IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 11, May 2025
Impact Factor: 7.67

To Evaluation of Nutritive Biscuit with Herbal Extract

Gunjawale Varsha Gopinath, Ghuge Rutuja Keshav, Adale Shubhangi Babasaheb, Dr. Chavan D.K .
Aditya Pharmacy College, Beed. Maharashtra. India

Abstract: *This research focuses on the development of a herbal nutrient biscuit incorporating health-promoting ingredients such as dried turmeric, mint leaves, wheat flour, salt, dry ginger powder, cinnamon, cardamom, honey, leamon juice, brown sugar, homemade butter. 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. The final product aims to balance health and palatability while contributing to the growing demand for nutraceutical and functional food products.*

Stress and fast life is major cause of many diseases. Withania somnifera is herb rich in micronutrient which reduce stress and depression. The aim of present study is to formulate cookies enriched with Withania somnifera herb. The value added cookies samples were prepared in four different ratio and combination: W0, WC1, WC2 and WC3. Each experiment was replicated five times. The sensory value was determined by 9-point hedonic scale of 10 panel judges expert in food technology. Nutritional and proximate value were determined by AOAC method (2010). All data were statistically analyzed using standard deviation techniques. The sensory value of different cookies reflects..

Keywords: herbal nutrient biscuit

I. 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. 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. 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 within 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.

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

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 11, May 2025
Impact Factor: 7.67

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 priced, biscuits are becoming a popular ready-to-eat product for all age groups. Biscuits consist of three major components: flour, sugar and fat.

The present investigation was planned to develop a product with high fiber content and low caloric value.

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:

The primary objective of evaluating a nutritive biscuit with herbal extracts is to determine its nutritional value and overall quality, ensuring it meets specific nutritional requirements and is acceptable to consumers. This evaluation aims to verify the presence of beneficial compounds, analyze the biscuit's nutritional composition, and assess its sensory attributes.

Material and Method:

1. Dried turmeric powder
2. Mint leaves
3. Dry ginger powder
4. Wheat flour
5. Salt
6. Honey
7. Cinnamon
8. Cardamom
9. Homemade butter
10. Brown sugar
11. Leamon juice

1) Dried Turmeric Powder

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, along with antimicrobial properties.

Chemical Constituents:

• Curcuminoids

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 11, May 2025
Impact Factor: 7.67

• 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.

4. Dietary Fiber:

Turmeric is a good source of dietary fiber, beneficial for digestive health.

2) Mint Leaves

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 is used in a wide array of dishes, from chutneys and raitas to biryanis and teas.

Chemical Constituents:

• Menthol: The most abundant compound in peppermint, contributing to its cooling sensation and aroma.
• Menthone: Another major monoterpene present in significant amounts.
• 1,8-Cineole (Eucalyptol): Provides antimicrobial properties.
• Limonene: A terpene contributing to the flavor profile.
• Menthofuran: Another monoterpene found in mint oil.

Benefits:

• Digestive Aid: Helps relieve digestive issues like bloating, gas, and indigestion.
• Oral Health: Freshens breath and improves oral hygiene.
• Antioxidant Properties: Protects cells from damage.
• Stress Relief: The aroma has a calming effect, reducing stress.
• Immunity Boost: Contains vitamins and minerals that help support the immune system.
• Cough Relief: Soothes coughs due to menthol's decongestant properties.

3) Wheat Flour

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 11, May 2025
Impact Factor: 7.67

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

Chemical Constituents:

Primarily consists of starch, water, and protein, with smaller amounts of non-starch polysaccharides and other minor constituents.

Benefits:

• Sustained Energy: Provides complex carbohydrates that release energy gradually, preventing blood sugar spikes.
• Nutrient-Rich: Contains B vitamins (thiamine, riboflavin, niacin, folate), iron, magnesium, and zinc.
• Improved Digestion: Fiber promotes healthy digestion, regular bowel movements, and may lower cholesterol.
• Blood Sugar Control: Fiber and complex carbs help regulate blood sugar levels.

4) Salt

Salt strengthens gluten fibers, helping to create a better texture and structure in biscuits.

Chemical Constituents:

Primarily sodium chloride (NaCl), with possible trace amounts of calcium and magnesium depending on source and processing.

Benefits:

1. Flavor Enhancement: Intensifies the flavor of ingredients.
2. Sweetness Balance: Balances sweetness in sweet biscuits.
3. Texture Impact: Affects biscuit texture—can make it crisper or more tender depending on the recipe.
4. Preservation: Acts as a preservative by inhibiting bacterial and microbial growth.

5) Dry Ginger Powder

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

Chemical Constituents:

• Volatile oils: Zingiberene, β-bisabolene, camphene
• Non-volatile compounds: Gingerols (especially 6-gingerol), shogaols
• Others: Flavonoids, phenolic acids, amino acids, polysaccharides, lipids, vitamins (B3, B6, C), minerals (calcium, magnesium, potassium, iron, zinc)

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 11, May 2025
Impact Factor: 7.67

Benefits:

• Anti-inflammatory: Helps reduce inflammation.
• Digestive Aid: Eases digestion and nausea.
• Antioxidant Properties: Protects against oxidative stress.

6) 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 Constituents:

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:

Antioxidant Properties:
Cinnamon is rich in antioxidants, which help protect cells from damage and may reduce the risk of chronic diseases.
Anti-inflammatory:
Cinnamon has anti-inflammatory properties that may help reduce inflammation in the body.
Blood Sugar Regulation:
Some studies suggest cinnamon may help regulate blood sugar levels and improve insulin sensitivity, potentially benefiting individuals with diabetes.
Gut Health:
Cinnamon may have prebiotic properties that support the growth of beneficial gut bacteria.
Other Potential Benefits:
Research also suggests cinnamon may have antimicrobial, anti-diabetic, and brain-boosting effects.

7. Cardamom

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 11, May 2025
Impact Factor: 7.67

Uses in Biscuits:
Provides a distinctive aroma and enhances flavor. Widely used in Indian desserts and teas.
Chemical Constituents:
Essential oils
Proteins
Fixed oils
Starch
Health Benefits:
Digestive Aid: Stimulates bile production and reduces gas.
Immune Support: Contains antioxidants and has anti-inflammatory effects.
Flavor Enhancement

8. Homemade Butter

Uses in Biscuits:
Essential for creating flakiness and rich flavor.
Chemical Constituents:
Milk fat
Water
Salt
Milk solids

Health Benefits:
Texture and Structure: Promotes flakiness and layering.
Flavor: Adds a rich, buttery taste.
Moisture: Prevents dryness.
Spread and Texture: Helps even baking.
Richness

9. Brown Sugar

Brown sugar is a partially refined sugar with a rich flavor and caramel-like taste, resulting from the addition of molasses to refined white sugar. It is a natural sweetener, retaining its brown color from the molasses. Brown sugar is available in light and dark varieties, with dark brown sugar containing more molasses and having a deeper color and flavor.
Chemical Constituent:

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 11, May 2025
Impact Factor: 7.67

Brown sugar's main chemical constituent is sucrose ($C_{12}H_{22}O_{11}$), a disaccharide. It also contains molasses.

Benefits:

1. **Enhanced Flavor:**
   Brown sugar's molasses content provides a unique caramel-like flavor that complements other ingredients in the biscuit recipe.
2. **Moisture and Texture:**
   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.
3. **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.
4. **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 advisable to consume it in large amounts.

Chemical Constituent:

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.

Benefits:

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.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 11, May 2025
Impact Factor: 7.67

Benefits:

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.

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.

Ingredients table:

Sr. no.	Ingredients	Quantity
1.	Dried Turmeric	3 sticks
2.	Mint Leaves	Handful
3.	Wheat Flour	300 gm
4.	Salt	1-2 tsp
5.	Dry Ginger Powder	1 tsp
6.	Cinnamon	1 tsp
7.	Cardamom	1 tsp
8.	Homemade Butter	120 gm
9.	Brown Sugar	60 gm
10.	Honey	80 gm
11.	Lemon Juice	1 tsp

Method:

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

↓

Add butter 120g in a mixing bowl and add brown sugar 60g and combine well.

↓

Add honey 80g and mix well.

↓

Pour lemon juice 1 tsp and mix.

↓

Sift wheat flour 300g, salt 1/2 tsp, cinnamon powder 1 tsp, dried ginger powder 1 tsp, and cardamom powder 1 tsp and mix well.

↓

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 11, May 2025
Impact Factor: 7.67

Add turmeric mix and make a dough.

↓

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

↓

Cut the dough with cookie cutters and place on baking trays lined with butter paper.

↓

Bake at 150°C for 20-25 minutes in a preheated oven.

↓

Keep the biscuit in the tray itself for 10 minutes.

↓

Store biscuits in an airtight container.

II. CONCLUSION

Biscuits are used worldwide for their health value and can be stored for a long time. The production of biscuits in India is a major food industry. Available in a variety of shapes, fillings, colors, and toppings, biscuits are popular with consumers of all ages.

ACKNOWLEDGEMENT

We would like to express our gratitude to Faculty of Pharmacy, Dr Babasaheb Ambedkar Technological University Lonere, Maharashtra, for offering the opportunity to conduct project work on a nutritive biscuit with herbal extract. We also want to express our gratitude to the faculty members who helped us along the way.

REFERENCES

[1]. Dhull, S. B., Punia, S., Sandhu, K. S., & Kaur, M. (2020). Evaluation of nutritive biscuit with herbal extracts (Trigonella foenum-graecum L.). Journal of Food Processing and Preservation, 44(2), e14330.

[2]. Devi, A., & Khatkar, B. S. (2018). Formulation of herbal biscuits using Aloe vera and ashwagandha and their quality evaluation. International Journal of Chemical Studies, 6(3), 2747-2751.

[3]. Srivastava, S., & Genitha, T. R. (2016). Functional biscuits for health promotion: A review. International Journal of Food and Nutritional Sciences, 5(3), 1-6.

[4]. Prasad, K. N., Yang, B., Dong, X., & Jiang, Y. (2009). Application of natural antioxidants from medicinal plants, herbs, and functional foods in meat and meat products. Meat Science, 83(1), 1-11. https://doi.org/10.1016/j.meatsci.2009.04.037

[5]. Kumar, N., & Sharma, S. (2020). Development and quality evaluation of nutraceutical biscuit from composite flour of wheat, oats, and medicinal herbs. Journal of Pharmacognosy and Phytochemistry, 9(5), 3034-3040.

[6]. Gupta, R., & Sehgal, S. (2015). Development and nutritional evaluation of cereal and legume based herbal biscuits. International Journal of Food and Nutritional Sciences, 4(3), 116-121.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 11, May 2025
Impact Factor: 7.67

[7]. Singh, G., Kawatra, A., & Sehgal, S. (2016). Development and nutritional evaluation of herbal biscuits using tulsi (Ocimum sanctum) and ashwagandha (Withania somnifera). International Journal of Food and Nutritional Sciences, 5(2), 50-55.
[8]. Ghosh, M. (2009). Functional foods and nutraceuticals in health promotion. Pharma Times, 41(2), 11-13.
[9]. Hingra, D., Michael, M., Rajput, H., & Patil, R. T. (2012). Dietary fiber in foods: A review. Journal of Food Science and Technology, 49(3), 255-266.
[10]. Kokate, C. K., Purohit, A. P., & Gokhale, S. B. (2015). Pharmacognosy.