



Formulation and Quality Assessment of Banana Date Fruit Chutney

A Thesis Report by

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Submitted to the Department of Nutrition and Food
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Nutrition and Food Engineering.

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LETTER OF TRANSMITTAL

Date: 09-10-2024

To

Dr. Nizam Uddin

Associate Professor & Head

Department of Nutrition and Food Engineering Faculty of Health & Life Science Daffodil

International University

Subject: Submission of project report. Dear Sir

I am here to submit my project report on the Formulation & Quality Assessment of Banana date fruit chutney mixed which is significant for the NFE program curriculum. Now, I would like to thank you so much for the direction, advice, and support you have given to this report and it is a significant achievement to work under your supportive supervision. I have had the opportunity to work on this project. It's difficult to complete this report without your supervision.

This project has given me both academic and practical exposure. I learned about the mixed chutney dietary guidelines and nutritional assessment. I shall be highly obliged if you are kind enough to receive this report and provide your valuable judgment.

Sincerely yours

Fareya Ahmed Trisha

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Department of Nutrition & Food Engineering

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CERTIFICATE OF APPROVAL

I am pleased to certify that **Fareya Ahmed Trisha's** project report, "Formulation & Quality Assessment of Banana Date Fruit Chutney" has been authorized for presentation & defense/viva-voice by the Department of Nutrition and Food Engineering.

I'm satisfied to certify that the data and the statements in this report are authentic work of Fareya Ahmed Trisha. I recommended the thesis report presented by Fareya Ahmed Trisha. Further academic recommendations and defense and viva-voice. She bears a less moral character and personality. It is a pleasure working with her and wishing her a successful life.

EXAMINING COMMITTEE

Chairman of the Board _____

External Member _____

Internal Member-1 _____

Internal Member-2 _____

Dr. Nizam Uddin
Head
Nutrition and Food Engineering
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DECLARATION

The undersigned certifies that this study was completed according to the supervision of Juwel Rana, Assistant Professor in the Department of NFE at Daffodil International University. Furthermore, according to the author, no degree or diploma has ever been awarded for this task, in whole or in part.

Supervised by:



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Submitted by:



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ABSTRACT

The date palm tree is the source of the date fruit. Globally, the plant is a popular houseplant. Imagine a date with a chewier texture and a caramel flavor profile. Dates, similar to mature bananas, increase in sweetness as they ripen due to their high sugar content. Dates are packed with nutrients. Consume dates in moderation for their health benefits. The banana and date fruit chutney was painstakingly formulated to improve the nutritional value, texture, and taste. It's a beautiful blend of tropical sweetness with deep caramel overtones. The chutney's microbiological, chemical, and physical properties were evaluated using quality evaluation criteria. The research set out to develop a condiment that would satisfy the increasing desire for unusual and exotic flavors while also providing possible health advantages from the use of nutrient-rich components.

Keywords: Date fruit, banana, and Health benefits

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CHAPTER 1 INTRODUCTION

The significance of vegetables in the human eating routine is all around perceived. Vegetables are ready-made heavenly food and are esteemed for their nutrients and mineral substance. Without this human body can't keep on being solid or protected from infection. Different kinds of confections incorporate caramels, chewy candies, hard confections, candy, and so on. Because of unnecessary sugar and engineered added substances, they are unfortunate. Handling date fruit chutney alongside removal is one method for giving an advantage. Date fruit are a high percentage of carbohydrates, as well as fiber, manganese, and potassium. The utilization of high fructose represses microbial decay by decreasing water movement and degree timeframe of realistic usability through unrivaled dampness control. Therefore, we legitimize that our item is helpful for our well-being useful.

Date fruit are that are grown in desert and tropical climates, and thus have a significant value in the Middle East and North Africa. Date trees reach up to 30 meters to 100 feet in height, growing singly or forming a clump with several stems from a single root system. Slow growing they can reach over 100 years of age when maintained properly. A date fruit tree gives fruiting in (4- 8 years) per tree gives 30-40 kg of date fruits. Its scientific name is *Phoenix dactylifera*. Dates are healthy fruits that contain many vitamins, fibers, and minerals, that support the liver and protect it from harmful toxins. Thus they maintain the vitality of the body.

There are more than 200 varieties of dates with different shapes and flavors, however, all of them are the same in nutrition. The ripest and tastiest new form of dates is blackened or brown in color, also known as black dates. Dry dates are dehydrated versions of the fruit used for many purposes. Dates are rich in fiber. So intake of 2-3 dates every morning in an empty stomach can cure you from constipation. Dates contain vitamins C and fiber, which increase iron absorption.

Eating dates may help improve brain function. Dates are a terrific night snack because they're rich in fibre. Fibre gives you a sense of fullness and helps to digest.

- ✓ Rich in protective antioxidants.
- ✓ Support gut health.
- ✓ May support bone health.
- ✓ Facilitate a natural birth.
- ✓ Maybe a useful sugar replacement.
- ✓ Lower cholesterol.

Objectives

- ✓ To prepare Banana, dates & tamarind chutney.
- ✓ To conduct proximate analysis of value-added banana, dates & tamarind chutney.

CHAPTER 2

REVIEW OF LITERATURE

Chutney and date relish were made on a laboratory scale using fruits from five significant date varieties cultivated in the UAE. The fruits were harvested at varying stages of maturity. Based on the sensory quality scores of the chutney and date relish made from these cultivars at the Khalil and kimchi stages of maturity during storage, the panelists were unable to discern any differences in sensory quality among the samples prepared from different cultivars. The samples of date relish and chutney showed a considerable rise in mold counts and overall plate counts although they remained below permissible limits even after storage. While left at room temperature for five months, these items were free of coliforms and Enterobacteriaceae. To learn more about how to make these processed date fruit items, particularly date relish, with added value, more product development studies are required (Al-Hooti et al., 1997)

One of the most common perennial fruit trees, the date palm (*Phoenix dactylifera* L.) is cultivated all across the globe, but especially in North Africa and West Asia. Worldwide, its fruit, the date, is a favorite. The tree's reputation as a valuable commercial fruit crop and its positive effects on health have made it famous across the globe. When it comes to macro- and micronutrients, dates are a great, inexpensive option. Carbohydrates, such as soluble sugars and dietary fiber, make up the bulk of date fruits, while small amounts of fat and protein round out the composition. Dates provide several health benefits, including preventing cancer, inflammation, hepatoprotection, gastrointestinal protection, anti-microbial, anti-mutagenic, and anti-cancerous. The fruits of the date palm are a valuable commodity, even if not all kinds have been commercialized. The discovery and measurement of diverse types of phytochemicals, along with a plethora of in vitro and animal research, have all been spurred by the current surge in interest in dates and their many health advantages. Many different foods may be manufactured from dates. Date paste, syrup, juice, sugar, jam, jelly, butter, chocolate, sauces, pickled dates, oils, coffee, and so on are just a few examples. Updated information on the makeup of several date types, the potential health benefits of *Phoenix dactylifera*, and processed goods manufactured from date fruit are all part of this review (Musthafa, M., & Sandhu, 2022).

Over 200 different types of dates exist, each with unique flavors and forms, yet they all have the same nutritional value. Known as black dates, these are the ripest and most delicious of the new dates, with a blackened or brown color. Dates that have been dried out and utilized for various purposes are called dry dates.

Dates are a high-fiber food. Therefore, eating two to three dates every morning on an empty stomach can help you avoid constipation. Dates are high in fiber and vitamin C, which improve the absorption of iron.

Health Benefits of dates-

- Support gut health.
- Rich in protective antioxidants.
- Lower cholesterol.
- Offset anemia.
- May be a useful sugar replacement.

Health benefits of Banana-

- Improve blood sugar level.
- Full of antioxidants.
- Bananas are good for our skin.
- Banana gives us energy.
- Rich in nutrients.

CHAPTER 3

MATERIALS&METHODS

3.1 Materials & Methodology

The research was carried out at the Daffodil International University's Nutrition & Food Engineering Department in Dhaka.

Collection of Raw Materials

The raw ripe banana, tamarind, dry dates, black cumin. The following components were used in the development of the banana dates chutney study.

3.2 Ingredients:

- ✓ Dates (1 cup) 250 gm
- ✓ Banana (2 pieces) medium size
- ✓ Tamarind pulp -- (2 tablespoons) 28 gm
- ✓ Red chili powder -- (1/2 teaspoon) 2.84 gm
- ✓ Black cumin -- (1 teaspoon) 4.2 gm
- ✓ Cumin powder -- (1/2 teaspoon) 2.84 gm
- ✓ Coriander powder -- (1/2 teaspoon) 2.84 gm
- ✓ Dry ginger powder -- (1 teaspoon) 4.2 gm
- ✓ Black salt -- (1/4 teaspoon) 1.42 gm
- ✓ Garam masala -- (1/4 teaspoon) 1.42 gm
- ✓ Water -- (2 cup) 500 gm
- ✓ Sodium benzoate (5 ml)

3.3 Methodology:

Making the date and mildly sour tamarind pulp. Remove the seeds from the date and chop it into small pieces. Cook them with 2 cups water in a pressure cooker for 2 whistles, or boil them in 2 cups water over low heat until tender, about 10 minutes. Allow it to cool before puréeing them in a blender or mixer with water. Puree should be transferred to a medium-sized pan and heated to a boil over medium heat. Add the ripe pulp of the tamarind (without seeds) and the boiled banana. Cut off the flame, then thoroughly stir in the black salt, ginger powder, garam masala, cumin powder, and red chili powder. Check it for seasonings and salt. If necessary, add extra salt or spices, then turn off the heat. Soak it in room temperature.



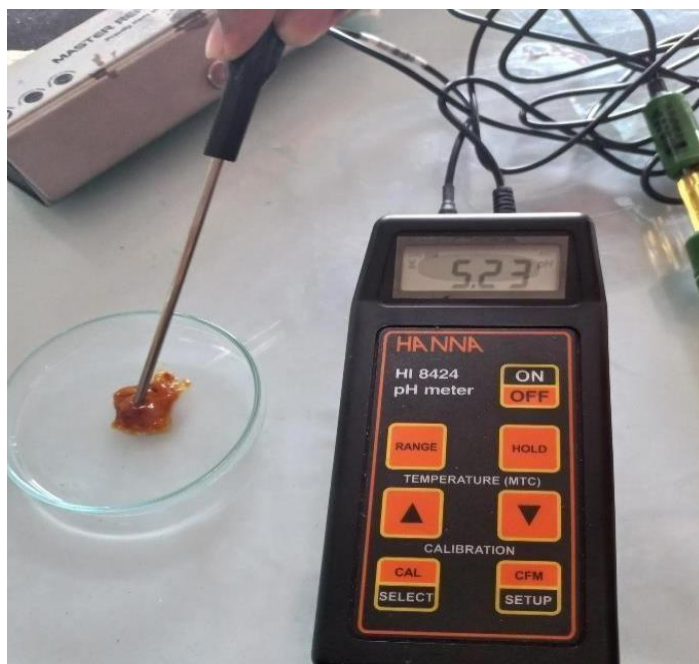
Figure: Preparation on banana date fruit chutney

CHAPTER 4

Chemical Analysis of Chutney

3.4 Chemical analysis of chutney: pH:

The pH value of any solution indicates whether it is acidic, neutral, or basic. It is also used to determine the strength of the acid and base. The banana chutney's pH value is 5.3 which means it's safe for our body and health program. Here is my pH test result.



3.5 Identification of Ash:

Banana date fruit chutney sample ash determination method following



Sample Preparation

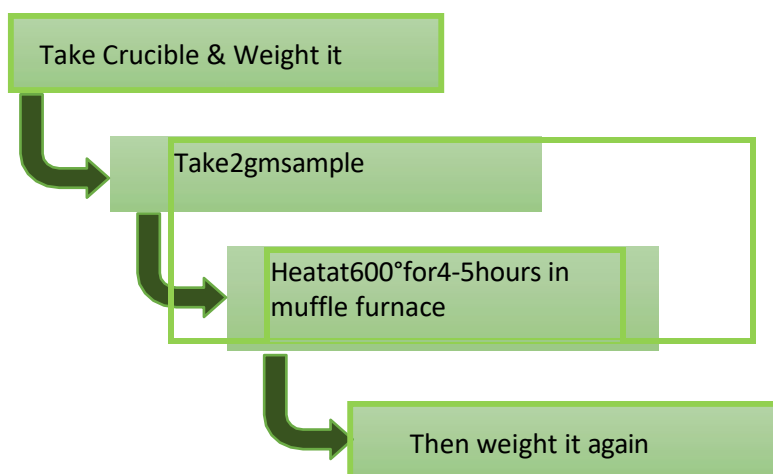


Figure 3.1: Ash Determination

Calculation of ash-weight of ash

$$\begin{aligned} \text{ash (\%)} &= \frac{\text{weight of ash}}{\text{weight of the dried sample}} \times 100 \\ &= \frac{0.0103}{0.0103} \times 100 \\ &= 1.330\% \end{aligned}$$

3.6 Determination of Brix°

Place a small quantity of sample (2-5 drops) on the prism, & secure the cover plate. Point the prism of the refractometer toward a light source & center the eyepiece until the scale is noticeable. After that count the brix.

3.7 Determination of Moisture

Banana, date, fruit, nut, sample moisture determination method following Sample Preparation

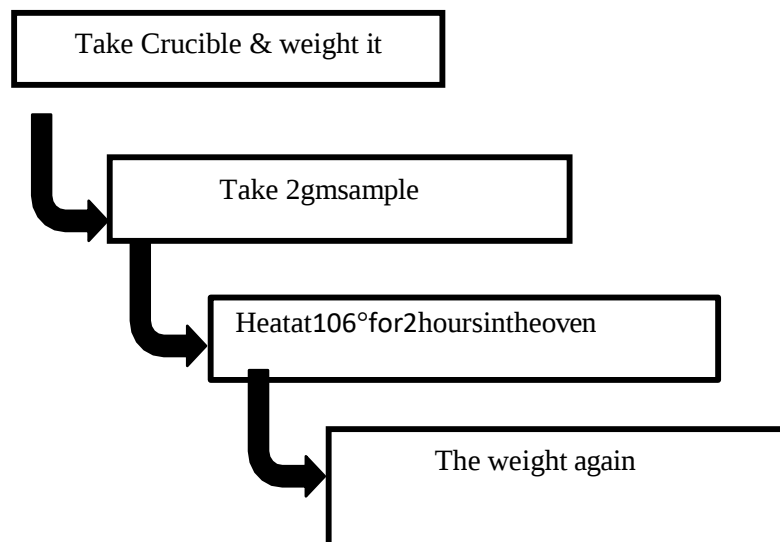


Figure 3.2: Moisture Determination

Calculation

Two grams (2 g) of the ground sample was placed in an oven at 106°C for 20 hours. On cooling, the sample was weighed again and the weight loss was recorded and the moisture content was calculated according to the equation.

$$\text{Moisture content(\%)} = \frac{(B - A) - (C - A)}{B - A} \times 100$$

$$B - A$$

$$\text{Dry matter (\%)} = 100 - \text{moisture content}$$

Where A = weight of clean dry crucible (g)

B = weight of crucible + wet sample (g)

C = weight of crucible + dry sample (g)

$$\text{Moisture content(\%)} = \frac{(B - A) - (C - A)}{B - A} \times 100$$

3.8 Microbiological Analysis (Total Viable Count)

The pour plate strategy is utilized to ascertain the number of microorganisms per milliliter or microbes per gram in a sample. I need to see if any micro organisms, mold, parasites, e-coli had filled in it and additives are working or not. Therefore, for inorganic tests, I use EMB agar for E-coli assurance, Nutrient agar for microbes, & SDA for parasites and mold. For dilution, I utilized NaCl and water mixture.

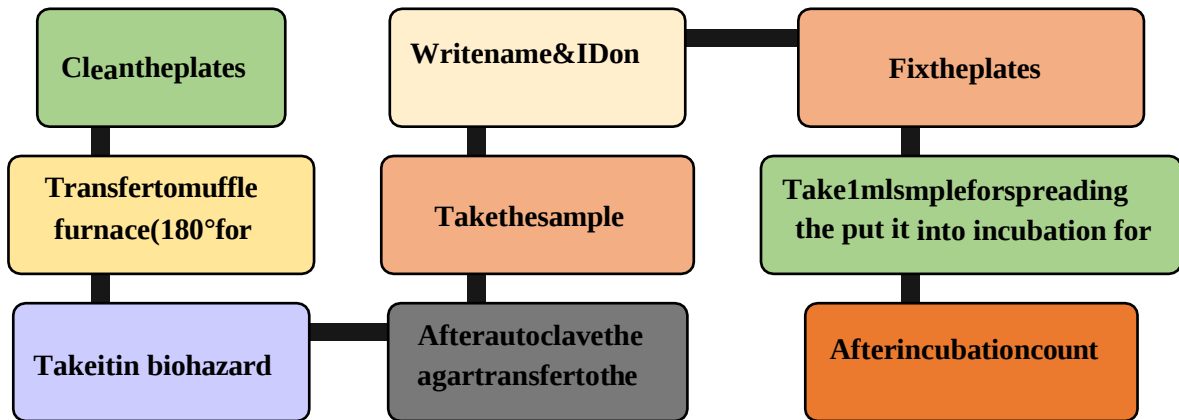
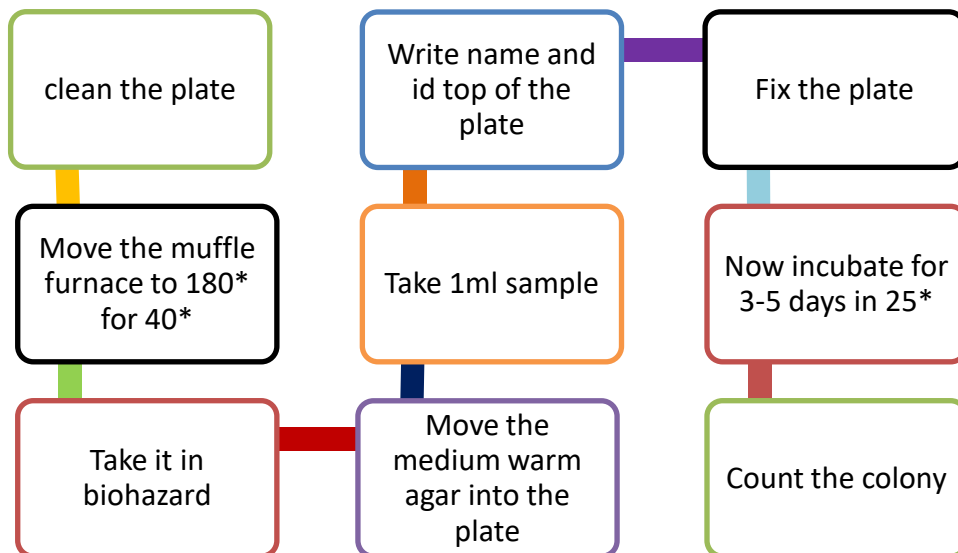


Figure 3.3: Determination of E-coli

Total Bacterial Count & Mold & Fungus (B)



4.1 Nutrition Value of Banana Date FruitChutney Nutritional value per 100g of banana date fruit Chutney:---

Principle Nutrient Value

Energy 134 KCal

Carbohydrates 25g

Protein 12.15 g

Cholesterol 6 mg

Total Fat 0.0017 g

Dietary Fiber 3.8 g

Folic Acid 4.7µg

Figure 4.1: Table- Nutritional value of Banana Date fruit chutney

4.2 Health Benefits of Banana Date Fruit Chutney

- Cardiovascular Health: Rich in nitrates, which offer sustained energy for improved cardiovascular health and improved workout efficiency.
- Anemia: Take iron supplements to prevent iron deficiency and to provide adequate oxygen delivery (reduce weakness). Low blood volume
- Cancer: Contains a substance called betalain, which protects cells from damage and prevents cancer.
- Skin: Six vitamins, which include a tiny quantity of C, B1, B2, and A, are necessary for healthy vision and to prevent night blindness. Additionally, it promotes the integrity of healthy skin cells.
- Immunity System: Tamarind's high fiber content and antioxidant content support our body's defenses against illness. protecting against infection and maintaining a robust immune system.
- Digestion: A high-fiber diet promotes a healthy digestive system in the stomach. lowers the likelihood of constipation, diarrhea, and irritable bowel syndrome (IBS)

CHAPTER 5

RESULT&DISCUSSION

4.1 Nutrition Value of Banana Date fruit chutney: Nutritional value per 100g of banana date fruit chutney -

Sample	Moisture	Protein	Ash	Carbohydrate	Fat	Calories
S1	1.58%	12.156%	1.3%	25%	0.1%	124.97Kcal



Figure 4.1: Table- Nutritional value of Banana Date fruit chutney

5.2:Table2- SensoryEvaluation

Name:Volunteers		Product:BananaDatefruitchutney			
Panelistno:50		Date:20/01/2023-23/01/2023			
Instruction: Tastethegivensample,thenmark the point in the scale that best describes your feelings.					
Score	Color &Appearance	Texture	Flavor	Taste	Overall acceptability
(9)LikeExtremely	25	32	30	36	32
(8)Likeverymuch	15	25	26	22	30
(7)Likemoderately	10	15	12	16	12
(6)Likeslightly	5	3	2	6	2
(5)Neitherlikenor dislike	0	0	0	0	0
(4)Dislikeslightly	0	0	0	0	0
(3)Dislike moderately	0	0	0	0	0
(2)Dislikevery much	0	0	0	0	0

CHAPTER 6 CONCLUSION

This chutney was made of well-being useful fixings, such as banana, date fruit, tamarind extricates, ginger powder, cumin powder, gram masala, black salt, and black cumin. These ingredients make it healthier, tasty, & even appetizing. This is similarly great for individuals of all age groups. Using date fruit chutney separately upgrades the property of the cancer prevention agent in the body. The utilization of high fructose corn syrup gave an extraordinary flavor to the item. It additionally diminishes water movement & forestalls decay. Accordingly, this chutney was likewise tried for the period of usability & it appears to have a period of usability of around 3 weeks put away in the fridge. The aftereffect of the review showed that date fruit chutney showed a positive outcome & was endorsed to be the most incredible in all sensory attributes by the panelists. This concentrate additionally uncovered date fruit chutney was higher in protein content & somewhat acidic. There was no microbial growth after 10-15 days. It has been entirely tried in the lab to see its health benefits & great outcomes have been found after the test. After the test in this chutney Brix 25.7, Ash content is 5.020%, and Protein content is 10.156%. Moisture content is 1.58%, Ph 5.23.

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