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Development and evaluation of nutraceuticals based instant soup mix powder

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Abstract
The terms "nutrient" and "pharmaceuticals" combine to form the phrase nutraceuticals. AAFCO (1996) defines "nutrient" as a feed ingredient in a form and amount that will support an animal's or human's life, and "nutritraceutical" as any non-toxic food ingredient with scientifically demonstrated health benefits, such as illness prevention and treatment. Foods that have a therapeutic impact on people's health are referred to as nutraceuticals. Probiotics and prebiotics, herbal items, food supplements, and medicinal foods intended for illness prevention and treatment are all included. Older adults frequently struggle with appetite loss, which increases their risk of malnutrition. For the elderly, soup-based product formulation and supplementation is an engaging and practical approach to preserve nutritional status. Therefore, the purpose of this study is to use common agricultural commodities to make ready-to-eat (RTE) soup and quick soup powder. This nutraceutical soup is reach with nutritional values and providing more energy to the body.

Keywords: Nutraceuticals, soup powder, nutrition, energy boost

Introduction
As the world's population ages, one in six individuals will be over 60 by 2050, when the number of elderly people will reach 2.1 billion, according to WHO projections. of them, low- and middle-income nations will account for 80% of the aging population. Nutraceuticals are goods that are used as medications in addition to being used for nutrition. Nutraceuticals can be used to support the body's structure and function, prevent chronic diseases, promote health, and slow down the aging process [1]. The phrase "nutraceutic" is a combination of the words "pharmaceutics" and "nutrition." This expression describes products that are kept apart from herbal products, nutritional supplements, specific diets, and processed foods like cereals, soups, and drinks that double as both pharmaceuticals and dietary supplements [2]. A nutritional supplement for human usage that raises the daily intake of a mineral, vitamin, amino acid, medicinal plant, or other botanical; or a concentrate, metabolite, constituent, extract, or mixture of these elements. Among these nutritional supplements that are utilized for health objectives other than nutrition are called nutraceuticals [3]. Herbal products have been popular since the Decades, as seen by the well-known Hippocrates quotation from 400 BC, "Let food be thy medicine and medicine be thy food" [4]. Numerous historical societies, including the Greek, Roman, Egyptian, and others, employed plants and herbal remedies to cure and prevent illness [5]. Herbal good shave therefore been a fascinating topic throughout human history [6]. Cinnamon represented a great value in both Roman and antient Egyptian civilizations [5].

Fig 1: Nutraceuticals

Classification of Nutraceuticals

1. Traditional Nutraceuticals

- Chemical constituents

a. Nutrients
b. Herbals
c. Phytochemicals
d. Polyunsaturated Fatty Acids (PUFAs)

- ii. Probiotics microorganisms
- iii. Nutraceutical enzymes

2. Non-traditional Nutraceuticals

a. Fortified nutraceuticals
b. Recombinant nutraceuticals [7]

Nutraceutical marketed products

Nutraceutical Tablets
Nutraceutical Candy
Nutraceutical Biscuits
Protein Powder
Protein Bars
Soup Powder

Protein soup powder

The frantic pace of modern life is a result of urbanization. They are growing accustomed to eating fast food and similar items since they do not have enough time to prepare meals. Due to their high sugar, fat, and salt levels as well as their low protein, fiber, vitamin, and mineral content, the majority of these meals qualify as junk food. One benefit of dried soup powders is their ability to maintain their flavor at room temperature for extended periods of time (6–12 months) and their resistance to oxidative and enzymatic spoiling [8].

Advantages of protein soup

- Your gut health may improve.
- You can get a boost of protein.
- Certain soups may have medicinal qualities.
- You can get more nutrients for fewer calories [9]

Materials and Methodology

Materials

1. Chia seeds powder

Biological source: *Salvia hispanica* L.
Family: lamiaceae
Synonyms: Amarant
Chemical constituent: Energy**,** Protein**,** Total lipid**,** Ash**,** Carbohydrate**,** Dietary fibre**,** Calcium**,** Iron**,** Magnesium**,** Potassium.

Fig 2: Chia Seed Powder

Benefits of chia seeds

1. Elevated amounts of omega-3 fatty acids in the blood.
2. An increase in the consumption of fiber [20]

2. Sprouted wheat powder

Family: Gramineae
Synonyms: Germinated wheat powder
Chemical constituent: Carbohydrates, fat, sodium, dietary fiber, protein, calcium, iron, potassium.

Fig 3: Sprouted Wheat Powder

Benefits of eating sprouted wheat

1. You will notice a noticeable difference in your skin and hair after ingesting sprouted wheat.
2. It also has a high fiber content, which contributes to a smooth digestive tract [9]

3. Non sprouted wheat powder

Biological source: Triticum genus of grass
Family: Poaceae
Synonyms: Aata
Chemical constituents: Calories, Water, Protein, Carbs, Sugar, Fiber, Fat: 2.5 grams [10]

Fig 4: Non Sprouted Wheat Powder

Health benefits

1. Reducing Obesity
2. Promote Women's Health [11]

4. Black pepper powder

Biological source: Dry berries of piper nigrum vine
Family: Piperaceae
Synonyms: kali miri
Chemical constituents: Calories, Fat, Carbohydrates, Dietary Fiber, Protein, Vitamin K, Iron, Manganese.

Fig 5: Black Pepper Powder

Benefits of black pepper powder
Antioxidant Propertie
Anti-Inflammatory Effects [12]

Fig 6: Tomato Powder

Tomato powder
Biological source: Solanum Lycopersicum
Family: Solanaceae
Synonyms: Dehydrated tomato powder
Chemical constituent: Moisture, Vitamin C, Lycopene, Iron, Calcium, Phosphorus, Magnesium, Copper, Zinc, Manganese, Sodium, Potassium [13].

Benefits of tomato powder:
1. Rich in Antioxidants
2. Eye Health [14]

5. Cinnamon powder
Biological source: Cinnamomum zeylanicum
Family: Lauraceae
Synonyms: Canella
Chemical constituent: Calories, Fat, Carbs, Calcium, Iron, Potassium, Vitamin A, Vitamin C.

Benefits of cinnamon powder
1. Possesses potent therapeutic qualities
2. Packed with protective agents [15]

Fig 7: Cinnamon Powder

6. Onion powder
Biological source: Allium Cepa
Family: Amaryllidaceae
Synonyms: Dried onion flakes
Chemical constituent: Calories, Fat, Sodium, Carbohydrate, Dietary Fibers, Sugars, Protein, Calcium, Iron, Potassium, Vitamin C

Benefits of Onion powder
1. Promotes Bone Health
2. Good for Hair [16].

Fig 8: Onion powder

7. Fennel powder
Biological source: Foeniculum vulgare
Family: Apiaceae
Synonyms: sweet cumin
Chemical Constituent: Calorie, Fat, Sodium, Carbohydrate, Dietary Fiber, Sugars, Protein, Calcium, Iron, Potassium, Vitamin A, Vitamin C.

Benefits of fennel powder
1. Anti-Diabetic Potential
2. Role in Dysmenorrhea [17].

Fig 9: Fennel Powder

8. Salt
Biological source: Seawater
Family: Chloride
Synonyms: Rock Salt
Chemical Constituent: Sodium, Calcium, Iron, Potassium, Water, Magnesium, Zinc, Copper.

Benefits of salt
1. Enhances Cardiovascular Health
2. Intravenous Saline IV Solution [18]

Fig 10: Salt

9. Baby corn powder
Biological source: Maize Grain
Family: Poaceae
Synonyms: Mini Corn
Chemical Constituent: Fat, Carbohydrate, Dietary Fiber**,** Protein, Iron, Vitamin C, Vitamin A, Fat, Calcium, Calories, Carbohydrates, Insoluble Fiber, Protein, Sodium, Potassium.

Benefits of baby corn powder
1. Low calorie content
2. Helps with digestion [19]

Fig 11: Baby Corn Powder

Preparation of ingredient powder
1. Chia seeds, sprouted wheat, non-sprouted wheat, black pepper, tomato, cinnamon, onion fennel, salt and baby corn individually were dried at sunlight for 24 hours.
2. After that separate ingredient grinded by mixture.
3. then was packed in individual LDPE bag and storage at chilled condition.

Formulation of soup powder
1. weigh all ingredients properly using weighing balance.
2. take mortar and pestle for mix powder.
3. add 6 gm chia seeds powder in mortar and add 4 gm sprouted wheat powder and mix in uniform direction.
4. then add 3 gm non sprouted wheat powder in mixture and stir uniform direction.
5. Take 1gm black pepper powder and mix into powder.
6. after that add 6 gm tomato powder into mixture for taste and colour providing to powder.
7. In that add 1 gm cinnamon powder and 2 gm onion powder into mixture and mix well in to mixture.
8. add 3 gm fennel powder into mixture with uniform stirring.
9. 2 gm baby corn powder add into mixture.
10. lastly add 2 gm salt for providing taste to the powder.
11. mix powder properly until make homogeneous powder.
12. weigh mixed powder in weighing balance and place into air tight container.
13. The formulation of soup powder is ready.

Methodology

Formulation Table

Table 1: Show Ingredients and F1-F5

Sr. No.	Ingredients	F1	F2	F3	F4	F5
1	Chia seeds powder	5gm	6gm	6gm	6gm	6gm
2	Sprouted wheat powder	4gm	4gm	4gm	4gm	4gm
3	Non-sprouted wheat powder	4gm	3gm	3gm	3gm	3gm
4	Black pepper powder	2gm	1gm	1gm	2gm	2gm
5	Tomato powder	5gm	6gm	5gm	3gm	4gm
6	Cinnamon powder	1gm	1gm	1gm	2gm	2gm
7	Onion powder	2gm	2gm	2gm	2gm	2gm
8	Fennel powder	3gm	3gm	3gm	3gm	3gm
9	Salt	2gm	2gm	3gm	3gm	2gm
10	Baby corn powder	2gm	2gm	2gm	2gm	2gm

Results and Discussion
1. Pre-Evaluation: Protein test: Chemicals: sodium hydroxide (NaOH), Copper sulphate (CuSO4)
Presence of protein shows colour range blue to purple.

Table 2: Show Protein Test and Observation

Sr. No.	Protein Test	Observation
1	Chia seeds powder + water + NaOH + $CuSO_4$	Protein present
2	Sprouted wheat powder + water + NaOH + $CuSO_4$	Protein present
3	Non sprouted wheat powder + water + NaOH + $CuSO_4$	Protein present
4	Black pepper powder + water + NaOH + $CuSO_4$	Protein present
5	Tomato powder + water + NaOH + $CuSO_4$	Protein present
6	Cinnamon powder + water + NaOH + $CuSO_4$	Protein present
7	Onion powder + water + NaOH + $CuSO_4$	Protein present
8	Fennel powder + water + NaOH + $CuSO_4$	Protein present
9	Salt + water + NaOH + $CuSO_4$	Protein Absent
10	Baby corn powder + water + NaOH + $CuSO_4$	Protein present

2. Carbohydrate test: Chemicals: fehling's solution
Presence of carbohydrate shows orange to brick red colour.

Table 3: Show Carbohydrate Test and Observation

Sr. No.	Carbohydrate Test	Observation
1	Chia seeds powder +water + Fehling's solution	Carbohydrate present
2	Sprouted wheat powder +water + Fehling's solution	Carbohydrate present
3	Non sprouted wheat powder + water + Fehling's solution	Carbohydrate present
4	Black pepper powder +water + Fehling's solution	Carbohydrate Absent
5	Tomato powder +water + Fehling's solution	Carbohydrate present
6	Cinnamon powder +water + Fehling's solution	Carbohydrate present
7	Onion powder +water + Fehling's solution	Carbohydrate present
8	Fennel powder +water + Fehling's solution	Carbohydrate present
9	Salt +water + Fehling's solution	Carbohydrate Absent
10	Baby corn powder +water + Fehling's solution	Carbohydrate present

Post Evaluation

1. Organoleptic properties

- **Colour:** The colour of the soup powder was analysed against a white background.
- **texture:** The texture of soup powder was inspected by ragged in between fingers.
- **Flavour:** A sensory test was conducted and Sample powder was tasted in small amount

Table 4: Show Test and F1-F5

Test	F1	F2	F3	F4	F5
Colour	Brick red	brown	Brown	Brown	Brown
Texture	Smooth	Smooth	Smooth	Smooth	Smooth
Flavour	Aromatic	Aromatic	Salty	Salty	Aromatic
Ph	6.3	6.1	6.6	6.8	6.4
Bulk density	0.5 g/ml	0.2 g/ml	0.3 g/ml	0.61 g/ml	0.42 g/ml
Tapped density	0.833 g/ml	0.734 g/ml	0.75 g/ml	0.769 g/ml	0.677 g/ml
Angle of repose	39.80 °	27.57 °	29.69 °	28.56 °	30.93 °
Carr's index	39.97 %	20.67%	60%	72.75%	37.96 %
Hausner ratio	1.666	1.260	2.5	3.67	1.611

Conclusion

Nutraceuticals are products generally found all over the world today. All ingredients used in the formulation are herbal so the side effects of the powder are very low. They are easily available in our day-to-day life. Nutraceuticals have proven health benefits and disease prevention capabilities, which should be taken under their acceptable recommended intake. Nutraceutical soup powder has good nutritional property. The several ingredients that make up the nutritional powder are primarily natural ingredients that have no known negative effects. In many situations, nutraceutical goods are superior to synthetic medications that are being developed by the pharmaceutical sector. This ready-to-eat soup may be a fantastic source of nutrition in fast food and a substitute for various other sources of plant proteins used as value-added ingredients. This nutraceutical soup powder is intended to supply the body with nutrients needed to sustain a healthy diet and way of life. After doing post evaluation tests the F2 formulation is best than other formulations.

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