

Formulation and Evaluation of Nutraceuticals

Let Food be Your Medicine

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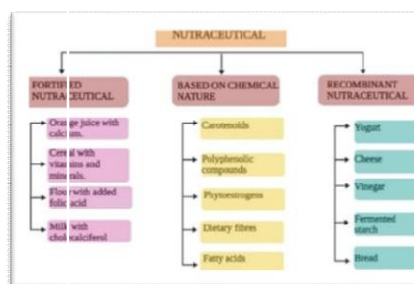
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Abstract: This research article aims to evaluate the efficacy and safety of various nutraceuticals in promoting health and preventing disease. A systematic review was conducted, analyzing randomized controlled trials and observational studies from the past decade. The nutraceuticals studied included vitamins, minerals, herbal extracts, and other dietary supplements. Results indicate that certain nutraceuticals may offer benefits in specific health conditions, such as cardiovascular disease, diabetes, and cognitive decline. However, inconsistent findings and potential risks were also observed. Further research is needed to establish clear guidelines on the use of nutraceuticals for health promotion and disease prevention. From a purely pragmatic standpoint, consuming protein post-workout represents an opportunity to feed; this in turn contributes to one's total daily energy and protein intake. Furthermore, despite recent suggestions that one does not "need" to consume protein during the immediate (1 h or less) post-training time frame, it should be emphasized that consuming nothing offers no advantage and perhaps even a disadvantage. Thus, based on performance and recovery effects, it appears that the prudent approach would be to have athletes consume protein post-training and post-competition.

Keywords: Protein, Dietary Supplement, Minerals, Vitamins, Balanced diet, weight gain, food, protein powder, healthy life, Health

I. INTRODUCTION

Nutraceuticals, a portmanteau of "nutrition" and "pharmaceuticals," represent a rapidly growing sector in the field of health and wellness. These bioactive compounds derived from foods, herbs, and dietary supplements have gained significant attention for their potential health-promoting and disease-preventing properties. With increasing consumer interest in natural and alternative therapies, the global nutraceutical market has expanded exponentially in recent years. Despite their popularity, the scientific evidence supporting the efficacy and safety of nutraceuticals remains variable and sometimes conflicting. This research aims to explore the current state of knowledge regarding the benefits, mechanisms of action, and potential risks associated with various nutraceuticals. Through a comprehensive review of existing literature, we seek to provide valuable insights that can guide healthcare professionals, researchers, and consumers in making informed decisions about the use of nutraceuticals for health enhancement and disease prevention.



Dietary protein plays a critical role in countless physiological processes in the body. The current Recommended Dietary Allowance (RDA) for healthy individuals is 0.8 g/kg/day (1). It is increasingly evident, however, that protein intake of at least 1.4–1.6 g/kg/day (2) would be more appropriate for active individuals attempting to optimize training



adaptations. In an effort to meet this threshold, protein supplements are often consumed. In 2015, protein powder sales were valued at 4.7 billion U.S. dollars and were second only to sport drinks in the sports nutrition are crucial to living a healthy life. Now, it is not

What is the Need For Maintaining the Constituent of Foods?

Food and its components play a major role in our lives. Whether it's a baby, young children, adolescent, or a complete grown-up man, the human body grows at a rapid rate until a particular age. The components of food are required for fueling the growth and maintaining the body after the growth is stopped. Human body cells need to grow and develop just like we do. It is actually the body parts, including cells, tissues, bones, and muscles that grow, and we, from the outer layer, see ourselves as growing. Protein is the building block for our body, and thus, it is a vital inclusion for growth and maintaining a healthy living. Protein with the combination of fats, minerals, and other ingredients provides the best nutrients to our body. The growing phase of our body needs some extra amount of nutrients when compared to the latter part.

Maintaining a good link between weight and nutrition can help people reduce the symptoms of chronic diseases and an overall decline in health. Before it's too late, consider taking steps to improve your dietary rules by introducing a well-consulted balanced diet.



AIM & OBJECTIVE :

Aim :

To Prepare And Evaluate Protein Powder
to leverage the therapeutic properties of food and its components to improve and maintain health and prevent disease.

Objective :

- Treating and preventing disease.
- Allows farmers to optimize crop productivity while reducing negative environmental impacts.
- Improve the knowledge, attitude, and behavior of children, parents, and caregivers by providing training on health and nutrition; and. Improve and maintain the nutritional status of the children.

NEED OF STUDY:

HISTORY:

The concept of nutraceuticals dates back thousands of years, rooted in traditional medicine systems that recognized the therapeutic properties of certain foods and herbs. Here's a brief history of nutraceuticals:

Ancient Civilizations: Ancient civilizations, such as the Egyptians, Greeks, and Chinese, used foods and herbs for medicinal purposes. Ingredients like garlic, honey, and various herbs were employed to treat a range of ailments.

Middle Ages: During the Middle Ages, monasteries and herbalists continued to preserve and document knowledge about the medicinal properties of plants. Herbal remedies were widely used for healing purposes.



FUTURE SCOPE:

The scope for nutraceuticals is vast and continually expanding, encompassing various areas of health and wellness. Here's an overview of the scope for nutraceuticals:

- **Health Promotion and Disease Prevention:** Nutraceuticals are often used to support overall health and well-being, helping to prevent chronic diseases such as cardiovascular disease, diabetes, and cancer. They can also play a role in enhancing immune function and reducing the risk of infections.
- **Nutritional Supplements:** Nutraceuticals serve as dietary supplements, providing essential vitamins, minerals, and other nutrients that may be lacking in the diet. They can help address nutritional deficiencies and support optimal health.
- **Functional Foods:** Functional foods are products that have been fortified or enriched with bioactive compounds, such as probiotics, prebiotics, antioxidants, and phytonutrients. These foods offer additional health benefits beyond basic nutrition.
- **Sports Nutrition:** Nutraceuticals are widely used in sports nutrition to enhance athletic performance, improve recovery, and support muscle growth and endurance. Ingredients like protein powders, amino acids, and creatine are popular among athletes and fitness enthusiasts.
- **Skin and Beauty:** Nutraceuticals are increasingly being incorporated into skincare and beauty products due to their potential anti-aging, antioxidant, and anti-inflammatory properties. Ingredients like collagen, vitamins, and botanical extracts are commonly used in these formulations.

BENEFITS OF NUTRACEUTICALS:

Nutraceutical benefits are unlimited, and new uses are being investigated every day. From physiological to psychical health, nutraceuticals can treat many illnesses and ailments. Choose Nutraceuticals from reliable Nutraceutical Manufacturers in India to get the below-listed benefits:

Boost energy

There are different types of nutraceuticals, which actually help us boost our energy, just like all the vitamins, primarily from the Vitamin B group. Additionally, the Vitamin D group helps you stay active.

Improve overall health

Nutraceuticals aid in improving our overall health. As discussed before that how a balanced diet helps improve our health. It adds nutritional value to our bodies and helps in improving both mental and physical health.

Improve Eye Health: Patients with eye disorders and conditions such as age-related glaucoma, macular degeneration, and visual disorders can benefit from certain nutraceuticals

Treat Inflammation

Nutraceuticals are showing promising outcomes in the prevention and treatment of inflammation because of the presence of phytochemicals. They can decrease oxidative stress in chronic inflammatory diseases such as osteoarthritis, asthma, rheumatoid arthritis, cancer, and autoimmune diseases.

ADVANTAGES:

Nutraceuticals offer several advantages, making them a popular choice for individuals looking to improve their health and well-being. Here are some of the key advantages of nutraceuticals:

1. Health Promotion and Disease Prevention.
2. Low Risk of Side Effects.
3. Promotes Long-Term Wellness.
4. Improve function of immune system.
5. Enhance athletic performance.



DISADVANTAGES:

While nutraceuticals offer several advantages, there are also some potential disadvantages and considerations to be aware of. Here are some of the key disadvantages of nutraceuticals:

1. Lack of Regulation and Quality Control.
2. Overuse or Misuse.
3. Cost Considerations.
4. High cost equipment.

MATERIAS & EQUIPMENTS:

• Ingredients:

Soya Chunks, Chana, Peanuts, Almonds, Lotus seed, Dried Dates, Candy sugar, Ashwagandha powder, Shatavari powder, Dried Ginger Powder.

• Flavour: Chocolate (Coca).

• Equipments:

Weighing balance, mortal & pestle, burner, petri plates, sieves no. 40 & 80, Grinder mixer, spatula etc.

INFORMATION ABOUT INGREDIENTS:

Soya chunks:

Soy protein isolate, often referred to as soy protein "chunk," is a popular plant-based protein source that has gained attention for its potential health benefits and use as a nutraceutical ingredient. Here's some information about soy protein isolate as a nutraceutical:

- **Protein Content:** Soy protein isolate is a high-quality protein source, containing all essential amino acids required by the human body. It is often used in protein supplements, bars, and fortified foods.
- **Heart Health:** Consuming soy protein isolate has been associated with beneficial effects on heart health, including lowering LDL cholesterol levels. The FDA has approved a health claim stating that consuming 25 grams of soy protein per day, as part of a diet low in saturated fat and cholesterol, may reduce the risk of heart disease.
- **Bone Health:** Soy protein isolate contains isoflavones, phytoestrogens that may help support bone health and reduce the risk of osteoporosis, particularly in postmenopausal women.

Roasted chana:

Roasted chana, also known as 'roasted chickpeas or gram', is a popular snack in many cultures and can also be considered a nutraceutical due to its nutritional benefits. Here's some information about roasted chana as a nutraceutical:

- **Protein Content:** Roasted chana is a good source of plant-based protein, making it an excellent option for vegetarians and vegans. Protein is essential for muscle building, repair, and overall health.
- **Fiber:** Chickpeas are high in dietary fiber, which can help promote digestive health, regulate blood sugar levels, and support heart health. A diet rich in fiber can also aid in weight management by promoting feelings of fullness.
- **Minerals:** Roasted chana is a good source of essential minerals like iron, magnesium, phosphorus, and zinc. These minerals play vital roles in various bodily functions, including energy production, bone health, and immune system functions.
- **Low Glycemic Index:** Chickpeas have a low glycemic index, which means they cause a slower rise in blood sugar levels compared to high-glycemic foods. This can be beneficial for maintaining stable blood sugar levels and may reduce the risk of type 2 diabetes.
- **Antioxidants:** Chickpeas contain antioxidants, including polyphenols and flavonoids, which have anti-inflammatory and immune-boosting properties. Antioxidants help protect cells from damage caused by free radicals and oxidative stress.



Peanuts:

Peanuts are a popular and nutritious food that can also be considered a nutraceutical due to their health-promoting properties. Here's some information about peanuts as a nutraceutical:

- **Nutrient-Rich:** Peanuts are packed with essential nutrients, including protein, healthy fats, fiber, vitamins, and minerals. They are a good source of biotin, copper, niacin, folate, manganese, vitamin E, and phosphorus.
- **Heart Health:** Consuming peanuts and peanut products has been associated with lower risks of heart disease. They contain monounsaturated and polyunsaturated fats, including omega-6 fatty acids, which can help reduce LDL cholesterol levels and improve heart health.

Almonds:

Almonds are nutrient-dense nuts that offer a range of health benefits, making them a popular choice as a nutraceutical ingredient. Here's some information about almonds as a nutraceutical:

- **Nutrient Profile:** Almonds are rich in essential nutrients, including protein, healthy fats, fiber, vitamins, and minerals. They are an excellent source of vitamin E, magnesium, manganese, and biotin.
- **Heart Health:** Consuming almonds has been linked to improved heart health due to their content of monounsaturated fats, fiber, and antioxidants. Regular almond consumption may help reduce LDL cholesterol levels, lower blood pressure, and decrease inflammation, all of which contribute to heart disease risk reduction.

Lotus seed:

Lotus seeds, also known as 'lotus nuts or makhana', are the seeds of the lotus flower and have been consumed for centuries in Asian cuisine and traditional medicine. Here's some information about lotus seeds as a nutraceutical:

- **Nutrient-Rich:** Lotus seeds are a good source of protein, fiber, magnesium, potassium, and phosphorus. They are also low in calories and fat, making them a nutritious snack or ingredient in various dishes.
- **Anti-Aging Properties:** Lotus seeds contain kaempferol, a flavonoid with antioxidant properties that help neutralize free radicals and reduce oxidative stress. Regular consumption of lotus seeds may help slow down the aging process and promote skin health.
- **Heart Health:** Lotus seeds are low in sodium and high in potassium, which can help regulate blood pressure and reduce the risk of cardiovascular diseases. The magnesium content in lotus seeds also supports heart health by promoting normal heart rhythm and muscle function.
- **Digestive Health:** The fiber content in lotus seeds promotes digestive health by supporting regular bowel movements and aiding in the prevention of constipation.

Ashwagandha:

Ashwagandha is often included in protein supplements for its potential to support muscle recovery and reduce stress.

- It's an adaptogenic herb that's been used in Ayurvedic medicine for centuries. Studies suggest it may improve strength and muscle mass, reduce inflammation, and enhance overall physical performance.
- Always check the ingredients and dosage to ensure it aligns with your health goals and consult with a healthcare professional if needed.

Dried Dates:

Dried dates are the dehydrated form of the fruit of the date palm tree (*Phoenix dactylifera*) and have been consumed for thousands of years due to their sweet taste and numerous health benefits.

Dried dates are nutrient rich having digestive health as well as heart health. It is also used as energy booster. And it promotes bone health.



Candy sugar:

Candy sugar, also known as 'rock candy or crystallized sugar', is a type of sugar made by crystallizing sugar syrup. While candy sugar is primarily used as a sweetener in various culinary applications and beverages, it does not offer significant health benefits like other nutraceuticals.

Candy sugar is beneficial for kidney related problems. It is also used as sweetening beverages as well as it is used in sour throat.

Shatavari:

Shatavari, also known as 'Asparagus racemosus', is a popular herb in Ayurveda known for its various health benefits, especially for women's reproductive health. When used in protein powder supplements, it's often included for its purported ability to support hormonal balance, improve digestion, and boost immunity.

Dried ginger powder:

Dry ginger powder, also known as 'ground ginger or ginger powder', is made from dried ginger root and has been used for its medicinal properties and culinary uses for centuries.

Chocolate (cocoa):

Chocolate is a popular flavoring agent used in various nutraceutical products due to its delicious taste and the appeal it adds to supplements and functional foods.

Enhanced Taste: Chocolate flavor enhances the taste of nutraceutical products, making them more palatable and enjoyable for consumers. This can improve compliance and adherence to supplement regimens, encouraging regular consumption.

EXPERIMENTAL WORK:

FORMULATION TABLE:

Sr. no.	Ingredients	Quantity (gm)	Uses
1	Soya chunks	40 gm	Rich protein source, Improves digestion.
2	Roasted chana	30gm	Energy booster, improves hemoglobin.
3	Almonds	35gm	Blood sugar control, bone health.
4	Peanuts	20gm	Healthy for heart.
5	Lotus seed	35gm	Anti aging property, good for hair, relives stress.
6	Ashwagandha	10gm	Anti inflammatory, boost immunity, cardioprotective.
7	Shatavari	10gm	Improves fertility, boost immunity, beneficial for pregnant women.
8	Candy sugar	05gm	Energy booster, kidney protective.
9	Dried dates powder	35gm	Anti diabetic, anti inflammatory.
10	Dried ginger powder	½ tbsp	Anti inflammatory.
11	Chocolate(cocoa)	25gm	Flavouring agent.

METHOD OF PREPARATION:

- ☐ Step 1: Firstly weigh accurately all ingredients required for protein powder formulation..
- ☐ Step2: Then slightly dry roasted all ingredients one by one for 3 to 4 min.
- ☐ Step3: A grinder was taken for grind the ingredients well, firstly all ingredients were grinded one by one.
- ☐ Step4: After that all ingredients were mixed in one container.
- ☐ Step5: Then ashwagandha and shatavari powder was added in that mixture; as well as dried ginger powder added in it.
- ☐ Step6: cocoa powder/chocolate powder was added in that mixture as a flavoring agent to improve the test of protein powder and mixed well.



- ☐ Step7: Final mixture was weighed and transferred in a air tight and well closed container (bottle)
- ☐ Step8: For better result enjoy it with milk, or water.

EVALUATION:

When evaluating protein powder, several key factors should be considered to assess its quality, efficacy, safety, and suitability for individual needs. Here are some aspects to evaluate:

1. Protein Content and Quality: Add 2ml of sodium hydroxide and 5 to 6 drops of copper sulfate solution to it.
 - ☐ Shake the test tube gently to mix the ingredients thoroughly and allow the mixture to stand for 4 – 5 minutes.
 - ☐ If there is the appearance of bluish- violet color, it indicates the presence of protein.
2. Ingredients and Additives: Review the ingredient list to identify any artificial flavors, sweeteners, colors, or preservatives.
 - ☐ Choose protein powders with minimal additives and ingredients that align with your dietary preferences and restrictions.
 - ☐ Look for products that are free from allergens or ingredients you may be sensitive to.
3. Nutritional Profile: Evaluate the nutritional profile of the protein powder, including macronutrient content (protein, carbohydrates, fats), micronutrient content (vitamins, minerals), and calorie count per serving. Consider the overall balance of nutrients and how it fits into your daily dietary intake.
4. Mixability (Dissolution) and Texture: To Assess the mixability and texture of the protein powder when mixed with water, milk, or other liquids.
 - ☐ Protein powder tends to slightly granular and it is not totally mix/dissolve in liquid ie. Milk/water.
5. Taste, Flavor and Odour :
 - ☐ Taste of protein powder: chocolate like test with slightly earthy as well as slightly sweet.
 - ☐ Flavor of protein powder : chocolate.
 - ☐ Odour: slightly earthy and nutty odour.

Color: light brownish Texture: slightly granular Dissolution in milk Dissolution



RESULT:

The study of Nutraceuticals & The formulation and evaluation of protein powder were done successfully.

II. CONCLUSION

The study investigated the efficacy, safety, and consumer perceptions of protein powder supplementation.

Overall, the findings of this research contribute to our understanding of protein powder supplementation and provide evidence-based recommendations for consumers, healthcare professionals, and industry stakeholders. By addressing the efficacy, safety, and consumer preferences of protein powder products, this study aims to support informed decision-making and promote optimal health and wellness outcomes.

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