



HERBAL DIETRY NURTIENT BISCUITS

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❖ Abstract :-

This research focuses on the development of a herbal nutrient biscuit incorporating health-promoting ingredients such as moong dal, flax seeds, bajra, agar, milk powder, custard powder, and a sugar-free sweetener. The primary objective is to formulate a functional snack that offers high nutritional value with a low glycemic index, suitable for health-conscious individuals and diabetic patients. Each ingredient was selected based on its individual health benefits—moong dal for its high protein content, flax seeds for omega-3 fatty acids and fiber, bajra for its gluten-free energy boost, and agar for its digestive benefits. The sugar-free tablets serve as a diabetic-friendly sweetener alternative, while milk and custard powder enhance taste and texture. The final product aims to balance health and palatability while contributing to the growing demand for nutraceutical and functional food products

❖ **KEY WORDS:-** Herbal Biscuit , Nutrient-rich Biscuit , Dietary Biscuit , Herbal Formulation , Natural Supplement , Nutraceutical , etc

❖ Introduction :-

In recent years, there has been an increasing consumer demand for functional foods that not only satisfy hunger but also provide health benefits beyond basic nutrition. Biscuits, being a widely consumed snack, present an excellent platform for fortification with health-enhancing ingredients. The present study investigates the development of a herbal nutrient biscuit using a unique blend of natural and functional ingredients including moong dal (*Vigna radiata*), flax seeds (*Linum usitatissimum*), bajra (*Pennisetum glaucum*), agar, sugar-free sweeteners, milk powder, and custard powder. Each of these components has been traditionally used in various cuisines and herbal remedies, and collectively they offer a wide spectrum of nutritional benefits. The aim of this formulation is to deliver a high-protein, high-fiber, low-sugar biscuit that supports digestive health, heart health, and glycemic control. This research not only focuses on the nutritional profiling and health benefits of the ingredients but also evaluates the organoleptic properties and consumer acceptability of the final product. Our Herbal Nutrient Biscuit is a wholesome and health-focused snack, thoughtfully crafted using a blend of nutritious ingredients. Enriched with moong dal, flax seeds, and bajra (pearl millet),

this biscuit offers a rich source of plant-based protein, fiber, and essential minerals. The addition of milk powder and custard powder enhances its creamy texture and taste, while agar provides a natural gelling agent to support digestive health. Sweetened with a sugar-free tablet, this biscuit is a guilt-free delight suitable for health-conscious individuals and diabetics alike. A perfect fusion of tradition and wellness, this biscuit is ideal for those seeking a balanced and nourishing snack.

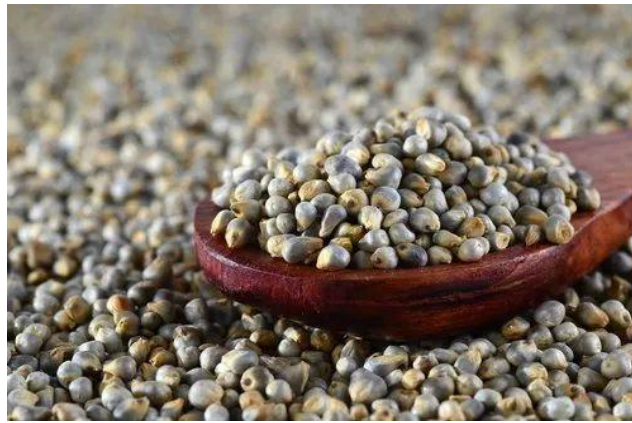
❖ INGREDIENTS :-

- 1.MOONG DAL
- 2.BAJARA
- 3.FLAX SEEDS
- 4.MILK POWDER
- 5.SUGAR FREE TABLET
- 6.AGAR
7. CUSTARD POWDER

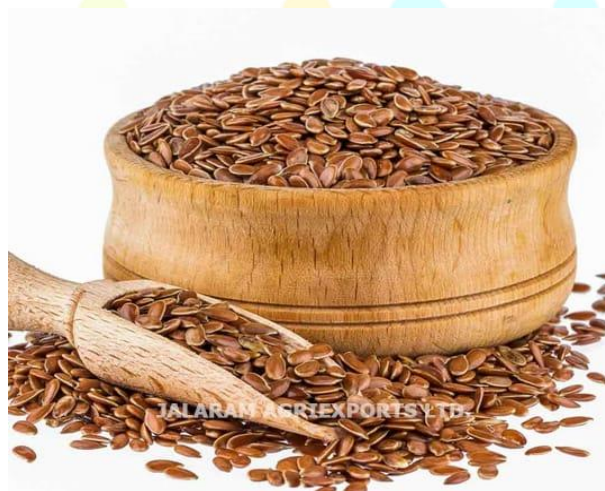
1.MOONG DAL :-



- Biological Source: *Vigna radiata* (formerly *Phaseolus aureus*)
- Family: Fabaceae (Leguminosae)
- Uses: 1) Rich source of protein and dietary fiber
 - 2) Easily digestible and commonly used in Ayurvedic diets
 - 3) Helps in weight management and controlling blood sugar levels
 - 4) Contains antioxidants and supports heart health
 - 5) used in traditional medicine for improving digestion and detoxification

2.BAJARA :-

- Biological Source: Bajara is obtained from the seeds of *Pennisetum glaucum* (synonym: *Cenchrus americanus*).
- Family: Poaceae (also known as Gramineae).
- Parts Used: Mainly the seeds (grains), but in some traditional practices, other parts like the leaves and stems may also be used.
- Uses:- Nutritional: Rich in fiber, iron, magnesium, and essential amino acids; widely consumed as a staple food in arid regions.
- Medicinal: Used traditionally for managing diabetes, constipation, and heart health due to its high fiber and low glycemic index.
- Fodder: The plant is also used as animal feed.
- Agricultural: Drought-resistant crop, ideal for dry climates, improving food security.

3.FLAX SEEDS:-

- Biological Source:- Flax seeds are obtained from the dried, ripe seeds of *Linum usitatissimum*.
- Family:- Linaceae.
- Parts Used:- Seeds (also called linseeds), and sometimes the oil extracted from them.
- Uses: - Nutritional: Rich source of omega-3 fatty acids (especially ALA), lignans (phytoestrogens), and dietary fiber.

- Medicinal:-Acts as a laxative due to high mucilage content.

Used for lowering cholesterol and improving cardiovascular health.

Anti-inflammatory and antioxidant effects.

Cosmetic:- Used in skin care for moisturizing and anti-aging .

- Industrial:- Linseed oil is used in paints, varnishes, and linoleum production.

Traditional medicine: Used in Ayurveda and other systems for treating constipation, cough, and hormonal imbalance.

4. RAGI :-



- Biological Source:- Ragi is the dried grains of Eleusine coracana.
- Family:- Poaceae (Grass family)
- Uses of Ragi:
 1. Nutritional food – rich in calcium, iron, and dietary fiber.
 2. Weaning food – commonly used for infants.
 3. Diabetic-friendly – helps manage blood sugar levels due to low glycemic index.
 4. Gluten-free grain – suitable for people with gluten intolerance.
 5. Bone health – high calcium content supports bone development and strength.

5.MILK POWDER:-



- Biological Source:- Milk powder is derived from milk, which is a natural secretion obtained from the mammary glands of mammals. The most common biological source for milk powder is:
- Cow (*Bos taurus*) – Family: Bovidae
- Other less common sources may include:
- Goat (*Capra hircus*) – Family: Bovidae
- Buffalo (*Bubalus bubalis*) – Family: Bovidae
- Family:- All these animals belong to the Bovidae family.
- Uses of Milk Powder:
 1. Nutritional supplement – rich in proteins, calcium, vitamins.
 2. Infant formulas – used as a substitute for breast milk.
 3. Food industry – in baking, confectionery, beverages.
 4. Pharmaceuticals – as an excipient in tablets or capsules.
 5. Cosmetic industry – in soaps, face masks, and creams for its moisturizing properties.

6.AGAR :-



- Biological Source:- Agar is obtained from the red algae species, primarily:
Gelidium spp.
Gracilaria spp.
- Family:- Gelidiaceae and Gracilariaceae (depending on the species used)

- Uses of Agar:
 1. Microbiology – as a culture medium for growing microorganisms.
 2. Food industry – as a vegetarian gelatin substitute, thickener, and stabilizer.
 3. Pharmaceuticals – used as a laxative and in tablet formulation.
 4. Cosmetics – as a gelling agent in creams and lotions.
 5. Biotechnology – in electrophoresis and tissue culture media.

7. SUGAR FREE TABLET :-



- Biological Source:-Depends on the type of sweetener used. Common ones include:
 1. Stevia (natural) – derived from the leaves of *Stevia rebaudiana*
 2. Aspartame, Sucralose, Saccharin – synthetic compounds (not directly from a biological source)

For natural sugar-free tablets (like those containing stevia):

- Biological Source: *Stevia rebaudiana*
- Family: Asteraceae
- Uses of Sugar-Free Tablets:
 1. Diabetic diet – alternative to sugar for managing blood glucose.
 2. Weight management – low or zero calories.
 3. Dental health – does not promote tooth decay.
 4. Pharmaceuticals – used as sweeteners in tablets/syrups.
 5. Food and beverages – in soft drinks, desserts, and processed foods.

7. CUSTARD POWDER :-



- **Biological Source:-** Custard powder is typically made from cornstarch, which is derived from the seeds of maize (corn) – Zea mays.
- **Family:-** Poaceae (Grass family)
- **Uses of Custard Powder:**
 1. Food industry – used to make custard, a sweet dessert thickened with milk.
 2. Thickening agent – in puddings, sauces, and gravies.
 3. Bakery products – for filling and flavoring pastries and cakes.
 4. Instant dessert mix – easy preparation of creamy desserts at home.

❖ **Authentification method :-**

The authentification of food ingredients is crucial to ensure purity and nutritional value. Among the staples .

- Moong dal stands out as a rich source of protein and fiber.
- Flax seeds (commonly misspelled as fax seed) are valued for their omega-3 fatty acids and antioxidant properties. Traditional grains like
- Ragi and Bajra are powerhouses of calcium, iron, and complex carbohydrates. In processed foods,
- Agar serves as a natural thickening agent, especially in vegetarian products.
- Milk powder is widely used for its long shelf life and convenience, while
- Custard powder adds texture and flavor to desserts. For calorie-conscious individuals.
- Sugar-free tablets provide sweetness without the added sugars, making them ideal for diabetics and fitness enthusiasts. Each of these items, when authenticated and used correctly, contributes to a balanced and health-conscious diet.

Here's a concise summary on herbal ingredient authentication for the listed items:

➤ **Notes on Authentication Methods:**

- **Macroscopy & Microscopy:** First line of identification for plant-based materials.

- TLC/HPTLC (Thin Layer Chromatography): Used for fingerprinting active constituents.
- DNA Barcoding: Accurate for identifying species, especially in powdered form.
- Chemical Tests: Specific tests like iodine for starch or mucilage swelling index.

❖ **Formulation :-**

Ingredient	Quantity(g)	Function
Moong dal Flour	25	Protein Source , Structure
Flax seed Powder	10	Natural Binder
Ragi Flour	20	Calcium , Iron, Fiber
Bajara Flour	20	Complex Carbs, Protein
Milk Powder	20	Protein,Calcium
Agar Powder	1	Natural Gelling Agent
Sugar Free Tablet	4	Sweetner Adjust As Per Target
Water/Milk	As required	Dough Binding
Custard Powder	As required	Flavourance

A basic formulation for a herbal nutrient biscuit using moong dal, flax seed, ragi, bajra, agar, milk powder, and custard powder. This can serve as a nutritious, high-fiber, and protein-rich snack:

Herbal Nutrient Biscuit Formulation (Per 100g batch)

❖ **Procedure For Powder :-**

1. Dry Roasting (Optional): Lightly roast moong dal flour, ragi, bajra, and flax seed powder for enhanced aroma and digestibility. Let cool.
2. Mixing: In a bowl, combine all dry ingredients including custard powder, agar powder, milk powder, baking powder, and spices.
3. Fat Incorporation: Rub in butter or ghee until the mixture resembles coarse crumbs.
4. Binding: Add water or milk slowly to form a soft dough. Do not over-knead.
5. Resting: Let the dough rest for 15–20 minutes covered.
6. Shaping: Roll out dough and cut into desired biscuit shapes.
7. Baking: Bake at 160–170°C for 15–20 minutes or until golden brown.
8. Cooling & Storage: Cool completely and store in an airtight container.

❖ **Procedure For Herbal Biscuit :-**

Ingredients (quantities can be adjusted as per batch size):-

1. Moong dal – 25g (roasted and powdered)
2. Flax seeds – 20g (roasted and powdered)
3. Ragi (finger millet) flour – 20g
4. Bajra (pearl millet) flour – 20g
5. Milk powder – 20g
6. Custard powder – As required
7. Agar-agar – 1g (as a binder)
8. Tup (ghee) – As required
9. Water – As needed

1. Preparation of Powders:-



Roast moong dal and flax seeds separately until aromatic. Cool and grind to a fine powder.

If not already powdered, ensure ragi and bajra are in flour form.

2. Binding Mixture:-Dissolve agar-agar in a small amount of hot water and allow it to cool slightly



3. Mixing Dry Ingredients:-

In a large bowl, combine moong dal powder, flaxseed powder, ragi flour, bajra flour, milk powder, and custard powder.



4. Incorporating Fat:-

Add melted ghee (tup) into the dry mixture and mix until crumbly.



5. Forming Dough:-

Add the dissolved agar and small amounts of water gradually.
Mix to form a soft but firm dough. Avoid making it too sticky.



6. Shaping Biscuits:-

Roll out the dough to about ½ cm thickness.
Cut into desired shapes using a cookie cutter.



7. Baking:-

Preheat oven to 160°C (320°F).
Place biscuits on a greased or lined baking tray.



Bake for 15–20 minutes or until the edges turn golden brown.
Cool completely before storing.



❖ Evaluation Test for Herbal Nutrient Biscuit : -

1. Physical Evaluation:-

Weight: Use a digital balance to measure uniformity of biscuit weight.

Diameter & Thickness: Use Vernier caliper for accurate size measurement.

Spread Ratio: Calculate as $\text{Diameter} \div \text{Thickness}$.

Color: Observe visually or with a colorimeter; should be golden to light brown.

Texture: Assess manually or using a texture analyzer (crispness, hardness).

Appearance: Look for surface cracks, shape uniformity, and overall visual appeal.

2. Chemical/Nutritional Evaluation :-

Moisture Content: Determines shelf life; test using hot air oven method.

Ash Content: Indicates total mineral content.

Protein Content: Especially from moong dal and milk powder – test via Kjeldahl method.

Fat Content: Comes mainly from ghee and flaxseed – test using Soxhlet method.

Carbohydrate Content: Calculate by difference method.

Crude Fiber: High due to ragi, bajra, flaxseed – test using standard AOAC method.

Energy Value: Calculate using standard Atwater factors (Protein, Fat, Carb).

3. Sensory Evaluation :-

Conducted with 10–15 semi-trained panelists using a 9-point hedonic scale.

Appearance: Uniform, attractive surface.

Color: Golden-brown or natural cereal tone.

Aroma: Mild nutty or ghee aroma, no off-odors.

Taste: Balanced sweetness, mild grain flavor, no bitterness.

Texture/Mouthfeel: Crisp or soft as intended.

Overall Acceptability: General consumer liking.

4. Microbiological Evaluation (Optional/Shelf-Life Study)

Total Plate Count: Indicates bacterial load.

Yeast and Mold Count: Important for dry bakery items.

Coliforms: Should be absent – indicates hygiene

❖ **Role of Herbal Nutrient Dietary Biscuit:-**

Herbal nutrient dietary biscuits play a dual role as both a convenient snack and a functional food. They are formulated with medicinal herbs and nutrient-dense ingredients, offering a natural alternative to conventional processed snacks. These biscuits serve the following roles:

1. **Nutritional Supplementation:** Provide essential nutrients such as fiber, protein, vitamins, and minerals to support overall health.
2. **Therapeutic Benefits:** Herbs like Tulsi, Moringa, Ashwagandha, and Neem impart therapeutic properties—antioxidant, anti-inflammatory, adaptogenic, or antimicrobial.
3. **Health Maintenance:** Help manage or prevent common health issues such as indigestion, fatigue, weakened immunity, and oxidative stress.
4. **Functional Food Alternative:** Act as a practical delivery system for nutraceuticals and phytochemicals in daily diets.

5. Support for Lifestyle Diseases: Can be tailored for specific conditions like diabetes, obesity, or hypertension using low-GI ingredients and targeted herbs.

6. Consumer-Friendly Format: Offer a tasty, easy-to-carry, and shelf-stable form of herbal supplementation, encouraging better adherence to health goals.

❖ Conclusion:-

The development of the herbal nutrient dietary biscuit demonstrates the potential of integrating natural herbs and nutritious ingredients into a convenient, palatable food product. The formulation not only offers essential macronutrients but also incorporates the therapeutic benefits of medicinal herbs, promoting overall health and wellness. Sensory evaluation and nutritional analysis confirmed its acceptability and effectiveness as a functional food. With growing consumer interest in health-conscious alternatives, this biscuit could serve as a valuable addition to the dietary regimen, particularly for individuals seeking natural, plant-based supplementation. Further research and clinical trials can help validate its long-term benefits and optimize its formulation.

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