



A Project Report

On

Assessment of physicochemical and sensory quality of Muskmelon Cake

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Submitted To

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Date of Submission: 16.10.2022

LETTER OF TRANSMITTAL

Date: 16/10/2022

To

Dr. Nizam Uddin

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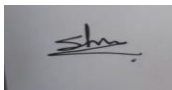
Faculty of Allied Health Sciences

Daffodil International University

Subject: Submission of project work report.

Dear Sir, with all due respect I would like to express my gratitude for your direction and support during my investigation. It would not be feasible for me to finish this report without your help. I'm additionally appreciative to Daffodil International University and my educators and numerous other individual people for their management, backing and help during my Project work. I have prepared this report based on the acquired taste knowledge during my Project Period. It is great achievement to work. Without your help, this report would have been impossible to complete. This report is based on, "Assessment of physicochemical and sensory quality of Muskmelon Cake". I have got the opportunity to work in your University on Product Development. This is the first times this project gave me both academic and practical exposures. Firstly of all I have gained knowledge about the organizational culture of a prominent on Assessment quality and muskmelon cake of our country. Secondly, the project gave me the opportunity to develop a network with the corporate environment. I therefore, would like to place this report to your judgment and suggestion. Your kind advice will encourage me to perform better planning in future.

Sincerely Yours,



Shakib Ahamed

ID: 191-34-869

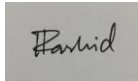
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CERTIFICATE OF APPROVAL

I am pleased to certify that the Project report on “Assessment of physicochemical and sensory quality of Muskmelon Cake” conducted by **Shakib Ahamed**, bearing respectively ID No: **191-34-869** of the department of Nutrition and Food Engineering has been approved for presentation and defense/viva-voice.

I am pleased to hereby certify that the data and finding presented in the report are the authentic work of **Shakib Ahamed**. I strongly recommended the report presented by further academic recommendations and defense/viva-voice. **Shakib Ahamed** bears a strong moral character and a very pleasant personality. It has indeed a great pleasure working with him. I wish him all success in life



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In preparing this report, I want to acknowledge the support and assistance provided to me by a number of people. From the start, I want to express my gratitude to Allah, the Almighty, for providing me with the strength and opportunity to complete the report on time. I would like to use this opportunity to express my gratitude to everyone who has been a part of my life at any point.

I'm grateful for my family, without whom I wouldn't be able to function. I wouldn't be able to achieve my goals and objectives without the assistance of my family.

I'm profoundly obligated to my authoritative Supervisor **Md. Harun-Ar Rashid** Lecturer (Senior Scale), Department of Nutrition and Food Engineering, Daffodil International University, for his extraordinary collaboration in my Project Work. It would have been undeniably challenging to set up this report up to this imprint without his direction.

On behalf of my Academic boss, the notable, I express my deep gratitude and earnestness. Head Department of Nutrition and Food Engineering, Faculty of Allied Health Science, Daffodil International University, associate professor, **Dr. Nizam Uddin** for this caring collaboration and to acknowledge this Degree. I'm support taking this honor to convey my appreciation to every single individual who are engaged with me in each period of my lives.

I'd want to express my heartfelt gratitude to NFE Faculty members for their never-ending enthusiasm and support during my time as a student.

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Abstract

Muskmelon has ribbed, netted, or smooth skin, as well as a sweet or bland flavor and a musky scent. Muskmelon is a good source of carotenes, apocarotenoids, ascorbic acid, flavonoids, terpenoids, chromone derivatives, carbohydrates, amino acids, fatty acids, phospholipids, glycolipids, volatile components, and other minerals. It has also been proven to have medicinal qualities such as analgesic, anti-inflammatory, antioxidant, free radical scavenging, anti-platelet, anti-ulcer, anti-cancer, antimicrobial, hepato protective, diuretic, and hepato protective. Tere for the aim of this study was to cake using muskmelon. It is found that the newly developed cake has very palatable sensory features. None of the participants disliked the cake, and 55% of participants said it was quite delicious. According to its physicochemical characteristics, it is a good source of health and will keep the user hydrated. The developed cake was also very similar to commercial cake of Bangladesh in terms of physicochemical properties. The pH ranged from 4.4 to 6.5; moisture level was around 65%, and brix level of 28. Muskmelon Cake had a little lower acidity than other cakes, around 0.1 percent. Muskmelon Cake has a far higher mineral content since the ash content was higher.

Chapter One

Introduction

1.1 Introduction

Phytonutrients can be found in abundance in melons. The orange, netted melons (cantaloupes) are high in ascorbic acid, as well as other vitamins and minerals. Because of their high water and sugar content, melons are very delicious to consume. Due to the global preference for melons, their cultivation might be a long-term assurance of beneficial agriculture. However, melons, particularly netted cantaloupes, have become a recurrent source of pathogens causing foodborne disease outbreaks, including Salmonella infection. Cantaloupes grow at ground level, increasing the risk of fruit contamination on the surface. Pathogens' ability to bind to the porous rind of the melon and internalize and form biofilms may encourage the incidence of melon-related foodborne disease outbreaks. Even if the contamination is limited to the rind, it can spread to the flesh during the cutting process.

According to the FDA food code, cut cantaloupe is a potentially dangerous product because of its mild acidity (pH 5.2), which can enable the growth of germs. Melons, particularly netted melons are frequently used as transporters for infections that cause foodborne illness outbreaks. Salmonella has been blamed for the majority of melons-related outbreaks, but Escherichia coli has also been blamed. The most prevalent scenario in melon-related epidemics is that the melon was contaminated on the farm, but that the contamination was exacerbated by bacteria being transferred to the flesh during cutting and subsequent temperature abuse. Several salmonellosis outbreaks have been linked to imported cantaloupes, and repeated incidences involving Mexican melons have resulted in the closure of the Mexican cantaloupe's borders in the United States. Musk Melon Cake is being made in Bangladesh as a special part of Musk Melon.

1.2 Literature Review

Musk melon (*Cucumis melon*) is a lovely, juicy, and delicious fruit belonging to the Cucurbitaceae family, which comprises 825 species in 118-119 genera. Cucumbers, watermelons, Muskmelons, squash, and pumpkins are all members of this family of edible gourds. Muskmelon is grown all over the world in tropical and subtropical climates for its nutritional and therapeutic benefits. In Hindi, the fruit is known as Kharbooja, and in English, it is known as Muskmelon or Cantaloupe. Carotenes, apocarotenoids, ascorbic acid, flavonoids, terpenoids, chromone derivatives, carbohydrates, amino acids, fatty acids, phospholipids, glycolipids, volatile components, and other minerals are among the phyto constituents found in various portions of the plant. *Cucumis melo* has been proven to have medicinal qualities such as analgesic, anti-inflammatory, antioxidant, free radical scavenging, anti-platelet, anti-ulcer, anti-cancer, antimicrobial, hepato protective, diuretic, and hepato protective.

1.2.1 History of Muskmelon

The muskmelon is said to have been brought to Bermuda in 1609 and to California by the Spaniards in 1683. Before 1650, it was grown in Brazil. The main varieties, as well as their varied sizes, shapes, and colors, were known in the 16th century. The fruit is said to be

indigenous to India and Africa. India is one of the world's leading producers of muskmelon. Tamil Nadu, Telangana, and Karnataka are the primary muskmelon producing states in India. According to Paris, the true ancestor of the contemporary watermelon is *Citrullus landaus* var. *colocynths*, also known as *gurum* in Sudan and *gurma* in Egypt.

1.2.2 Types & Varieties

*Madhu hara Madhu is a well-known type that can reach a height of 3-5 meters.

*Madhu Durgapura. It is one of the first muskmelon cultivars.

*Rajhans Arka

*Arka Jeet.

*Sharbati Pusa

*Pusa Rasraj

1.2.3 The Nutrition Fact of Muskmelon

Cantaloupe melons provide 34 calories per 100 gram serving and are high in vitamin A (68 percent DV) and vitamin C (61 percent DV), with other nutrients being insignificant. Melons contain 90% water and 9% carbs, with protein and fat content of less than 1% each. Except for vitamin D and E, muskmelon contains practically all fat and water-soluble vitamins.

Ascorbic acid content is greater than 40 mg/100 g of fresh weight. Muskmelon also contains vitamin B1, B3, and B6, making it a unique fruit when compared to Folate, often known as vitamin B9, is abundant in muskmelon and other melon fruits. It is a very important vitamin that is required for optimal health, and a larger dose is required during pregnancy and to prevent macular degeneration. Muskmelon also includes vitamin K, which is necessary for blood clotting, making the fruit beneficial in the prevention of cardiovascular disease. Despite the fact that muskmelon does not contain vitamin A, Muskmelon is low in calories and high in fiber, thus it can be included in a daily diet to help with weight loss. It is also good for your eyes because it contains a lot of vitamin A. Muskmelon is high in antioxidants, which are good for the skin. It is beneficial to your blood pressure. Muskmelon is high in potassium, which helps to keep your blood pressure in check. Aids in digestion. Aids in the hydration of the body. Improves the health of the skin. It has a wide range of nutrients. If you have a sensitive stomach, stay away from Muskmelon because it can produce flatulence. Muskmelon eaten in excess might cause stomach issues. In nature, muskmelon is Sita, or chilly. As a result, eating Muskmelon when suffering from a cough or cold is not advised. The explanation for this is the fruit's low glycemic load of only 3.14. This is because a cup of diced muskmelon (150 grams) contains around 5.7 grams of carbohydrates, allowing for a gradual increase in blood glucose levels. Its high potassium concentration also aids in blood pressure control.

Nutrition Facts (Amount Per 100gm)

Calories 34

Sl. No	Nutrients	Amounts
01	Total Fat	0.2 g
02	Saturated fat	0.1 g
03	Cholesterol	0 mg
04	Sodium	16 mg
05	Potassium	267 mg
06	Total Carbohydrate	8 g
07	Dietary fiber	0.9 g
08	Protein	0.8 g

1.2.4 The Health benefits of muskmelon

Maintains bodily hydration. Muskmelon has a lot of water, which helps to keep your body hydrated during the hot summer months. Booster of immunity. It is beneficial to the eyes. It is beneficial to the cardiovascular system. For a healthy gastrointestinal system. Weight loss assistance. Diabetic nephropathy can be avoided. Relieve tension. Muskmelons are good for weight loss because they have a low fat content. 5. It can aid in the management of diabetes: Muskmelons aid in the management of diabetes by regulating blood sugar levels. Keep your diabetes under control by include muskmelon in your daily diet.

Muskmelons are high in nutrients and contain a wide range of vitamins and minerals. They're abundant in vitamin C, a water-soluble vitamin that aids with disease prevention and immune function. Before 7 p.m., muskmelon should be consumed. Because muskmelon is slightly acidic, eating it late at night may make digestion more difficult. A cup of muskmelon contains less than 13 grams of natural sugar. If you have diabetes, it is recommended that you take muskmelon in moderation. Muskmelon has a glycemic load of 3.14 and a glycemic index of roughly 65. As a result, 150 grams of diced muskmelon has 5.6 grams of carbohydrates.

Watermelon, muskmelon, and honeydew are all good sources of vitamin B and C, as well as beta-carotene, potassium, and lycopene. Any of these melons, cut in half, can provide you with all of the vitamins you require. If you're trying to lose weight, muskmelon is a must-have. The fruit has high water content and is high in fiber, with no fat, cholesterol, sugar, or calories. The muskmelon, a favorite summer fruit, is what we're talking about. Many people enjoy it because of its juiciness and sweetness, but it also has some surprising health benefits that can aid with kidney problems and menstrual cramps. Muskmelon, cantaloupe, or kharja is not only a delicious summer snack, but it's also a terrific fruit for keeping your skin supple and

radiant. The fruit is full with minerals including vitamin A, B, and C, which help the skin stay healthy, young, and supple in addition to keeping it moisturized. Muskmelon has a cooling effect and aids with constipation relief. It can also help with bladder infections, ulcers, tiredness, colitis, and high blood pressure. It may aid weight loss due to its low calorie content and high fiber content. Muskmelon's nature is Guru, or hefty. If you have a sensitive stomach, stay away from Muskmelon because it can produce flatulence. Muskmelon eaten in excess might cause stomach issues. In nature, muskmelon is Site, or chilly. Water is abundant in muskmelon juice. It keeps the body hydrated and aids in the removal of harmful chemicals. It protects the liver by limiting fat deposition and prevents plaque build-up inside the arteries (atherosclerosis) (liver statuses).

1.2.5 Objective of the Study

Since muskmelon has lots of nutritional and health benefit therefor the aim of this study was-

- To develop commercial cake from muskmelon
- To determine the physicochemical properties of muskmelon cake.
- To analyze the sensorial quality of muskmelon cake.

Chapter Two
Materials
&
Methods

2.0 Materials and Methods

Ingredients

Flour, Baking powder, Powdered sugar, Salt, Vanilla essence. Muskmelon puree, Egg, Butter, deionized water and ultra-pure water was used throughout this study.

Equipment's

Mixer, Rubber Spatulas, Cylinder, Autoclave, , Offset Spatulas, pH Meter, Spectrophotometer, Cake Pans. Pipette, Burets, Petri Dish, Cake Decorating Tips. Pastry Bags. Conical Flask, Glass Tube, Electronic Balance, Moisture machine, Beaker, Thermometer, and Saucepan. Measuring Spoons and Measuring Cups. Mixing Bowls.

- **Raw materials**
- 3/4Cup Sorghum
- 1/4Cup Wheat Flour
- 3/4Cup Palm Candy Sugar Powder
- 1/4Cup Musk Melon
- 1/4Cup Grated Musk Melon
- 1/2Tsp Baking Powder
- 1/4Tsp Baking Soda
- 3Tbsp Coconut Oil
- 2Tbsp Thick Vegan Curd
- 1Tsp Vanilla Extract

2.2 Production Procedure of Musk Melon Cake

Sample One

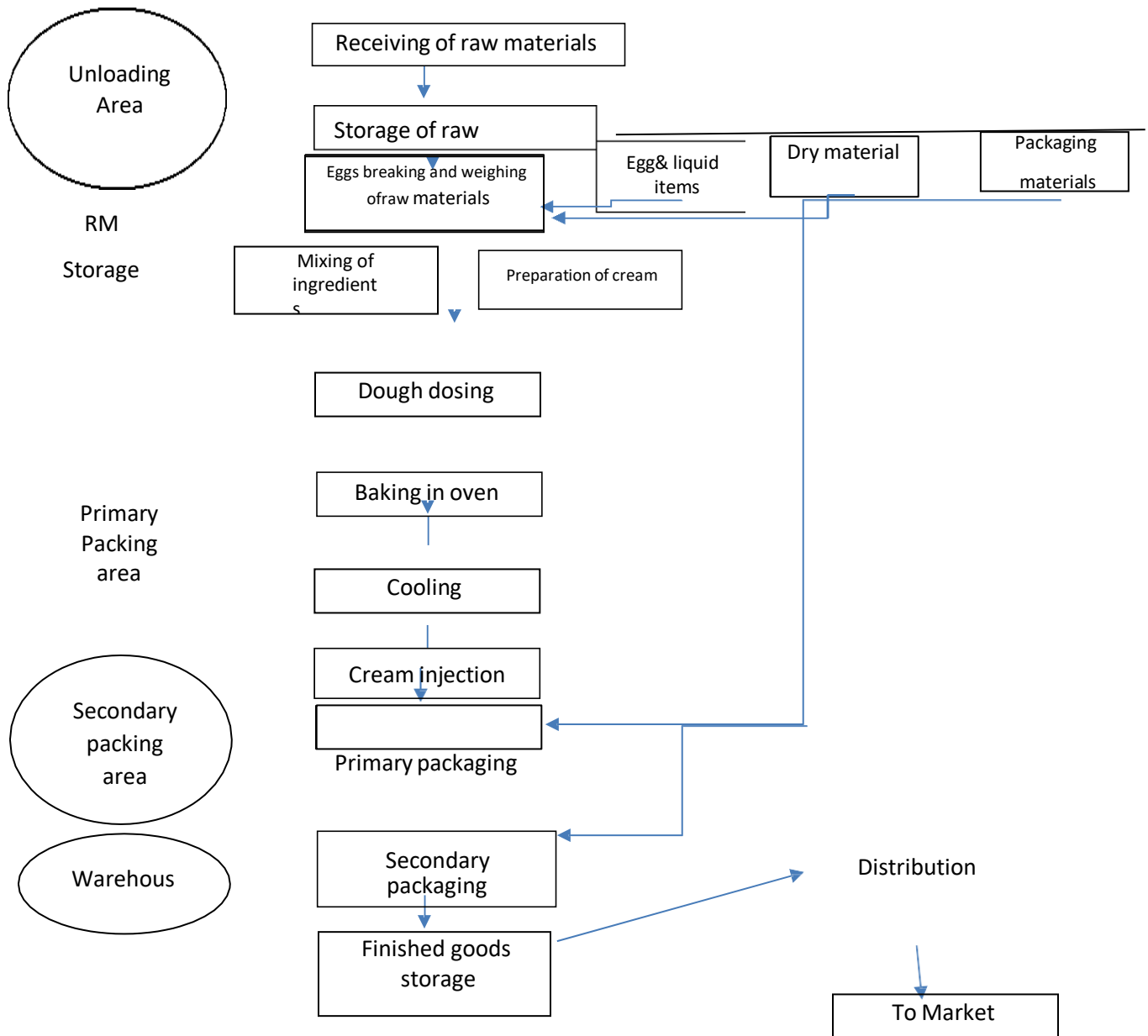
1. To get rid of the raw scent, lightly toast the jowar flour.
2. Combine the wheat flour, baking soda, and baking powder in a mixing bowl. Sieve three times.
3. Squeeze the juice from a muskmelon that has been grated.
4. In a large mixing bowl, combine the wet ingredients: coconut milk, curd, melon juice, oil, vanilla extract, and grated melon. Combine the palm candy sugar powder with the rest of the ingredients and stir well.
5. Mix the dry ingredients in two batches to avoid lumps.
6. Transfer to a greased and dusted cake mold and tap to remove the bubbles.
7. Preheat the oven to 180 degrees and bake for 40 minutes.

Sample Two

Take a quarter of the muskmelon and purée it without adding any water. Set aside. Combine the flour and baking powder in a sieve. Set-aside for now. Powdered sugar should be sieved and set aside. Cream together the butter and sugar until light and creamy. In a large mixing bowl, combine the vanilla extract, muskmelon puree, and salt. Add the eggs one at a time, beating thoroughly after each addition until they are fluffy. Preheat the oven to 180 degrees Celsius (350 degrees Fahrenheit.) Gently whisk in the flour, a bit at a time. Don't go overboard with the beats.

Pour the batter into the greased baking tray. Preheat the oven to 180°C and bake for around 10 minutes. Remove the dish from the oven and set it aside to cool.

Flow Diagram of Manufacturing Process:



2.3 Analysis of Physicochemical Properties

2.3.1 Determination of Ash

The AOAC (2005) technique was used to determine the ash content. About 5-10g of the sample is precisely weighed into a porcelain crucible, which is heated to 600°C and then cooled. The entire technique is outlined here.

- Firstly Place the crucible in the oven once it has been cleaned.
- Then cook for 20 minutes at 105°C in a dry Crucible.
- Cool in the crucible in the desiccator now.
- Take note of the blank crucible's weight.
- Keep track of the sample weight..
- Then Set the temperature to 700 degrees Celsius and the timer to 2 hours.
- Place the Crucible containing the sample inside the muffle furnace with care.
- Remove the muffle furnace and let it cool in the desiccator once more.

Take the ultimate weight, which includes Ash. Then there's the ultimate calculation.

2.3.2 Determination of Brix

A hand refractometer with a detection limit range of 0-32 Brix° was used to determine the TSS of the samples. A few drops of material were put on the prism surface with the daylight plate partly closed. The refractometer was held in the direction of natural light when the reading was taken. The entire technique is outlined here.

Zeroing hand refractometer

- To the view plate, add a few drops of distilled water..
- Allow the water to spread by closing the lid.. 3.Examine the refractometer by holding it upto the light..
- If necessary, adjust the eyepiece's focus.
- The knob or screw can be used to adjust the zero setting.

Main analysis

- Wipe the prism and open the daylight plate.
- Suck some drink up with an eyedropper.
- Using an eyedropper, suck some drink up.
- Focus the viewer by looking through it.
- Take note of where the viewer's line falls.
- Learn how to calculate Brix values for a variety of plants.

2.3.3 Determination of pH

Learn how to calculate Brix values for a variety of plants.

- First, I measure out a certain number of drinks into a clean beaker.
- Activate the pH meter.
- After 15 minutes, I inserted the digital pH meter into the beaker.
- After that, I took pH meter readings and wrote notes.

2.3.4 Determination of Acidity

A Methyl orange indicator is applied to a fresh portion of the sample. At a pH of 8.3, the sample is titrated with a sodium hydroxide solution until the indicator changes color endpoint). This titration is used to determine the total acidity, which includes both strong and weak acid species. The entire technique is outlined here.

1. Using a pipette, transfer 10 mL of milk to a 100 mL beaker to be tested.
2. As an indication, add 2–3 drops of Methyl Orange solution.
3. Make sure the amount of 0.1 N NaOH in the burette is at "0" before titrating the sample.
4. Slowly add 0.1 N NaOH from the burette, drop by drop, while shaking the sample in the beaker constantly. When was the first time you?

2.3 5 Determination of Moisture

A soil sample's moisture content is defined as the mass of water in the sample represented as a percentage of the dry mass after heating at 105°C, i.e.

$$\text{Moisture content, } w = \text{MW/MD} \times 100 (\%)$$

Where, MW = mass of water
MD = dry mass of sample

Details procedure as below

- Weigh and place a tiny sample of Drink (3 grams) in a moisture dish.
- The sample is cooked in an air oven for 1 hour at 105°C.
- Allow the sample to cool to room temperature before weighing the residue.
- 4. The moisture content of a drink sample is measured by heating it in an air oven and comparing its weight before and after heating.
- The moisture content determines the quantity of weight loss.
- The findings of the moisture content test are presented as a percentage.

Calculations:

Using oven drying processes, you may calculate the moisture and total solids content of meals.:

$$\% \text{Moisture (wt/wt)} = \text{wt H}_2\text{O in sample} \times 100 / \text{wt of wet sample} \text{-----} [2]$$

$$\% \text{Moisture (wt/wt)} = \text{wt of wet sample} - \text{wt of dry sample} \times 100 / \text{wt of wet sample} \quad [3]$$

$$\% \text{Total solids (wt/wt)} = \text{wt of dry sample} \times 100 / \text{wt of wet sample} \text{-----} [4]$$

2.4 Sensory Quality Analysis

The drinks' sensory quality was assessed in terms of taste, flavor, and texture. The acceptability was determined using the hedonic scale technique (1 to 9 scales), where 9 indicates strongly like and 1 means severely dislike.

Chapter Three

Results

&

Discussion

3. Results and Discussion
3.1 Physicochemical Properties

Table 1 shows the proximate composition of Muskmelon Cake. The pH ranged from 4.4 to 6.5, which is consistent with commercially available cake in Bangladesh. Moisture level was around 65%, which was quite high compared to other cakes on the Bangladeshi market. Brix level of 28 was higher than any other cake on the Bangladeshi market. Muskmelon Cake had a little lower acidity than other cakes, around 0.1 percent. This is because cake is less acidic than other fruits like mango and orange. Because the ash concentration was 0.24 percent, the Muskmelon Cake has a far higher mineral richness.

Table-1: Physicochemical properties of Muskmelon Cake.

Test Name	pH	Moisture	Degree Brix	Acidity	Ash
Sample-1	4.4	65.43%	28°	0.09%	
Sample-2	4.3	64.95%	28°	0.09%	
Sample-3	6.5	55.80%	28°	0.14%	0.24%

3.2 Sensory Quality of Muskmelon Cake

The sensory quality of Muskmelon Cake were performed on a group of 30 people. Table 2 shows the results of the participant's responses. In a survey of 30 participants, 53.3 percent extremely liked the appearance. 33.3 percent extremely liked the flavor and 13.3 percent extremely liked the taste. The Muskmelon Cake was not disliked by any of the participants.

Table-2: Sensory Quality of Muskmelon Cake

Score	Appearance	Flavor	Taste
Like extremely	53.33%	33.33%	13.33%
Like very much	40%	33%	27%
Like moderately	6.66%	33.33%	26.66%
Like slightly	0%	0%	0%
Neither like or dislike	0%	0%	0%
Dislike slightly	0%	0%	0%
Dislike moderately	0%	0%	0%
Dislike Very much	0%	0%	0%
Dislike Extremely	0%	0%	0%

Chapter Four

Conclusion

4. Conclusion

It is evident that the study's creation of a refreshing cake has very palatable sensory features. None of the participants disliked the cake, and 55% of participants said it was quite delicious. According to its physicochemical characteristics, it is a good source of health and will keep the user hydrated. The developed cake was also very similar to commercial cake of Bangladesh in terms of physicochemical properties. The pH ranged from 4.4 to 6.5; moisture level was around 65%, and brix level of 28. Muskmelon Cake had a little lower acidity than other cakes, around 0.1 percent. Muskmelon Cake has a far higher mineral content since the ash content was higher.

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