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PHYTO-PRO: A NOVEL HERBAL PROTEIN POWDER FOR ENHANCED NUTRITION AND WELLNESS

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ABSTRACT

Phyto-Pro is a revolutionary herbal protein powder that combines the nutritional benefits of plant-based proteins with the therapeutic properties of herbs. This unique formula features a blend of protein-rich botanicals, including pea, rice, and hemp, alongside adaptogenic herbs like ashwagandha, rhodiola, and ginseng. Phyto-Pro is designed to support muscle growth and recovery, while also promoting overall wellness and resilience. With its high protein content, rich nutritional profile, and adaptogenic properties, Phyto-Pro is an ideal supplement for fitness enthusiasts, athletes, and individuals seeking a natural, plant-based protein solution.

Protein powder is a dietary supplement containing concentrated protein from sources like milk, eggs, peas, and rice. It supports muscle growth and repair, weight management, and overall health. Various types, including whey, casein, pea, egg, and rice protein, cater to diverse dietary needs. When chosen and used appropriately, protein powder can be a valuable addition to a balanced diet and fitness regimen.

KEYWORDS: *Herbal Protein Powder, Plant-Based Protein, Adaptogenic Herbs, Muscle Recovery, Wellness, Nutrition.*

INTRODUCTION

Protein powders are a useful way to increase your daily protein intake, meaning they are suitable for anyone who is looking to follow a high protein diet. Protein powder should be seen as a food supplement and it isn't going to be the secret to muscle growth or fat loss without a good training and diet plan.

Proteins are large, complex molecules that play many critical roles in the body. They do most of the work in cells and are required for the structure, function, and regulation of the body's tissues and organs.

The global protein powder market has witnessed a significant shift towards plant-based and natural products, driven by increasing consumer demand for healthier and more sustainable options. Herbal protein powder, a novel category of protein supplements, combines the nutritional benefits of plant-based proteins with the therapeutic properties of herbs. This innovative approach to protein supplementation offers a unique opportunity for individuals seeking a natural, effective, and holistic solution for muscle growth, recovery, and overall wellness.

Protein powder is a dietary supplement made from various sources of protein, such as milk, eggs, peas, rice, and whey. It's a concentrated powder that contains a high amount of protein, often with minimal fat, carbohydrates, and other nutrients.

Protein powder is an easy way to get more protein daily. You can blend it into a shake or smoothie, sprinkle it into your oatmeal or add it to baked goods like bread or muffins. Extra protein, combined with regular exercise, can help you gain muscle, change your body composition, or meet your daily protein needs.

Protein powders can be made from whey, casein, egg, soy, pea, or rice. This article focuses on whey protein powders.

The protein in whey protein powder is derived from liquid whey, a byproduct of the cheese-making process.

Whey protein is a “complete protein,” meaning it contains all nine essential amino acids that the body must obtain through food or drink.

There have been no confirmed foodborne illness outbreaks linked to whey protein powder, although there have been precautionary recalls – one due to Clostridium botulinum and three due to Salmonella.

Between 2000 and 2020, at least 1 whey protein-associated outbreak was reported to CDC’s National Outbreak Reporting System (NORS), causing 2 illnesses, and 0 hospitalizations and deaths.

People commonly use whey protein for improving athletic performance and increasing strength. Whey protein is also used for asthma, diabetes, weight loss, and many other conditions, but there is no good scientific evidence to support most of these uses.

Benefits of Protein Powder

- Convenient: Protein powder is a quick and easy way to increase protein intake, especially for those with busy lifestyles.
- Supports muscle growth and repair: Protein is essential for building and repairing muscle tissue, making it popular among athletes and bodybuilders.
- Weight management: Protein powder can help with weight loss and maintenance by reducing hunger and increasing satiety.

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- Supports overall health: Protein is essential for various bodily functions, such as bone health, immune function, and enzyme production.

AIM: Development and Evaluation of Herbal Protein Powder

OBJECTIVE

- To select the protein rich ingredients. To formulate and standardize the health mix powder.
- To evaluate the organoleptic properties of the health mix powder incorporated in food products and analyse the antioxidant activity, nutrient composition, phytochemical, protein content for formulated product.
- To study the shelf life of the health mix powder in various packaged materials.

MATERIALS AND METHOD

Ingredients used in formulation

All the natural material used in the present study i.e. milk powder, makhana, cashew, oats, almonds, pumpkin & sunflower seeds, fennel seeds, Bengal gram & chia seeds. The details of the plant material are uses for the formulation of herbal protein powder are mentioned below:

INGREDIENT NAME

❖ **Milk Powder**

Synonyms: dried milk, or dry milk.

Role: It is a source of protein. Milk powder contains all of these essential amino acids, plus other that are required by children. Milk powder, also known as dehydrated milk or dry milk, is a powder made by evaporating milk to remove the water content. It's a convenient and shelf-stable alternative to liquid milk.

Fig 1. Milk Powder

Makhana

Family: *Nymphaeaceae*

Synonyms: fox nuts, lotus seeds, gorgon fruit, prickly water lily.

Class: Magnoliopsida

Chemical Constituents: The raw makhana contains 76.9% carbohydrates, 12.8% moisture, 9.7% protein, 0.9% phosphorus, 0.5% minerals, 0.1% fat, 0.02% calcium and 0.0014% iron.

Functional Properties

- Emulsification: Makhana contains a unique combination of proteins and starches that can help emulsify and stabilize protein powders
- Texture modification: Makhana can help modify the texture of protein powders, making them more palatable and easier to mix
- Foaming properties: Makhana contains proteins that can help create a stable foam, making it an excellent addition to protein powders designed for fitness enthusiasts.

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Fig 2. Makhana

Cashew Nuts
Family: *Anacardiaceae*
Common name: Cashew or sumac family
Order: Sapindales
Class: Magnoliopsida
Chemical Constituents: Cashew composed of fat (48.3%), protein(21.3gm), carbohydrates(20.5gm). It contains compounds including oleic acid, linolic acid, phytosterols, arginine, tocopherols, magnesium, and phenolic compounds.
Functional Properties

- Emulsification: Cashews contain a natural emulsifier, which can help stabilize and mix protein powders
- Texture modification: Cashews can help modify the texture of protein powders, making them more palatable and easier to mix.

Fig 3. Cashew Nuts

Oats
Family: *Poaceae* (also known as Gramineae)
Common name: Grass family
Order: Poales
Chemical Constituents: Oats contain about 60% starch, 14% protein, 7% lipids, and 4% β-glucan.
Carbohydrates

- Starch: 40-60% of oat grain
- Fiber: 8-12% of oat grain, including beta-glucan, a soluble fibre
- Sugars: small amounts of sucrose, glucose, and fructose

Proteins

- Avenalin: a globulin protein, accounting for 30-40% of oat protein

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- Avenin: a prolamin protein, accounting for 10-20% of oat protein
- Globulins: other globulin proteins, accounting for 20-30% of oat protein

Fig 4. Oats

Almonds
Family: *Rosaceae*
Common name: Rose family
Order: Rosales
Class: Magnoliopsida
Division: Magnoliophyte
Genus: Prunus
Species: Prunus dulcis (sweet almond) and Prunus Amygdalus (bitter almond).
Chemical Constituents: Almonds contain a variety of chemical constituents including lipids (around 50%), proteins (around 25%), and carbohydrates (around 20%), as well as essential fatty acids like oleic and linoleic acid, and bioactive compounds like flavonoids and phenolic acids.

Fig 5. Almonds

Pumpkin Seeds
Family*: Cucurbitaceae*
Order: Cucurbitales
Class: Magnoliopsida
Division: Magnoliophyte
Chemical Constituents: Pumpkin seeds are rich in essential nutrients and bioactive compounds, including healthy fats (linoleic and oleic acids), proteins, vitamins (A, E, B), minerals (magnesium, zinc, potassium), and antioxidants like carotenoids and phytosterols.
Nutrients

- Protein: 30-40% of pumpkin seed weight
- Fat: 40-50% of pumpkin seed weight, mostly polyunsaturated and monounsaturated
- Carbohydrates: 10-20% of pumpkin seed weight, mostly starch and sugars

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- Fiber: 5-10% of pumpkin seed weight, both soluble and insoluble
- Minerals: magnesium, zinc, iron, copper, and selenium

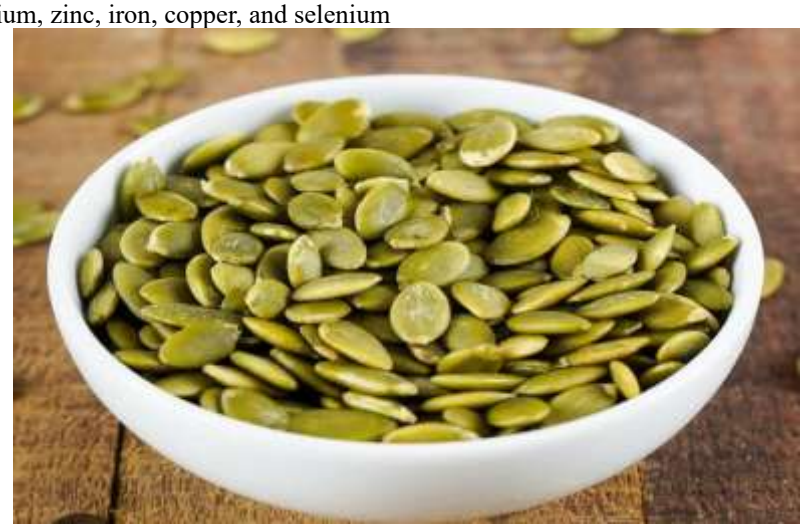

Fig 6. Pumpkin Seeds

Sunflower Seeds
family: *Asteraceae*
Order: Asterales
Class: Magnoliopsida
Division: Magnoliophyte
Genus: Helianthus
Species: Helianthus annuus (common sunflower)
Nutrients

- Protein: 20-30% of sunflower seed weight
- Fat: 40-50% of sunflower seed weight, mostly polyunsaturated and monounsaturated
- Carbohydrates: 20-30% of sunflower seed weight, mostly starch and sugars
- Fiber: 5-10% of sunflower seed weight, both soluble and insoluble
- Minerals: magnesium, selenium, copper, and zinc

Fig 7. Sunflower Seeds

Fennel Seeds
family: *Apiaceae*
Common name: Carrot family, Parsley family
Order: Apiales
Class: Magnoliopsida
Division: Magnoliophyte
Genus: Foeniculum
Species: Foeniculum vulgare (common fennel)
Chemical Constituents:
Chemical constituents, including the essential oil anethole, which contributes to its characteristic aroma and flavour. Other notable constituents include estragole, fenchone, and limonene. Additionally, fennel contains phenolic acids like ferulic acid, gallic acid, and O-coumaric acid.

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Fig 8. Bengal Gram

Chia Seeds
family*: Lamiaceae*
Order: Lamiales
Class: Magnoliopsida
Division: Magnoliophyta
Chemical Constituents:
Macronutrients
1. Carbohydrates: Chia seeds contain about 60-70% carbohydrates, primarily in the form of dietary fibre.
2. Protein: Chia seeds contain about 15-20% protein, making them a good source of plant-based protein.
Micronutrients
1. Fiber: Chia seeds are an excellent source of dietary fibre, containing about 10-12% fibre.
2. Omega-3 fatty acids: Chia seeds are a rich source of alpha-linolenic acid (ALA), a type of omega-3 fatty acid.

Fig 9. Chia seeds

Stevia
family: *Asteraceae*
Genus: Stevia
Species: Stevia rebaudiana
Chemical Constituents:
The wild varieties of stevia are composed of stevioside (5–10%), rebaudioside A (2–5%), rebaudioside C (1%), dulcoside A (0.5%), rebaudioside D, E, F (0.2%), and steviolbioside (0.1%).

Benefits in Protein powder
1.Natural Sweetener

- Zero-calorie sweetener: Stevia is a zero-calorie sweetener that can add sweetness to protein powders without adding calories.

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2.Flavor Enhancer

- Masking bitterness: Stevia can help mask the bitterness of some protein sources, making the protein powder more palatable.

Fig 10. Stevia

Liquorice
Family*: Fabaceae*
Genus: Glycyrrhiza
Species: Glycyrrhiza glabra (licorice or liquorice)
Chemical Constituents:
Liquorice primarily contains glycyrrhizin and glycyrrhetic acid, which are triterpenoid saponins, as well as flavonoids like liquiritin, isoliquiritin, and liquiritigenin.
Licorice mainly contains saponins, flavonoids, and polysaccharides; glycyrrhizic acid, glycyrrhetinic acid, and other saponins; liquiritigenin and liquiritin and other flavonoids.
Potential Health Benefits

- Anti-inflammatory effects: The compounds in liquorice root may help reduce inflammation and alleviate symptoms of conditions like arthritis.
- Antioxidant effects: The antioxidants in liquorice root may help protect against oxidative stress and cell damage.

Fig 11. Liquorice

CONCLUSION

herbal protein powders offer a potentially beneficial option for individuals seeking protein supplementation, but it's crucial to be aware of quality concerns and potential risks. The review suggests that stricter regulations and oversight are necessary to ensure the safety and accuracy of these products, according to a study published in Medicine.

Herbal protein powders offer a promising alternative to traditional protein supplements, with potential benefits for overall health and wellness. This review highlights the diversity of herbal protein sources, their nutritional profiles, and potential advantages. While more research is needed to fully understand the efficacy and safety of these products, the existing evidence suggests that herbal protein powders can be a valuable addition to a balanced diet and lifestyle.

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REFERENCE

1. *Abd El-Baset, W.S. & Almoselhy, R.I.M. (2023). Effect of Some Packing Materials on Oxidative Stability of Fats in Date Biscuits. Food Technology Research Journal, 1, 1, 15-25*
2. *Ai, Z., Ren, H., Lin, Y., Sun, W., Yang, Z., Zhang, Y., Zhang, H., Yang, Z., Pandiselvam, R., Liu, Y. (2022). Improving drying efficiency and product quality of Stevia rebaudiana leaves using innovative medium-and short-wave infrared drying (MSWID). Innovative Food Science &Emerging Technologies, 81, 103154.*
3. *Akilen, R., Pimlott, Z., Tsiami, A., Robinson, N. (2013). Effect of short-term administration of cinnamon on blood pressure in patients with prediabetes and type 2 diabetes. Nutrition, 29, 10, 1192-1196.*
4. *Allerton, D.M., West, D.J., Stevenson, E.J. (2021). Whey protein consumption following fasted exercise reduces early postprandial glycaemia in centrally obese males: a randomised controlled trial. EurJNutr 60, 999–1011.*
5. *Almoselhy, R.I.M. (2021a). Extra Virgin Olive Oil as Nutritional Therapeutic Immuno-Enhancer. International Journal of Family Studies, Food Science and Nutrition Health, 2, 2, 26-45.*
6. *Almoselhy, R.I.M. (2021b). A Review of Emerging Health Risks with 3-MCPD Processing Contaminantin Refined Edible Oils. J Microbiol Biotechnol, 6, 3, 000202.*
7. *Dubois, P., Albuquerque, P., Allais, O., Bonnet, C., Bertail. P. et al. (2021). Effects of front-of-pack labelson the nutritional quality of supermarket food purchases: evidence from a large-scale randomized controlled trial. J. of the Acad. Mark. Sci. 49, 119–138.*
8. *Ducrot, P., Julia, C., Méjean, C., Kesse-Guyot, E., Touvier, M., et al. (2016). Impact of Different Front-of-Pack Nutrition Labels on Consumer Purchasing Intentions. American Journal of Preventive Medicine,50, 5, 627-636.*
9. *Egyptian Standards (2007). ES: 2730/2007 PROTEIN-RICH SUPPLEMENTARY FOODS. Egyptian Organization for Standardization and Quality. Arab Republic of Egypt.*
10. *FDA (2013). A Food Labeling Guide: Guidance for Industry. U.S. Department of Health and Human Services, Food and Drug Administration, Center for Food safety and Applied Nutrition.*
11. *Filho, P.A.D.C., Chen, Y., Cavin, C., Galluzzo, R. (2022). Mid-infrared spectroscopy: Screening methodfor analysis of food adulterants in reconstituted skimmed milk powder. Food Control, 136, 108884.*
12. *Flores-Flores, M.E. & González-Peñas, E. (2018). Short communication: Analysis of mycotoxins in Spanish milk. Journal of Dairy Science, 101, 1, 113-117.*
13. *Gantumur, M.A., Sukhbaatar, N., Shi, R., Hu, J., Bilawal, A. et al. (2023). Structural, functional, and physicochemical characterization of fermented whey protein concentrates recovered from various fermented-distilled whey. Food Hydrocolloids, 135, 108130.*
14. *Gardana, C. & Simonetti, P. (2018). Determination of steviol glycosides in commercial extracts of Stevia rebaudiana and sweeteners by ultra-high performance liquid chromatography Orbitrap mass spectrometry. Journal of Chromatography A, 1578,14.*
15. *Giacalone, D., Wendin, K., Kremer, S., Frøst, M.B., Bredie, W.L.P. et al. (2016). Health and quality of life in an aging population – Food and beyond. Food Quality and Preference, 47, B, 166-170.*
16. *Gopinath, B. Russell, J., Flood, V.M., Burlutsky, G., Mitchell, P. (2014). Adherence to Dietary Guidelines Positively Affects Quality of Life and Functional Status of Older Adults, Journal of the Academy of Nutrition and Dietetics, 114, 2, 220-229.*
17. *Hartmann, C., Hieke, S., Taper, C., Siegrist, M. (2018). European consumer healthiness evaluation of 'Free-from' labelled food products. Food Quality and Preference, 68, 377-388.*
18. *Hashem, H., Almoselhy, R.I.M., El-Waseif, M., Magdy, A. (2020) Rapid Authentication of Extra Virgin Olive Oil using UV and FTIR Spectroscopy. Middle East Journal of Applied Sciences, 10, 2, 263-271.*
19. *Henn, M., Babio, N., Romaguera, D., Vázquez-Ruiz, Z., Konieczna, J. et al. (2023). Increase from low to moderate, but not high, caffeinated coffee consumption is associated with favourable changes in body fat. Clinical Nutrition, 42, 4.*
20. *Indian Standards (1976). IS: 8220/1976 Specification for Protein-Rich Concentrated Nutrient Supplementary Foods. Bureau of Indian Standards. India.*