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Popular Article

Positioning of dairy products' as functional foods, nutraceuticals, and medicinal agents

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Abstract

Due to their purported safety and potential nutritional and therapeutic effects, nutraceuticals have gained significant significance. Pharmaceutical and dietary industries are aware that financial success benefits healthier consumers and the shifting trends that lead to the proliferation of these heart-oriented value-added products. Many dietary supplements claim to have several therapeutic advantages. Despite benefits the unfavorable effects include a lack of convincing data. Glucosamine, omega-3 fatty acids, Echinacea, cod liver oil, folic acid, ginseng, calcium-fortified orange juice, and green tea are a few popular nutraceuticals. According to a report, functional foods have elements that are physiologically active and offer a range of health advantages. Studies have demonstrated that some foods and dietary habits have a significant impact on the primary prevention of various disease states that result in the identification of foods with potential functional properties. To support the potential health advantages of various functional foods that have not yet received clinical validation for the associations between diet and health, research and studies are required. The word "functional foods" may also refer to foods that are healthy or functionally healthy, foods that have been improved nutritionally, or even traditional medicines.

Introduction

Nutraceuticals and functional foods are crucial in preventing and treating illnesses linked to unhealthy lifestyles. These foods provide nutritional components that support a healthy lifestyle and even treat some disorders. When a food has a major health impact that goes beyond simple traditional nutrition, it might be regarded as functional. Functional foods, for example, which have therapeutic properties, are examples of foods from which nutraceutical products are generated. Its beneficial elements can be separated and refined from sources that are marine, terrestrial, or both. International interest in functional foods and nutraceuticals has moulded a developing worldwide market.



Nutraceuticals, often known as "functional foods," have generated a great deal of debate since they cross the boundary traditionally drawn between diet and medicine. Therefore, functional food gives the body the necessary number of fundamental requirements and components for healthy living, such as proteins, lipids, carbs, and vitamins. Functional foods that aid in disease/disorder prevention and/or medication other than deficiency illnesses like anemia are referred to as "nutraceuticals." Therefore, a different consumer may employ functional food as a nutraceutical.

Nutraceuticals include nutrient-fortified dairy products (for instance, milk has a nutrient and casein is its pharmaceutical byproduct) and citrus fruits (for instance, orange juice has a nutrient and ascorbic acid is its pharmaceutical byproduct). This overview highlights some of their sources, including fruits, vegetables, grains, and legumes, as well as the basic ideas behind nutraceuticals and functional foods.

Nutraceuticals

They included dietary fibres, polyphenols, antioxidants, spices, flavonoids, vitamins, probiotics, and polyunsaturated fatty acids, among other likely any natural, healthy ingredients for both therapy and health. A favorable view of free fatty acids results from the conviction that functional components will aid in the prevention of illnesses.

Numerous nutraceutical classifications were suggested based on various criteria. Nutraceuticals are divided into the following categories based on their established stage-

- (1) Nutraceuticals are made up of substances that have been shown to have therapeutic benefits in a variety of research and epidemiology studies, although they do not always adhere to large-scale clinical investigation
- (2) Established nutraceuticals are made up of substances that have been clinically proven to have positive effects on health.

They can be separated based on the source of the nutraceutical from which they were isolated-

- (1) Phytochemicals, such as flavonoids, that are derived from plants or herbs
- (2) Nutrients derived by microorganisms, such as vitamin A
- (3) Animal-derived nutrients taken from livestock

Nutraceuticals are divided into four groups depending on their chemical composition- polyunsaturated fatty acids; prebiotics; flavonoids; and vitamins.

The following additional nutraceuticals can be categorized.

- (1) Nutritional improvements. These formulations include nutrients like salt alone or in combination with different preservatives.



(2) Nutrient-dense foods. These are characterized as foods enriched by agents that support optimum health and help lower the risk of disease, such as oatmeal's soluble fibre, which lowers cholesterol levels. They are foods that have been fortified with nutrients for health advantages; they are not just nutrients.

Nutraceutical future

In the twenty-first century, nutraceuticals are commonly referred to be more appetizing functional foods. The doctor of the future would have been a better resource to offer preventive medical methods if they had used nutraceutical instruments. Advances in nutraceuticals will promote individualized diet tailored to a person's profile to maximize health and comfort. Consumers are seeking minimal foods with additional dietary advantages and organoleptic value, according to the nutraceutical sector. This development in turn encourages the growth of the world's nutraceutical markets. The manufacturing of evolving nutraceuticals seems set to dominate the scene in the new millennium. Its rapid development and growth have an impact on the food, healthcare, agricultural, and pharmaceutical industries. The relationships between diet and health are still being uncovered through study worldwide.

Functional food

Functional food is defined as any food or dietary component that can improve health in ways other than through basic nutrition. By achieving physiological activities beyond nutritional impacts, such foods lower the risk of lifestyle-related illnesses. These foods are intended to treat or prevent the condition. Food can be made useful in a number of ways. When the functional component is added, subtracted, or altered during processing or through genetic engineering, new goods are produced and put on the market. The key problem developing functional foods is ensuring that the bioactive components endure manufacturing and storage. Any type of food that is created can benefit from the addition of vitamins, fibre, omega-3 fatty acids, minerals, bacterial cultures, and flavonoids. Such foods should be regularly consumed to effectively control conditions like cardiovascular disease (CVD), tumours, diabetes, and hypertension.

Functional dairy products

Functional dairy products have advanced as food has progressed well beyond meeting basic needs and have been touted as a main deficient syndromes therapy tool to lower disease risk. In order to create unique functional yogurt-like products, typical yoghurt starter cultures were either used alone or combined with *Bifidobacterium longum* without additions (control). Dairy markets currently place functional foods above accidents and financial performance; therefore, the production of



functional dairy products presents a significant challenge to the food industry. Dairy products could be considered a part of the functional food category because they contain calcium, a variety of healthy proteins, sphingolipids, butyric acid, conjugated linoleic acid, and probiotic cultures. The dairy products sector is ideally placed to grow and benefit from the functional food market. This chance is further improved as people become more health-conscious and conscious of the importance of nutrition in their meals. The desire of consumers is to have more control over their health.

A balanced diet consists of four main food groups, one of which is milk and dairy products. A diversified diet should also include milk, which is a substantial source of protein, B-group vitamins, calcium, vitamin A, dimethylglycine B16, folate B9, magnesium, and zinc. In the past two decades, "healthy" food marketing has been successful on the market. Scientists have discovered a specific compound or combination of substances that have showed a reduction in illness risk despite the growing popularity of functional meals. The management of the transit duration, gastrointestinal habits, and motility of the intestinal mucosa as well as the modulation of epithelial cell proliferation are among the most promising goals for functional meals.

The management of nutrient bioavailability, modulation of the immunological activity of the digestive system, or mediation of the endocrine activity of the digestive system are all intriguing objectives associated to a balanced microflora.

Dairy products with probiotics

Lactic acid bacteria (LAB) have become more and more popular as probiotics in recent years. The ability of a LAB strain to produce antimicrobial chemicals against pathogenic and cariogenic bacteria, to bind to and colonize human intestinal mucosa, as well as acid and bile resistance, is crucial for a LAB strain to be a probiotic. Additionally, probiotics are helped to colonize the intestine mucosa by the formation of antimicrobial compounds because these compounds increase their competitive advantage over the natural gastrointestinal microbiota. According to studies, capsular polysaccharides may promote bacterial adhesion to biological surfaces and so promote the colonization of many ecological niches. Probiotics have a number of health advantages, including boosting immunity, acting as a vaccine's adjuvant, attaching to cells in the human gut, increasing vitamin K and vitamin B production, fortifying the digestive system's protective barrier, preventing radiation therapy-induced diarrhea, and acting as antibiotics for rotavirus.

Additionally, it has anticancer properties, decreases cholesterol and blood pressure, and is beneficial in the treatment of constipation, preventing inflammatory intestinal problems, and treating constipation. According to research, some lactobacilli strains exhibit antioxidant properties that may



reduce the likelihood of free radical formation. Probiotics also control inflammatory and hypersensitive reactions. The control of cytokine function may be the reason of this. They lessen the likelihood of childhood eczema and prevent the recurrence of inflammatory bowel disease in adulthood. They also alleviate milk allergies. By boosting phagocytosis, elevating the ratio of natural killer cells to T lymphocytes, and increasing the amount of plasma cells that generate IgA, probiotics enhance immune function. The consumption of fermented milk with certain LAB strains can result in mild drops in blood pressure because of the formation of ACE inhibitors, such as peptides, during fermentation. By breaking down bile in the intestines and inhibiting reabsorption, probiotics are likely able to reduce serum cholesterol levels in animals. This may result in minor drops in LDL and total cholesterol levels. According to studies, *Lactobacillus paracasei* helps people lose belly and body fat. These probiotics reportedly have an anti-obesity impact. Most likely, gut bacteria can regulate body weight through affecting the host's immunological, neuroendocrine, and metabolic processes.

Functional foods' health advantages

According to Marco et al. and Sarkar, the most promising targets of functional foods are (i) intestinal function, including those that control transit time, bowel habits, mucosal motility, and modulation of epithelial cell proliferation (ii) gastrointestinal (GI) function that is associated with improved nutritional and functional properties of fermented foods. (iii) systemic processes like lipid homeostasis, which are subtly impacted by nutrient intake or fermentation.

Additionally, the emphasis is on how the consumption of functional meals extends the following health benefits to people-

Reduced risk of cancer, decreased risk of cardiovascular disease, improved general health, and reduced chance of cancer. Memory enhancement, better weight control, and a lower chance of contracting additional ailments, Improved mental health, decreased osteoporosis, quicker reaction times, and better fetal health

Benefits of Nutraceuticals for Health

When compared to other therapeutic agents, nutraceuticals are employed in an effort to achieve desired therapeutic outcomes with fewer adverse effects. The consumption of meals from plants, nuts, whole grains, cereals, and seafood is essential for maintaining good health and preventing disease. Lutein (for macular degeneration), folic acid, and cod liver oil capsules are a few well-liked nutraceuticals. The most well-liked functional food and drink items, to name a few, include green tea, omega-3-enriched yoghurts, orange juice with added calcium, and eggs with the



fatty acid. The majority of dietary supplements offer a range of therapeutic advantages. The following disorders are said to be physiologically benefited by or protected against by nutraceuticals- CVD, Cancer, Diabetes, Obesity, Chronic Inflammatory Disorders, Parkinson's Disease, and Alzheimer's Disease are just a few.

Conclusion

In order to promote good health and aid in illness prevention, this article seeks to inspire medical and healthcare professionals to learn more about the characteristics of functional foods. Functional foods, which can come from either animal or plant sources and contain physiologically active ingredients, can enhance health. By promoting health through prevention rather than treatment, nutraceuticals and functional foods may be able to help ease the strain on healthcare systems. However, it is important to note that functional foods are not medications because they do not treat, prevent, or cure diseases. However, it is anticipated that the development of potential therapeutics will heavily rely on nutraceutical items. Authorities on society's health view nutraceuticals as a potent instrument for conserving health, combating acute and chronic diseases brought on by poor nutrition, and serving as a form of therapy and preventive. Clinical use of nutraceuticals is evolving, however more in-depth research is required to address the significance of pharmacological and clinical difficulties.

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