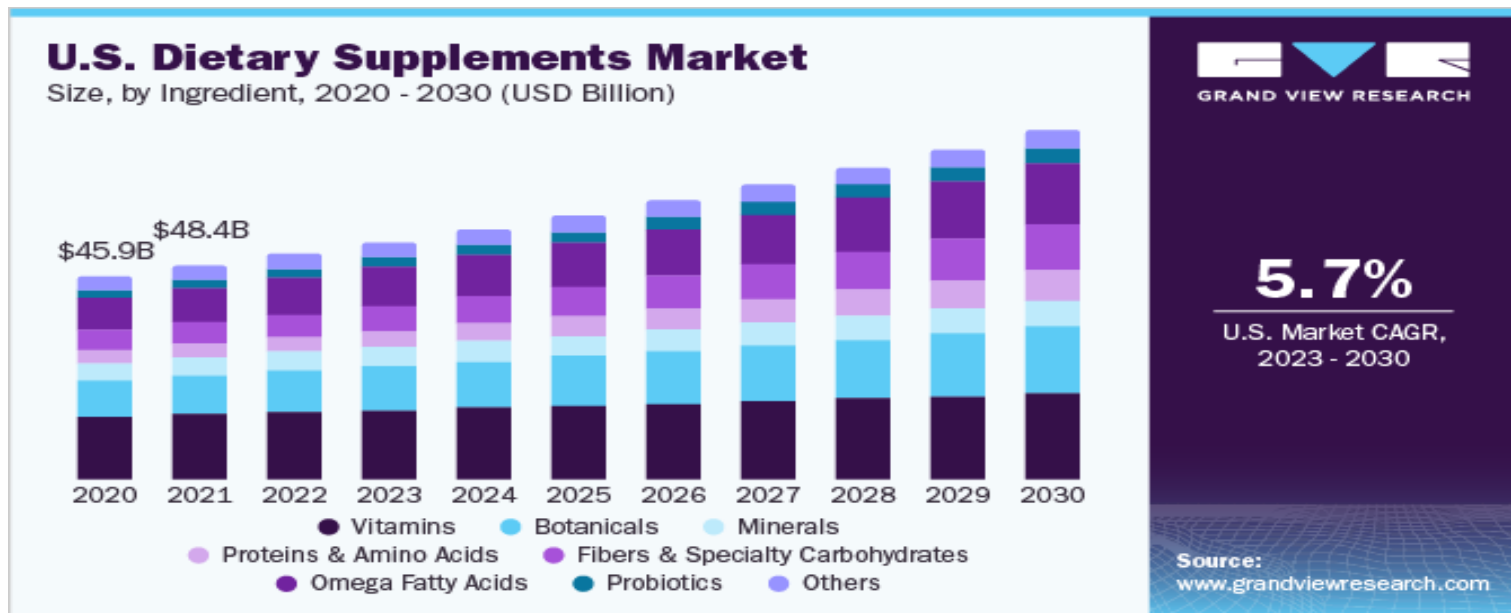


Fig1. U.S. Dietary Supplements Market Size, By Product, 2020-2030 (USD Billion)

Table 6. some popular nutraceutical in the global market is listed above [14-17]

S. No	Product Name	Category	Use	Company Name
1.	Omega women	Antioxidant	Immune supplements	Wasson, U. K
2.	Calcirol-D	Calcium and vitamin	Calcium supplements	Cedilla healthcare limited, Ahmedabad, India
3.	Proteinex	Predigested protein	Protein supplements	Pfizer limited
4.	Revital	Vitamins and mineral	Daily health supplements	Ranbaxy lab limited
5.	WelLife	Granulated l-glutamine	Amino acid supplements	Daesang America Inc, Hackensach, Nj, USA
6.	Coral calcium	Calcium and trace element	Calcium supplements	Natures answer, Hauppauge, Ny, USA
7.	Brain speed memory	Vitamins and mineral	Improve brain health	Natrol, USA
8.	Ferradol food powder	Carbohydrate	Nutritional supplements for adult and children	Pfizer limited, India
9.	olivenite	Natural antioxidant	Dietary supplements	Cre Agri, hayward, ca, USA

REGULATION OF SALUTARY SUPPLEMENTS IN INDIA

We must originally register with the food safety and standard authority of India to vend salutary products in India (FSSAI) f for register and number of ways handed by FSSAI which have been followed. The purpose of public safety, all enrollment procedure must be followed before vended of product, numerous forms similar as FORM A and FORM B, must be completed and approved [18- 22].

The food safety and standard authority of India (FSSAI) under the food safety and security act is main controller for manufacturing, storehouse distribution, deals, import, import, and quality conservation of nutraceutical in order to make them safer for mortal consumption and use. In U.S., nutraceutical is regulated

by salutary supplements health and education (DSHEA) covered by food and medicine administration FDA intervention is directed to conform safety of the dietary supplements but entry of product doesn't warrant FDA approval or registration [23].

CONCLUSION

The age is just a number, but according to the age the defense mechanism of our body becomes weak, it increases risk of age-related disorder. Nutraceutical is natural product contain different ingredient which can prevent different disease and provide health benefits to the population. Continuous researchers focus on nutraceutical to get more and more success in therapy and treatment. The nutraceutical industry is continuing growing faster and faster in food as well as pharmaceutical industries and beverages. Future development of nutraceutical product gives better outcome to fight against deadly disease, nutraceutical and their dietary supplements provide all the essentials element that should be essentials for healthy life of global population. People must change their mindset and adopt to take a new style of healthy living and taking food to make a new concept "Health for All".

REFERENCES

1. Kalra Ek (2003) Nutraceutical-definition and introduction. *Aaps pharmasci*,5;27-28.
2. Prajapati, Vishal, Rahul giri Goswami, Pratik Makvana, And Jitendra Kumar Badjatya." *Int J Drug Regul Aff* 1 (2014): 1-11.
3. Andlauer W, Fürst P (2002) Nutraceutical A piece of history, present status, and outlook. *Food Research international* 35:171-176.
4. SD Ehrlich (2008) Private practice specializing in complementary and alternative medicine, review, verimed healthcare network, Phoenix, AZ, USA.
5. Nasri, Hamid, Azhar Baradaran, Hedayatollah Shirzad, And Mahmoud Rafieian-Kopaei," *New Concept in Nutraceutical as Alternative for Pharmaceutical*" *Int J Prev Med* 12 (2012):1487.
6. Food And Drug Administration. "Guidance Documents & Regulatory Information by Topic (Food and Dietary Supplements)." (2019).
7. Semba RD (2012) The discovery of the vitamins. *Int J Vitam Nutr* 82: 310-5.
8. Srivastava S, Sharma P. Guru Kumara S (2015) Nutraceutical: A Review *J Cronother Drug Deliv* 6:1-10.
9. Das L Bhaunik E, Raychauhadhari U, Chakarborthy R (2012) Role of Nutraceuticals in Human Health *J Food Sci Technol* 2:173-83.
10. Parasuram RR (2011) Nutraceutical an area of tremendous scop *Int J Res Ayurveda Pharm* 2: 410-415.
11. Verma B, Popli H (2018) regulation of nutraceutical in India & us 7: 811-816.
12. Petrovska BB (2012) Historical review of medicinal plants' usage *Pharmacogn Rev* 11: 1-5.
13. 13) van der Zanden Lotte DT, van Kleef E, de Wijk Rene A, van Trijp Hans CM (2014) Knowledge, perception, and preferences of elderly regarding protein-enriched functional food appetite 80:16–22.
14. Parasuram RR (2011) nutraceutical: an area of tremendous scop *Int J Res Ayurveda Pharm* 2: 410-415.
15. Zeisel SH (1999) regulation of "Nutraceutical" *Science Reg Anesth Pain Med* 37: 188-192.
16. Petrovska BB (2012) Historical review of medicinal plants' usage *Pharmacogn Rev* 11: 1-5.
17. St. auffer JE (1999) nutraceutical cereal food world 68:149-153.
18. "U.S. Food and Drug Administration." *USFDA* (2021).
19. "Regulations.gov". (2013).
20. Prajapati, vishal, rahulgiri goswami, Pratik, and Jitendra Kumar badjatya." *Int J drug regul AFF1*(2014) 1-11.
21. Nasri, Hamid, Azhar Baradaran, Hedayotollah Shirzad, And Mahmoud Rafieian-Kopaei," *New Concept in Nutraceutical as Alternative for Pharmaceutical J Prev Med* 12 (2012):1487.
22. Food and Drug Administration. "Guidance documents & regulatory information by topic (food and dietary supplements)." (2019).
23. Verma B, popli H (2018) regulations of nutraceutical in India and US 7: 811-816.