



Research Paper

**A CONCEPTUAL STUDY ON NUTRACEUTICALS IN AYURVEDIC
PERSPECTIVES W.S.R. TO RASAYANA**

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Abstract

Presently population is gradually suffering from many metabolic and degenerative diseases, which are primarily caused by nutritional deficiency. There are many nutritional supplements on the market which are specially designed for these deficiencies. In recent years a pharmaceutical product “Nutraceuticals” has made a special attention among health professionals and people for their nutritional supplementation. Any substance as a food or its part with normal nutritional value provides health benefits including the prevention of the disease or promotion of health is called Nutraceuticals. It can provide substantial health benefits especially in the prevention and treatment of acute and chronic diseases. Nutraceutical term is quite new for modern world but its roots and concept are already available in Ayurveda. There are much more considerations about diet are described in Ayurveda. Food has been used as a dietary supplement as well as a therapeutic agent from its primitive time. The benefits of food for therapeutic purpose and concept of Rasayana for improving quality of life are novel approaches of Ayurveda. Rasayana acts as micronutrient which nourishes our body and improves the immunity of the body and keeps us healthy. The present review study aims to correlate and describe the nutraceutical and Ayurveda.

Key words: Nutraceuticals, Dietary supplements, Ayurveda, Rasayana.

INTRODUCTION

Human lifestyles have been drastically changing over last five decades due to urbanization, industrialization, hectic schedule and changing cultures. These factors have changed human habits and force them to fast eating, instant and tasty food, fast food, junk foods. These habits have directly affected our nutritional aspect of food and gradually decreased the quantity and quality of nutrients. Due to these altered dietary habits population have increased the incidence of immune dysfunctions, metabolic disorders and degenerative diseases. In recent years people are getting consciousness

about their health and deeply concerned about the management of health. In last two decades, revolution in medicine, phytomedicine, nutritional science, food industry and health care have promoted extensive attention in health professionals and the public. Major recent advancement has done in nutraceuticals, food products and phytonutrients. It is a great concept designed by pharmaceutical companies for wellness and prevention and treatment of disease. Ayurvedic therapeutic principles directly depend on wholesome *Aahar* and *Vihaar*. *Aahar* has been considered as food as well as primitive medicine. The concept of *Rasayana* (Rejuvenation therapy) is a broad concept in Ayurveda and more than today's nutraceuticals.

Aims and Objectives:

The present study aims to validate the nutraceutical aspect in Ayurveda. It explains the Ayurvedic perspective of nutraceuticals and provides details about the *Rasayana*. The study also correlates and discusses nutraceuticals and *Rasayana*.

MATERIALS AND METHODS:

Review of all literature regarding *Rasayana* and nutraceuticals started from classical text to all available scientific publications. All the data have been compiled analyzed and discussed the Ayurvedic approach and nutraceuticals.

Nutraceutical:

Nutraceutical is any nontoxic food component which has been used for the improvement of health including prevention and treatment of disease. The term "nutraceutical" was coined from "nutrition" and "pharmaceutical" in 1989 by Stephen De Feliceⁱ. According to him, a nutraceutical is a food or part of food that provides medical or health benefits including the prevention and treatment of diseases. Nutraceuticals may range from isolated nutrients, herbal products, dietary supplements, genetically improved foods, processed food products. Generally nutraceutical contains vitamins, lipids, protein, carbohydrates, minerals and other necessary nutrients. These are marketed in concentrated forms as pills, capsules, powders and extracts in a single compound or in combined form. Hippocrates known as the father of medicine accepted that food is a medicine. Ayurveda has already stated that food is the greatest medicineⁱⁱ. Vitamins and minerals supplements contain isolated nutrients or a combination of nutrients. Nutraceutical supplements contain the compounds that are actually extracted from the whole foods. After extraction, they are concentrated and turned into pills or capsulesⁱⁱⁱ.

Classification of Nutraceuticals:

Nutraceutical is a broad term. There are multiple different types of products that fall under the category of nutraceuticals^{iv}-

1. Dietary supplements
2. Functional foods
3. Farmaceuticals
4. Medical foods

1. **Dietary supplement:** A dietary supplement is a product that contains dietary nutrients derived from food products are intended to add further nutritional value to the diet. These are concentrated in liquid, capsule, pills and tablet form. It covers the following nutraceutical products^v.

a) Nutrients: Substances such as vitamins, minerals, amino acids, fatty acids and antioxidants are dietary ingredients. Vitamins play an important role in metabolism and

enzyme systems. Minerals are important for immunity, reproduction and growth. Fatty acids are responsible for healthy cell membranes, skin and hairs and proper functioning of nervous system, immune system and hormones. Antioxidants prevent cellular damage and aging^{vi}.

b) Herbals: Nutraceuticals holds a great promise to improve health and prevent chronic diseases with the help of herbals. Some examples are flax seed oil and powder contains omega-3 fatty acid which is anti-inflammatory, analgesic, antipyretic, astringent and anti-arthritis^{vii}.

c) Phytochemicals: Phytochemicals are secondary metabolites and also act as nutraceuticals. These are non-nutritive plant chemicals that have either defensive or disease protective properties. Chief phytochemicals are polyphenols, isoflavonoids, anthocyanidins, phytoestrogens, terpenoids, carotenoids, limonoids, phytosterols, glucosinolates, and polysaccharides. Dietary intake of phytochemicals may promote health benefits, protecting against chronic degenerative disorders such as cancers, coronary heart disease, diabetes, high blood pressure, inflammation, microbial, viral and parasitic infections, psychotic diseases, spasmodic conditions, ulcers, osteoporosis and associated disorders. Majority of foods, such as whole grains, beans, fruits, vegetables and herbs contain phytonutrients/ phytochemicals^{viii}. For example, Carotenoids (Isoprenoids) found in various fruits, vegetables and egg yolk, are anti-carcinogenic, boost immune cells and protect cornea against UV light^{ix}.

d) Probiotics: These are live microbial feed supplement for improving its intestinal microbial balance^x. Specific probiotics are used to treat lactose intolerance, acute diarrhea and antibiotic-associated gastrointestinal side effects They help the production of the specific enzyme (β -galactosidase) that hydrolyze the offending lactose into its component sugars^{xi}. Lactobacillus bacteria and bifidobacteria are most important and probiotics.

e) Prebiotics: Prebiotics are nutraceuticals which promote the flourishing of Probiotics. These are the dietary ingredients that affect the host by selectively altering the composition or metabolism of gut flora. These are short-chain fructo-oligosaccharides that have unique chemical structures that are not digested by humans. The prebiotics consumption generally promotes the lactobacillus and bacterial growth in the gut which helps in metabolism. It is beneficial in improving lactose tolerance, detoxification, and dyslipidemia, relief from constipation and in certain tumors^{xii}. Inulin is prebiotic that has been widely used in processed foods^{xiii}. Prebiotics are commercially extracted and concentrated from fruits and vegetables through the hydrolysis of polysaccharides from dietary fibers or starch, or through enzymatic generation. Some sources of prebiotics are chicory roots, onion, garlic, banana, tomato, alliums, and beans^{xiv}.

e) Nutraceutical Enzymes: Enzymes are an essential part of the body which is responsible for many biological functions. Enzyme supplements to diet eliminate many symptoms of hypoglycemia, hyperglycemia, digestive problems and obesity^{xv}.

f) Dietary Fibers: Dietary fibers are the edible plant material that is not hydrolyzed by enzymes of digestive tract but digested by the microflora of gut. Dietary fiber includes non-starchy polysaccharides such as cellulose, hemicelluloses, gum and pectin, lignin and resistant dextrins. The soluble components of dietary fibers have bulking and viscosity producing capabilities which retard the gastric emptying of the stomach. This affects the rate of digestion and uptake of nutrients and feeling of satiety. It lowers the LDL and improves glucose tolerance^{xvi}.

2. Functional food/ Fortified nutraceutical:

Functional food is ordinary food in which components or ingredients added to give it for a specific medical or physiological benefit, other than purely nutritional effect^{xvii-xviii}. The concept of functional food first-ever introduced by Japan in 1991. When functional food aid in prevention or treatment of disease but disorders other than anemia is called as nutraceuticals^{xix}. It constitutes fortified food from added nutrients or ingredients. For examples- Milk enriched with Vit. D, Orange juice fortified with calcium, Cereals flour added with fiber and folic acid^{xx}.

3. Farmaceuticals/ Recombinant nutraceuticals:

Farmaceuticals is made of two words Farm and Pharmaceuticals. The term Farmaceuticals is more frequently associated in agricultural circles, with medical applications of genetically engineered crops or animals. Energy-providing foods, such as bread, alcohol, fermented starch, yogurt, cheese, vinegar and others are produced with the help of biotechnology. The production of probiotics and the extraction of bioactive components by enzyme/fermentation technologies as well as genetic engineering technology are achieved through biotechnology^{xxi}.

4. Medical food:

The medical foods are formulated to be consumed or administered internally under the supervision of a physician, and which is intended for the specific dietary management of a specific disease or conditions for which distinctive nutritional requirements, on the basis of recognized scientific principle, are established by the medical evaluation. Medical foods are regulated by the FDA and will be prescribed or monitored by medical supervision. For example- supplement for a patient with inborn errors in amino acid metabolism, hyperhomocysteinemia, pancreatic exocrine insufficiency, cachexia in cancer^{xxii-xxiii}.

Nutraceutical approach in Ayurveda:

The prime aims and objectives of the Ayurveda is the establishment of the healthy condition and removes disease condition. In Ayurvedic dietetics importance given to food in prevention and treatment of disease as well as herbs and herbal formulations are the part of daily food supplements. According to *Acharya Charak*, a diet which besides providing the basic nutrition to the body, help to maintain the healthy state of the body and prevents the occurrence of diseases should be consumed^{xxiv}. An interesting verse by *Acharya Lolimbaraja* regarding the importance of food is, if wholesome diet is given in a planned way, then there is no need to administer medicines and if wholesome diet is not being used then too there is no need to give medicine as this is not going to cure the disease in the absence of wholesome diet^{xxv}. The concept of *Aahar* is a holistic approach and far beyond the modern view. An indication of *Pathya-apathy*, *Hita-ahita* and *Satmya-asatmya* are based on individualistic approach. Ayurveda has a great emphasis on the quality of nutritious food as *Rasayana* (preventing degenerative changes), *Balya* (Post illness nutrition), *Brihan* (Provides deficient nutrient), *Jeevaniya* (maintaining longevity), *Vyadhikshmatva* (enhancing the immunity) and *Vajikaran* (maintaining vitality and vigor)^{xxvi}. The science of food and nutrition in Ayurveda was much developed. *Acharya Charak* has categorized all food items into twelve classes, *Acharya Sushrut* in ten and thirteen. There is another classification based on consistency of food products as *Ashita* (Semi-solids, advised for aged people), *Khadita* (solid food, advisable for young people with good digestion), *Peeta* (liquid in consistency, advisable for the newborns, children and diseased people

and advocated in summer) and *Leeda* (Paste form that can be licked, advisable for children, convalescing and old people)^{xxvii}.

Rasayana: Nutraceuticals in Ayurveda

A one of the novel concepts in Ayurveda, which is more than nutraceuticals, is called Rasayana. The word Rasayana is composed of two words *Rasa* and *Ayana*. *Rasa* means *Rasa Dhatu* (nutritional plasma) and *Ayana* means pathway (microcirculatory channels in the body)^{xxviii}. Rasayana is one of the branches of *Ashtanga* Ayurveda (eight clinical specialties) which is not only a drug therapy but is a specialized procedure practiced in the form of rejuvenative recipes, dietary regimen and special health-promoting conduct and behavior. Rasayana is the way to attaining longevity, memory, intelligence, freedom from disorder, youthfulness, the excellence of lustre, complexion and voice, the optimum level of physical strength and sense organs. Rasayana drugs act on work at *Dhatu* level which reflects its sub-cellular activity. It can be collectively compared with antioxidant, regenerative, immuno-modulatory, adaptogenic. Rasayana is not only helps in treating a disease but can also be helpful in preventing a disease^{xxix}.

Classification of Rasayana:

Charak has advocated special the outdoor and indoor regimen and he introduced a large number of Rasayana drugs both in single and compounds, herbs and minerals.

According to Specific Indication

Rasayana may be classified as-

As per scope of use:

1. *Kamya Rasayana*: It is used to fulfill the desire for some specific condition. e.g., *prana* (vitality), *Aayu* (longevity), *Smriti* (memory), *medha* (intellect).

(a) *Prana kamya*: Rasayan therapy aiming to fulfill desires of vitality and longevity of life e.g. *Triphala Rasayana*, *Haritaki Rasayan*.

(b) *Medhakamya*: Promoter of intellect e.g. *Brahmi*, *Shankhpushpi*.

(c) *Shreekamya*: promoter of complexion and luster, fortune.

2. *Naimittika*: It hastens the recovery from prevailing diseases and promotes the vitality in specific diseases. e.g. *Shilajatu* in *Prameha*, *Bhallataka* in *Amavata*. *Dhatri Rasayana*, *Mandookaparni Rasayana*, *Brahmi Rasayana*, and *Triphala Rasayana*.

3. *Ajastrika*: Regular use of nutritious foods for the endorsement of health e.g. *Ksheer-Ghritaabhyas*.

As per method of use:

1. *Vata-tapika*: Therapy in outdoor (OPD) basis.

2. *Kuti-praveshik*: Therapy in indoor (IPD) basis.

As per content of Rasayana:

1. *Ausadha* Rasayana-Drug therapy

2. *Ahara* Rasayana- Dietary therapy

3. *Achara* Rasayana- Code of conduct and daily habits.

Nutraceutical vs Rasayana therapy:

Nutraceuticals are all about the nutritional fulfillment of the body requirement. There are many reasons for nutritional deficiencies which lead to ailments and degenerative processes. Nutraceutical product provides nutritional supplement which cures the symptoms and prevents from further degeneration. Rasayana therapy is a broad aspect and more than nutraceuticals because it not only provides nutrition but also increases longevity, vitality, immunity and body strength^{xxx}.

Table 1: List of some marketed nutraceuticals in India

Products	Category	Manufactures
Threptin Diskettes	Protein supplements	Raptakos, Brett & Co. Ltd. Mumbai
GRD	Nutritional supplements	Zydus Cadila Ltd. Ahmedabad
Proteinex	Protein supplements	Pfizer Ltd., Mumbai
Calcirol D-3	Calcium supplements	Cadila healthcare limited, Ahmedabad

Table 2: List of some *Rasayana* preparations

Preparations	Benefits
<i>Chyavanprasha</i>	General health and prevention of respiratory disorders
<i>Brahma Rasayana</i>	Protection from mental stress
<i>Narasimha Rasayana</i>	Vigor and vitality
<i>Phala Ghrita</i>	Reproductive health
<i>Arjuna Kshirapaka</i>	Cardio protection
<i>Rasona Kshirapaka</i>	Cardio protection
<i>Shilajatu Rasayana</i>	Diabetes mellitus
<i>Vachadi ghrit</i>	Improves memory and speech in children
<i>Brahmi ghrit</i>	Improves memory in young and old

Recent trends in nutraceuticals:

In recent years, rising awareness among consumers towards the health benefits of foods and their nutritional benefits for disease prevention and health enhancement. Gradually increased understanding about the potential mechanism of biologically active components in food, which could improve health and probably reduce the risk of disease and enhance overall well being. Emerging field in nutraceuticals are Nano-nutraceuticals, Nutrigenomics, Nutrigenetics, Molecular nutrition and safety and efficacy of nutraceuticals^{xxx}. Huge demands of herbal products project the pharmaceutical industries to produce herbals nutritional supplements.

CONCLUSION:

The probable mode of action of Rasayana is the direct enrichment of the nutritional quality of *Rasa Dhatu*, promotes digestion, metabolism and nutrition through improving *Agni* and promotes the competence of *Srotas* (microcirculation). In classics, Rasayana has been indicated not only for maintenance of health but also for the treatment of the disease. In today's medical practice it has a vital role to serve mankind through improvement in the body-mind-spirit system. Rasayana therapy is used to achieve the physical, mental and social well being. Many Ayurvedic formulations have tremendous nutritional benefits. There are many preparations in classics which have not been used in therapeutics are also challenges for pharmaceuticals. There are also need for further research and development of these preparations for nutritional supplements.

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