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HEALTHY LIVING WITH NUTRACEUTICALS

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ABSTRACT
Now a day every person wants to live the healthy life. Synthetic medicines are having some certain drawbacks. So nutraceuticals will definitely play promising and unique way of safer medicines. Nature is one of the most important resources of human foods and medicines. Rapidly increasing knowledge on nutrition, medicine, and plant has fortunately changed the concepts about food, health and, brought in a revolution on them. Nutritional therapy and phototherapy have emerged as new concepts of safer medicine. These systems have quickly and widely spread in recent years. Strong recommendations for consumption of nutraceuticals, natural plant foods, and the use of nutritional therapy and phototherapy have become progressively popular to improve health, and to prevent and treat diseases. Nutraceuticals used in various diseases, Alzheimer's disease, cardiovascular disease, obesity, cancer**,** eye cycle, diabetes. The use of the dietary fiber, omega 3 fatty acid, antioxidant, probiotic, for the better human life possible. This review attempts to display and remark on these aspects. It summarizes the progress made on nutraceuticals, utritional therapy, health benefits, regulation and their promising approach. It also covers development stages of nutraceuticals.
Keywords: Health Management; Nutritional therapy; Omega 3 fatty acid; Probiotics

INTRODUCTION

What is a nutraceuticals? This word—with "nutra" derived from nutrition and "ceutical" from pharmaceutical—refers to substances that may be considered a food or part of a food and may provide medical and health benefits[1]. Nutraceutical is a term coined to describe substances which are not traditionally recognized nutrients but which have positive physiological effects on the human body. Risk of toxicity or adverse effect of drugs led us to consider safer nutraceutical and functional food based approaches for the health management. This resulted in a world wide nutraceuticals revolution. The nutraceuticals revolution will lead us into a new era of medicine and health, in which the food industry will become a research, oriented one similar to the pharmaceutical industry. The safer and chief medicine is need of society and in country like India, China which are having wide diversity; it can be beneficial for them. The constantly increasing demand for nutraceuticals is equally paralleled by a more pronounced request for natural ingredients and health-promoting foods. The multiple functional properties of cactus pear fit well this trend. Safety, potency, and efficacy of these are higher requirement. Recent data revealed the high content of some chemical constituents, which can give added value to this fruit on a nutritional and technological functionality basis. High levels of betalains, taurine, calcium, magnesium, and antioxidants are noteworthy. The concept of nutraceuticals was stared from the survey in UK, Germany and France which concluded that diet is rated more highly by consumers than exercise or hereditary factors for achieving good health.

History

The term nutraceuticals coined in 1989 by Stephen DeFelice. Obtaining adequate nutrients from various foods plays a vital role in maintaining normal function of the human body. With recent advances in medical and nutrition sciences, natural products and health-promoting foods have received extensive attention from both health professionals and the common population. New concepts have appeared with this trend, such as nutraceuticals nutritional therapy, phytonutrients, and phytotherapy[2-4]. The original idea in these concepts goes back three thousand years ago. Hippocrates (460–377 BC), the well-recognized father of modern medicine, stated "Let food be thy medicine and medicine be m thy food" to predict the relationship between appropriate foods for health and their therapeutic benefits[4]. The truth in this saying is widely recognized today.

NUTRITIONAL THERAPY

The health benefits are primarily in several areas, including cancer, atherosclerosis and other cardiovascular disease (CVD), the aging process and immune response enhancing effect, diabetes and mental health. The effects rendered by nutraceuticals and functional foods are due to of photochemical and bioactive present in the products of interest. Thus phytates, phenolic acids, flavonoids/isoflavonoids, coumarins, lignans, carotenoids, terpenes, enzyme inhibitors, and saponins are present in soybean. Phenolic compounds function as antibiotics, natural pesticides, signalling substances for the establishment of symbiosis with rhizobia, attractants for pollinators, protective agents against UV light, insulating materials to make cell walls impermeable to gas and water, and structural material to give plants stability The mechanism by which anti carcinogenic effects of photochemical in plant foods are rendered are varied but generally include one or a combination of possibilities: antioxidant effect, effect on cell differentiation, increased activity of enzymes that detoxify carcinogens, inhibition of N-nitrosamine formation, change of estrogen metabolism, change of colonic milieu, preservation of integrity of intracellular matrices, effect on DNA ethylation, maintenance of DNA repair, increase in apoptosis of cancer cells and decrease in cell proliferation[5].

Common Nutrients and their associated Health Benefits

Table 1: Fat Soluble Vitamins[6]

Sr.No.	Fat soluble Vitamins	Uses
1	Vitamin A	Antioxidant, essential, for growth and development maintains healthy vision, skin and mucous membranes, may aid in the prevention and treatment of certain cancers and in the treatment of certain skin disorders
2	Vitamin D	Essential for formation of bones and teeth, helps the body absorb and use calcium.
3	Vitamin E	Antioxidant, helps form blood cells, muscles, lung and nerve tissue, boosts the immune system
4	Vitamin K	Essential for blood clotting

Table 2: Water Soluble Vitamins

Sr. No.	Water Soluble Vitamins	Uses
1	Vitamin C	Antioxidant, necessary for healthy bones, gums, teeth and skin, helps in wound healing, may.
2	Vitamin B1	Helps to convert food in to energy, essential in neurologic functions.
3	Vitamin B2	Helps in energy production and other chemical processes in the body, helps maintain healthy eyes, skin and nerve function.
4	Vitamin B3	Helps to convert food in to energy and maintain proper brain function.
5	Vitamin B6	Helps to produce essential proteins and convert protein in to energy.
6	Vitamin B12	Helps to produce the genetic material of cells, helps with formation of red blood.

Table 3: Trace Elements & Another Nutrients

Sr. No.	Trace elements	Uses
1	Chromium (Cr)	With insulin helps to convert carbohydrates and fats into energy
2	Cobalt (Co)	Essential component of vitamin B12, but ingested cobalt is metabolized *in vivo* to form the B12 coenzymes
3	Copper (Cu)	Essential for hemoglobin and collagen production, healthy functioning of the heart, energy production, absorption of iron from digestive tract
4	Iodine (I)	Essential for proper functioning of the thyroid
5	Selenium (Se)	Antioxidant, essential for healthy functioning of the heart muscle
6	Zinc (Zn)	Essential for cell reproduction, normal growth and development in children, wound healing, production of sperm and testosterone Vitamin like compounds
7	Biotin	Required for various metabolic functions
8	L- Carnitine	Oxidation of fatty acids, promotion of certain organic acid excretion and enhancement of the rate of oxidative phosphorylation
9	Choline Lipotropic agent	Used to treat fatty liver and disturbed fat metabolism
10	Vitamin F	Involved in proper development of various membranes and synthesis of prostaglandins, leukotrienes and various hydroxy fatty acids
11	Inositol Lipotropic agent	Necessary for amino acid transport and movement of potassium and sodium
12	Taurine Aids	Aids in retinal photoreceptor activity, bile acid conjugation, white blood cell antioxidant activity
13	CNS neuromodulation	Platelet aggregation, cardiac contractility, sperm motility, growth and insulin activity

CLASSIFICATION OF NUTRACEUTICALS

The classification of the nutraceuticals is having wide significance in health industry.

According to classification categories and multidimensional uses are easier study understand regarding the promise of nutraceuticals, they should be considered in two ways: • Potential nutraceuticals • Established nutraceuticals A potential nutraceuticals is having promising approach towards the particular health or medical benefit; such a potential nutraceuticals only becomes an established one after there are sufficient clinical data to demonstrate such a benefit. It is disappointing to note that the overwhelming majority of nutraceuticals products are in the 'potential' category, waiting to become established[7]. The food products used as nutraceuticals are categorized as[8].

1. Dietary fiber
2. Omega 3 fatty acid
3. Antioxidants
4. Probiotics

1 .Dietary Fibers

Dietary fibers are used in health food products for normalization of intestinal transit time. They have dual effect on intestinal transit. First effect is on the bulk faces, which are often increased, in substantial proportion (127% after ingestion of 20 g of wheat bran, this action with insoluble fibers. The other effect if dietary fibers are upon the duration of transit, which gets normalize.

2. Polyunsaturated Fatty Acids (Omega 3 fatty acid)

Essential fatty acids are required for normal growth and development of our body. Body is unable to produce it. Omega- 3 fatty acids belong to this class. Long chain omega-3 fatty acids such as eicosapentaoic acid and docosagexanoic acids are built up in algae and plankton and the fish living on them. The natural vegetable oils and marine animal oils containing olyunsaturated fatty acid belong to Linoleic group (omega 6-type and omega 3-fatty acid) help to reduce cholesterol formation/deposition and prevent thromboxane formation. e.g. safflower oil, corn oil, soybean oil, mustard oil and marine fishes[9]. Evening primrose oil, flax oil, hemp seed, borage seed[10]. The following are diseases for whichpolyunsaturated fatty acids are preferred. Heart disease and stroke, rheumatoid arthritis, inflammatory rthritis,
inflammatory bowel disease, asthma, cancer, chronic lung failure, kidney transplant[12].

3. Antioxidants

Antioxidants are power full electron donors and react with free radical damage the biomolecules. The formed antioxidant radical is stable and unreactive. Antioxidants are used to prevent the damage at the cellular level. They may reduce the energy of the free radical preventive suppress radical formation, Repair damage and reconstitute membranes. Antioxidants are very important in the treatment of virtually all diseases because most chronic diseases carry with them a great deal of oxidative stress. Oxidative stress plays major role in neurodegenerative diseases such as Alzheimer's disease (AD), Parkinson's disease (PD), Huntington's disease (HD), and amyotrophic lateral sclerosis (ALS). Oxidative stress is accelerated by the aging process and also by a lack of dietary antioxidants. So this whole myth of if you eat well you don't need to take supplements that just doesn't fly as we are exposed to so many things that accelerate oxidative stress. A large number of studies have found an association between high dietary antioxidant intake and a decreased risk of AD. And that is very important because preventing a disease is significantly easier than treating it. So prevention is key and research suggests that preventing AD is actually not that difficult. 80% of children and 68% of adults do not eat a single fruit or vegetable each day. Not one. Forget about five. They are not even eating one. So you can start to get an idea from a dietary perspective as to why AD is on the rise. It is on the rise because of the environment, and it's also on the rise because of how and what we are eating.

4. Probiotics

Probiotics are live microbial food ingredients, which are beneficial to health. The prerequisite for probiotic action include survival in and adhesion to specific areas of the gastrointestinal tract and competitive exclusion of pathogens or harmful antigens. Probiotics are situated as health or functional foods whereby they are ingested for their purported positive advantages in the digested tract and/or systemic area like the liver, brain, vagina or blood stream. Colon is the most densely populated region of the gastrointestinal tract and harbors an estimated 500 different bacterial species[11-13]. The probiotic bacterial species are having various types with their features. These are Lactobacillus reuteri, Lactobacillus rhamnosus, Lactobacilli, Lactobacillus case, Bifidobacterium longum. Bifidobacterium lactis, Bifidobacterium. The Bacteria is have the features such as they should be safe and able promote good

digestion; they are having the ability to produce the antimicrobial substances. The vitro resistance to pancreatic juice and hydrochloric acid. They are having the potential to fight against the bad bacteria which are adhering to gut wall. Alter the intestinal micro flora balance, boost immune function and increase resistance to infection, inhibit growth of harmful bacteria. Probiotic are help to increase the immunity and compete for nutrients[11-13].

A draft law reminiscent of the Dietary Supplement Health and Education Act is in development in India to regulate manufacturing, importing and marketing of health foods/dietary supplements and other nutraceuticals. Also the country's central drug control department has put some structures in place for dietary supplements, but it is taking a long time for states to cooperate and some states have rejected the structures when their own rules and regulations conflict. Also a new independent association has been formed in India to address some of these issues. The Indian Health and Dietary Supplement Association was created to represent pharmaceutical, nutraceutical, herbal, direct selling and other service oriented industry companies and plans to affiliate with the International Alliance of Dietary Supplement Associations in the near future. The association is planning a scientific conference to bring the industry and government together to share information, experience and perspectives on the use and regulation of dietary supplements.

Developments in Nutraceuticals

Therapeutic Activity of Various Herbs[14]

Sr. No.	Herbs	Therapeutic activity
1	Aloe vera (*Aloe vera* L. N.L. Burm)	Dilates capillaries, anti-inflammatory, emollient, wound healing properties
2	Chamomile (*Matricaria recutita* L.)	Antiinflammatory, spasmolytic, antimicrobial, wound healing
3	Echinacea (*Echinacea purpurea* L)	Immunostimulant, treatment of cold and flu symptoms.
4	Ephedra (*Ephedra sinica* Stapf)	Bronchodilator, vasoconstrictor, reduces bronchial edema, appetite suppressant
5	Garlic (*Allium sativum* L)	Antibacterial, antifungal, antithrombotic, hypotensive,fibrinolytic,antihyperlipidemic
6	Ginger (*Zingiber officinale Rosc*)	Carminative, antiemetic, cholagogue, positive inotropic, treatment of dizziness
7	Ginkgo (*Ginkgo biloba* L)	Vasodilation, increased peripheral blood flow
8	Licorice (*Glycyrrhiza glabra* L., *G.uralensis* Fisch	Expectorant, secretolytic, treatment of peptic ulcer
9	Willow bark (*Salix alba* L)	Antiinflammatory, analgesic, antipyretic, astringent
10	Melissa (*Melissa officinalis* L)	Topical antibacterial and antiviral

Regulations

The governmental administration of food and drugs in many countries such as the United States of America (http://www.cfsan.fda.gov/list.html), Canada (http://www. hcsc. gc.ca/index_e.html), European Union (http://www.emea.eu.int), China (http://www.sfda.gov.cn/cmsweb/web portal), and India (http://mohfw.nic.in/), have strict regulations on food and drugs in terms of manufacturing, servicing, and marketing, and usage[15-18]. The greatest challenge for the nutraceuticals sector remains in the public policy and regulatory areas, which will encourage research and development.

CONCLUSION

Nutraceuticals may be beneficial to our health, but we are still learning about their benefits and possible harmful effects. However there is lack of proper regulation for their production and marketing, which may reduce exploiting nutraceuticals. Hence there is a chance for budding industries to develop core competency in this emerging arena. Although nutraceuticals have significant promise in the promotion of human health and disease prevention, health professional, nutritionists and regulatory toxicologist should strategically work together to plan appropriate regulation to provide the ultimate health and therapeutic benefit to mankind.

Future Prospective of Nutraceuticals

In tomorrow's market, the most successful nutraceuticals companies are likely to be those companies in which functional product are just a part of a broad line of goods satisfying both conventional and health value point. Future demand of nutraceutical depends on consumer perception of the relationship between diet and disease. Although nutraceuticals have significant promise in the promotion of human health and disease prevention, health professional. Consumer today are more aware when it come to health, which makes them go for nutritional supplements. Developing countries like India, where malnutrition is present even in the 21st century and these nutritionally enhanced foods will act as a born for our future generations. The expanding nutraceuticals market indicates that end users are seeking minimally processed food with extra nutritional benefits and organoleptic value. This development, in turn, is propelling expansion in the nutraceuticals market globally. The emerging nutraceuticals industry seems destined to occupy the landscape in the new millennium. Its tremendous growth has implications for the food, pharmaceutical, healthcare, and agricultural industries. For diseases expected to increase in number, but can be prevented by lifestyle change, such as metabolic syndromes, the patients are required to positively change their lifestyles. One of the solutions is to change their diet. Nutraceuticals should contribute to prevention of such diseases. Establishment of scientific assessment standard for prevention of diseases, establishment of assessment system for disease prevention by human trials and establishment of seamless system to transfer stage from basic research to industrialization. The following research strategy of the world towards nutraceuticals should be in future for living life healthy and improve quality of life.

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