

# To Evaluation of Nutritive Biscuit with Herbal Extract

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**Abstract:** *The growing demand for functional foods has encouraged the development of nutritionally enhanced bakery products. This project aims to formulate and evaluate a nutritive biscuit enriched with selected herbal extracts to improve its health benefits without compromising sensory qualities. Herbal extracts such as Moringa oleifera, Ocimum sanctum (Tulsi), and Zingiber officinale (Ginger) were incorporated into the biscuit formulation due to their known antioxidant, antimicrobial, and therapeutic properties.*

*The biscuits were prepared using standard baking procedures, replacing part of the wheat flour with varying concentrations of herbal powders. A comprehensive analysis was conducted, including proximate composition (moisture, protein, fat, ash, fiber, and carbohydrate), phytochemical screening, and antioxidant activity. Sensory evaluation was carried out by a panel to assess taste, texture, aroma, and overall acceptability.*

*Results showed that the herbal-enriched biscuits had improved nutritional value, particularly in terms of fiber content and antioxidant potential, compared to the control. Sensory analysis indicated good consumer acceptability at optimal herbal extract levels.*

*This study concludes that incorporating medicinal herbs into biscuits is a viable strategy to develop functional snacks with enhanced health benefits, catering to the growing interest in natural and health-promoting food products.*

**Keywords:** bakery products

## I. INTRODUCTION

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.

ajra (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. 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. 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.

Nutraceuticals are food products considered as pharmaceutical alternatives with physiological or medicinal benefits, which help improve body functions, prevent various health conditions, increase life expectancy, maintain body cell integrity, as well as support body structure. Consumed by a good range of population due to low moisture content and free from microbial spoilage, their varied taste, long period, and comparatively low cost. The white flour used for the assembly of biscuits is deficient in several nutrients including some vitamins, mineral elements also dietary fiber. Due to competition with in the market and increased demand for



healthy, natural, and functional products, attempts are being made to enhance the nutritive value of biscuits and functionality by modifying their nutritive composition, 2

Herbs are therapeutic plants that contain substances that actively hinder the growth of microorganisms, hence reducing or eliminating health problems. Because of their nutritious value, flavour, compactness, and convenience, biscuits are perfect. Biscuits often have a longer shelf life and are more resistant to microbial decomposition than cakes and bread because they contain less moisture. In terms of baked goods worldwide, biscuits comprise the greatest category of nutrient-dense snack foods. Because they are portable, have a longer shelf life, taste good, and are cheaply produced, biscuits are becoming a popular ready-to-eat product for all age groups. Biscuits consist of three major components: flour, sugar.

#### Aim :

The primary aim of evaluating nutritive biscuits with herbal extracts is to assess the biscuits' nutritional content and sensory attributes after incorporating herbal ingredients. This includes determining the effectiveness of the herbal extracts in enhancing the nutritional profile, such as increased protein, fiber, or antioxidant activity, while also evaluating their impact on the biscuits' texture, taste, and overall acceptability.

#### Objective :

- To formulate a nutritive biscuit by incorporating selected herbal extracts known for their health-promoting properties.
- 2. To evaluate the nutritional composition of the herbal-enriched biscuit, including macronutrients (carbohydrates, proteins, fats) and micronutrients (fiber, minerals).
- 3. To analyze the phytochemical content (such as antioxidants, flavonoids, and phenolics) of the herbal extract and the final biscuit product.
- 4. To assess the sensory attributes (taste, texture, aroma, color, and overall acceptability) of the herbal biscuits through panel testing.
- 5. To compare the nutritional and sensory properties of the herbal biscuit with a standard (control) biscuit without herbal additives.

#### Material and method :

- 1) Dried turmeric powder 2) mint leaves The 3) dry ginger powder 4) wheat flour 5) salt 6) Honey 7) Cinnamon 8) Cardamom 9) Homemade butter 10) Brown Sugar 11) Lemon juice.

1. Dried turmeric :



Dried turmeric powder can be used in biscuits for both color and flavor, adding a vibrant golden hue and a warm, earthy taste. It's a natural coloring agent and can also enhance the flavor of savory or even sweet biscuits, according to antimicrobial properties.

#### Chemical constituent :

It consists of curcuminoids It consists of Volatile Oils Health Benefits :

1. Antioxidants:



Turmeric's main active compound, curcumin, is a powerful antioxidant that helps neutralize free radicals in the body.

## 2. Anti-inflammatory:

Turmeric has anti-inflammatory properties, which can help reduce inflammation in the body.

## 3. Vitamins and Minerals:

Turmeric contains essential vitamins and minerals, including iron, potassium, and vitamin C. Turmeric is a good source of dietary fiber, which is beneficial for digestive health.

## 2) Mints :



Mint leaves, known as "pudina" in India, are a versatile herb used for both culinary and medicinal purposes. They are known for their refreshing aroma, cooling taste, and various health benefits. Mint leaves are used in a wide array of dishes, from chutneys and raitas to biryani and teas.

### Chemical constituent

**Menthol:** The most abundant compound in peppermint, contributing to its cooling sensation and characteristic aroma.

**Menthone:** Another major monoterpene, also present in significant amounts.

**1,8-Cineole (Eucalyptol):** A component with antimicrobial properties.

**Limone:** A terpene that contributes to the overall flavor profile.

**Menthofuran:** Another monoterpene found in mint oil.

### Benefit :

**Digestive Aid:** Mint leaves can help relieve digestive issues like bloating, gas, and indigestion.

**Oral Health:** Chewing mint leaves can help freshen breath and improve oral hygiene.

**Antioxidant Properties:** Mint leaves contain antioxidants that can help protect cells from damage.

**Stress Relief:** The aroma of mint can have a calming effect on the mind and body, helping to reduce stress.

**Immunity Boost:** Mint leaves contain vitamins and minerals that can help boost the immune system.

**Cough Relief:** Mint leaves can help soothe coughs due to their menthol content, which has soothing and decongestant properties.

## 3) Wheat flour :

The reserve proteins from wheat, i.e. the gluten proteins, are responsible for the dough-forming capacity of wheat flour. Gluten permits the retention of gas bubbles during baking of a dough to give open textured and pleasurable eating products.





**Chemical constituent :**

W heat flour used in biscuits primarily consists of starch, water, and protein, with smaller amounts of non-starch polysaccharides and other minor constituents.

**Benefits.**

**Sustained Energy:**

W heat flour provides complex carbohydrates that break down slowly, releasing energy gradually and preventing blood sugar spikes and crashes.

**Nutrient Rich:**

W heat flour contains essential nutrients like B vitamins (thiamine, riboflavin, niacin, and folate), iron, magnesium, and zinc.

**Improved Digestion:**

The fiber in wheat flour promotes healthy digestion, helps regulate bowel movements, and may lower cholesterol levels.

**Blood Sugar Control:**

The fiber and complex carbohydrates in wheat flour help regulate blood sugar levels.

**4) Salt:**



Salt, by its very nature, helps to strengthen the gluten fibres so that they become stronger, which helps to create a more beautiful shape in your Biscuit

**Chemical constituent.**

The primary chemical constituent of salt used in biscuit baking is sodium chloride (NaCl), which is commonly known as table salt. However, depending on the source and processing, table salt may also contain trace amounts of other compounds like calcium and magnesium.

**Benefit:**

**1. Flavor Enhancement:**



Salt intensifies the flavor of other ingredients, making the biscuits taste richer and more savory.

#### 2. Sweetness Balance:

In sweet biscuits, salt helps to balance the sweetness, preventing it from being overwhelming.

#### 3. Texture Impact:

Salt can affect the texture of biscuits. It can help to create a crisper, more brittle texture or a more tender, less dense texture, depending on the recipe and the amount of salt used.

#### 4. Preservation:

Salt can act as a preservative by inhibiting the growth of bacteria and other microorganisms, helping to extend the shelf life of the biscuits.

#### 5) Dry ginger powder :

Dry ginger powder, also known as saunth powder, is commonly used in baking, especially for biscuits and gingerbread cookies, to add a warm, spicy flavor. It's a versatile spice that can enhance various baked goods.



Chemical constituent :

Dry ginger powder used in biscuits contains volatile and non-volatile chemical constituents. Volatile oils like zingiberene,  $\beta$ -bisabolene, and camphene contribute to its aroma, while non-volatile compounds like gingerols (especially 6-gingerol) and shogaols, which are formed when dried or cooked, contribute to its taste. Other constituents include flavonoids, phenolic acids, amino acids, polysaccharides, lipids, vitamins (B3, B6, C), and minerals (calcium, magnesium, potassium, iron, zinc). These compounds contribute to various health benefits, including digestive aid, anti-inflammatory, and antioxidant properties.

#### Benefit

Eating ginger biscuits can prove to be beneficial for one's health. Ginger has anti-inflammatory properties and can help with digestion and nausea.

#### 6) Cinnamon :



Cinnamon There is just the right amount of cinnamon flavor in each bite. Add cinnamon to the melted butter and add some more on top of the biscuits.



Chemical constituent :

Cinnamaldehyde:

This is the main compound, accounting for the spicy and aromatic flavor of cinnamon.

Eugenol:

Contributes to the overall flavor and has potential antioxidant properties. Cinnamic Acid :

Another aromatic compound that can contribute to the taste and

potential health benefits. Other Compounds:

Cinnamon also contains various essential oils, terpenes, and other compounds that contribute to its overall flavor and properties.

Benefits :

1. Antioxidant Properties:

Cinnamon is rich in antioxidants, which help protect cells from damage and may reduce the risk of chronic diseases.

2. Anti-inflammatory:

Cinnamon has anti-inflammatory properties that may help reduce inflammation in the body.

3. Blood Sugar Regulation:

Some studies suggest cinnamon may help regulate blood sugar levels and improve insulin sensitivity, potentially benefiting individuals with diabetes.

4. Gut Health :

Cinnamon may have prebiotic properties that support the growth of beneficial gut bacteria.

5. Other Potential Benefits:

Research also suggests cinnamon may have antimicrobial, anti-diabetic, and brain-boosting effects.

7) Cardamom :



Cardamom is a spice derived from the seeds of several plants in the ginger family (Zingiberaceae). It's known for its distinct aroma and flavor, and is used in both culinary and medicinal contexts. In Indian cuisine, it's a common ingredient in dishes like biryani, kheer, and masala chai. Cardamom is also valued for its potential health benefits, including aiding digestion, improving blood circulation, and acting as an antioxidant.

Benefits :

1. Digestive Aid:

Cardamom is known for its ability to stimulate bile production, which helps break down fats and improve digestion. It also has carminative properties that can reduce bloating and gas.

2. Immune System Support:

Cardamom contains antioxidants that help protect the body from damage caused by free radicals. It also has anti-inflammatory properties, which can help reduce inflammation and support overall immune function.

Enhanced Flavor and Aroma:

Cardamom adds a unique and aromatic flavor to biscuits, making them more enjoyable and appealing.

Chemical constituent :





Card am om 's chem ical com position p rim arily includ es essentia l oils, protein s, fixed oils, and sta rch.

8) Home made butter :



H ig h-fat butter, such as Kerrygold Bu tter, is b est. Th e rich fat from the b utter releases w ater wh en th e b iscuits a re b aking w hich is w hat contrib utes to th e b eautiful layers an d flakiness that we love ab out b iscuits.

Benefit :

1. Texture and Structure:

Butter, pa rticularly w hen u sed cold, help s create a flaky, layered texture in b iscuits by p reventing the flour from form ing a continuous, d ense structure. Th is results in a lig ht an d airy b iscuit.

2. Flavor:

Butter add s a chara cteristic b uttery flavor that enhances the taste of the b iscuit a nd com p lem ents oth er ingred ients.

3. M oisture:

Butter contrib utes to a m oist and tender b iscuit, preventing it from b ecom ing dry or crum b ly.

4. Sp read and T extu re:

Butter's lower m eltin g p oint com p ared to other fats allow s b iscuits to sp read even ly w hile baking , resu lting in a d esired crisp edg e a nd soft center.

5. Richness:

Butter ad d s a richness to the b iscu it that is d ifficult to rep licate w ith other fats.

Chemical constituent :

m ilk fat, water, salt, and m ilk solid s.

9) Brown Sugar :



Brow n sug ar is a p artially refined su gar with a rich flavor a nd caram el-like ta ste, resulting from th e ad d ition of m olasses to refined w hite sug ar. It is a natural sw eetener, retaining its b rown color from the m ola sses. Brown su gar is availa ble in lig ht and d ark varieties, w ith dark b row n sug ar conta ining m ore m olasses a nd ha ving a deeper color a nd flavor.

Chemical constituent :

Brow n su gar's m a in ch em ical constituent is su crose ( $C_{12}H_{22}O_{11}$ ), a d isa ccharide. It also contains m ola ssesal



Benefits :

1. Enhanced Flavor:

Brown sugar's molasses content provides a unique caramel-like flavor that complements other ingredients in the biscuit recipe.

1. Moisture and Texture:

2. The moisture in brown sugar creates a softer, chewier texture in the biscuit, compared to the potentially crisper texture of biscuits made with white sugar.

1. Reaction with Baking Soda:

Brown sugar's acidity reacts more readily with baking soda, which can help biscuits rise more and create a lighter, more tender crumb.

1. Shelf Life:

Brown sugar can also help extend the shelf life of biscuits by retaining moisture, according to some sources.

10) Honey:-



Honey offers several health benefits, from providing antioxidants to reducing inflammation and soothing sore throats. However, honey is still a source of added sugar in your diet, and it's not a good idea to consume them in large amounts.

Chemical constituent :

If Honey, used as a sweetener in biscuits, is primarily composed of carbohydrates (sugars), water, and minor amounts of other substances like minerals, vitamins, and proteins.

Benefit :

Texture:

Honey's humectant properties help retain moisture, resulting in a softer and more tender biscuit texture.

Shelf Life:

Honey's natural properties can help prevent the biscuit from going stale as quickly. Nutrients:

Honey adds antioxidants and other beneficial nutrients that are absent in refined sugar.

Flavor:

Honey contributes a unique flavor profile to biscuits, which can be appealing to many.

Improved Sensory Properties:

Studies have shown that honey can improve the sensory acceptability of biscuits, making them more appealing to consumers.

Antioxidant Content:

Honey can increase the antioxidant content of biscuit fillings.





11) Lemon juice :



Lemons contain a high amount of vitamin C, soluble fiber, and plant compounds that give them a number of health benefits. Lemons may aid weight loss and reduce your risk of heart disease, anemia, kidney stones, digestive issues, and cancer.

Benefit :

1. Flavor and Acidity: Lemon juice adds a bright, tangy flavor that complements sweet and savory biscuit recipes. It can help to balance the sweetness of other ingredients.

The acidity in lemon juice can tenderize the dough and contribute to a unique texture.

2. Leavening (Raising the Biscuits):

Lemon juice is an acidic ingredient that reacts with baking soda (or baking powder), which is a leavening agent.

This reaction produces carbon dioxide gas, which creates bubbles and helps the biscuits rise during baking.

Flavor Enhancement – Add tartness and brightness to dishes and beverages.

2. Preservation – Prevent browning in fruits and vegetables due to its citric acid content.

3. Tenderizing – Soften meat proteins in marinades.

4. Balancing Acidity – Balance sweet or fatty ingredients in recipes.

□ Health & Nutritional Objectives

1. Boost Vitamin C Intake – Support immune system and skin health.

2. Aid Digestion – Stimulate digestive enzymes and relieve bloating.

3. Detoxification – Used in detox drinks to flush toxins.

4. Hydration Support – Encourage increased water intake when added to water.

Sr. no.	Ingredients	Quantity
1.	Dried Turmeric	3 sticks
2.	Mint Leaves	Handful
3.	Wheat Flour	25gm
4.	Salt	1-2gm
5.	Dry Ginger Powder	1gm
6.	Cinnamon	1gm
7.	Cardamom	1g
8.	Home made Butter	10gm
9.	Brown Sugar	20gm
10.	Honey	5ml
11.	Lemon Juice	1ml



Method :

Take a mixer jar grind dried turmeric 3 sticks and mint leaves handful.



Add butter 10gm in a mixing bowl and add brown Sugar 20gm and combine well.



Add honey 5g into the mix well



Pour Lemon juice 1ml and mix



Sift wheat flour 25gm ,salt 1/2 gm , cinnamon powder 1gm, dried ginger powder 1 gm and cardamom powder 1 gm and mix well



Add turmeric mix and make a dough



Place dough on butter paper and roll out the dough with rolling pin



Cut the dough with cookies cutter and place on the beaking trays line with butter paper



Beak at 150°C for 20-25 minutes in a pree heated oven



Keep the biscuit in tray it self for 10 minutes



Store biscuit in air tite container.

Result :-



## II. CONCLUSION

Biscuits are used world wide for th eir hea lth value and can be stored for a long . Th e prod uction of biscuits in Ind ia is a m ajor foodnd ustry. Availab le in a variety of shap es, filling s, colours, and top ping s, biscuits a re p op ular with consum ers of a ll ag es.



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