Thesis Report

On

PROXIMATE, SENSORY AND MICROBIAL ANALYSIS OF CAKE DEVELOPED WITH RAW FLAVOR OF MANGO (*MANGIFERA INDICA)*

BY

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APPROVAL

I am pleased to certify that the project Report "Proximate, Sensory and Microbial analysis of cake developed with raw flavor of Mangifera Indica (Mango)" conducted by **Md. Ibrahim Talukder** bearing **ID: 193-34-999** student of the Department of Nutrition and Food Engineering has been accepted for presentation and defense/viva- voice.

I am also happy to certify that the result and findings showed in the study are genuine work of Md. Ibrahim Talukder. He has a strong moral character and a charming demeanor. And wish him all the best in life.

EXAMINING COMMITTEE

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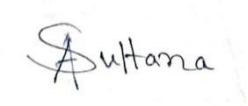
DECLARATION

In a humble confession, I sincerely declare that the “Proximate, Sensory and Microbial analysis of cake developed with raw flavor of ***Mangifera Indica*** **(Mango)**". Nothing that I have written is a rewrite of a prior thesis report or the work of any other student. In addition, I certify that the aforementioned thesis report has never been utilized to fulfill course requirements and will never be given to another individual or authority in the future. I do this by expressing my lawful authority.

Supervised by:



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ABSTRACT

Bakery goods consumption is significantly higher in portion in the worldwide food sector. Cake is a popular item on bakery menu and it is liked by all ages. In this study, raw Mango juice was included as cake ingredients.

The demand for consumers for natural and unusual tests has led to a substantial increase in the use of raw flavors in food goods in recent years. The study examines the proximate consumptions, sensory characteristics and microbiological integrity of raw mango flavor added to cake formulation. Different quantities of raw mango juice were used in a series of trials to create a cake with a mango flavor. The mango flavored cakes, moisture, protein, fat ash and carbohydrate contents were ascertained using proximate analysis and their test, aroma, texture and general acceptability were evaluated through sensory evaluation. To assess the microbial burden of the cakes. Microbiological analysis was also carried out.

In conclusion, the incorporation of raw mango in cake making presents an exciting opportunity for culinary experimentation, offering a delightful fusion of flavors that tantalize the taste buds. Further exploration into the use of raw mango in baking could unveil a myriad of possibilities for creating innovative and unforgettable desserts, catering to diverse culinary preferences and expanding the boundaries of traditional cake making.

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CHAPTER 1

1.1 Introduction

Mangifera Indica (Mango): *Mangifera Indica* (MI) known as the mango tree, represents tropical plenty and culinary delight. The mango originated in South Asia, specifically in the lush environments of India, Bangladesh, and Myanmar, and has spread across continents to become one of the world's most popular fruits. Beyond the sweet, luscious fruit, there is a rich tapestry of cultural relevance, botanical fascination, and agricultural importance. These blossoms produce luscious mango fruits that vary in shape, size, and color, with each variety possessing its own distinct blend of flavors and smells. Ripe mangoes are energizing and refreshing

Mango cultivation is more than just horticulture; it is a cultural tradition passed down from generation to generation. The mango is revered in both crowded markets and quiet orchards as a sign of fertility, prosperity, and indulgence. Its succulent flesh adorns the tables of feasts and festivities, while its essence infuses traditional recipes with an unsurpassed level of flavor. Aside from its cultural appeal, the mango has a wealth of nutritional and health benefits. This tropical jewel, packed with vitamins, antioxidants, and fiber, not only tantalizes the taste buds but also feeds the body and soul. The mango juice treats heat stroke and is a restorative tonic.

In this excursion, we will dig into the multifaceted world of Mangifera indica, learning about its production, celebrating its cultural significance, and tasting the irresistible attraction of its exquisite fruit. Join us on a journey through orchards rich in golden gems to discover the soul of the mango tree, a timeless emblem of abundance and happiness.

Mangoes are extremely nutritious, including high levels of vitamins, antioxidants, and fiber. Aside from its nutritional benefits, mangoes are a versatile ingredient in a variety of cuisines, including salads and desserts. Culturally significant, they represent plenty and prosperity, enriching gastronomic experiences and agricultural landscapes around the world.

Classification of *Mangifera Indica*:

Kingdom:	Plantae
Family:	Anacardiaceae
Species:	Indica
Genus:	Mangifera

Figure 1: *Mangifera Indica*

1.2 Objectives of My Study

The purpose is to investigate all the incorporation of the raw flavor of Mangifera indica also known as mango, into cake manufacture. This study intends to dive into several areas of this culinary endeavor, including flavor enhancement, customer acceptance, nutritional impact, texture modulation, and shelf-life assessment.

The study aims to find the ideal quantity and manner of adding mango flavor to establish a harmonious balance with other cake ingredients through thorough trial and analysis. It also aims to assess customer preferences and acceptance via sensory evaluation and market research, offering information on the potential market demand and economic viability of mango-flavored cakes.

Furthermore, nutritional analysis will reveal any changes in the macronutrient, micronutrient, and calorie content of the cakes following the addition of mango flavor. Texture studies will look at how they affect crumb structure, moisture retention, and overall mouthfeel, whilst shelf life tests will look at microbiological deterioration and storage stability over time. Furthermore, the study will look into cultural importance, sustainability issues in ingredient procurement, and the development of standardized recipes to assure consistency and quality. By addressing these characteristics completely, the study hopes to provide useful insights into the feasibility and desirability of mango-flavored cakes in the culinary landscape.

Some notable observations were:

1. Evaluate the proximal parameters of various cake formulations.
2. Evaluation of sensory quality for various cake formulations.
3. Observe microorganism activity in different cake compositions.

CHAPTER 2

2. Literature Review

2.1 Health benefits in Mango

People referred mangoes as **King of Fruits** because of its delicious flavor. Mangoes are beneficial because of their high vitamin content. These fruits are indigenous to southeast Asia and have been farmed there for generations. They are members of the family Drupes. Mangoes are packed in nutrients, having twenty different vitamins and minerals in just one fruit. They come in a range of hues and variations. Mangoes have been shown to boost digestion, boost immunity, reduces the chance of certain cancers, reduces the chance of cardiovascular disease and improve vision. Their high antioxidant content is the cause of all of these.

Protect Against Some Diseases: The fruit's peel, pulp, and seed kernel all contain a significant amount of polyphenols. Due to their antioxidant properties, these plant-based substances protect cells from DNA damage, which can result in degenerative illnesses including type 2 diabetes and cancer.

Support Heart Health: Eating mangos can benefit your heart by regulating the quantity of lipids (such as cholesterol) in the bloodstream. Mangoes contain mangiferin, a polyphenol found in plants and herbal treatments. Mangiferin reduces inflammation and cholesterol levels, which has been related to a reduced risk of heart attack and stroke.

Boost the Immune System: Carotenoids that a type of chemical that gives yellow fruits their color, are prevalent in mangoes. Taking foods high in carotenoids has various benefits, one of which is that they are essential for maintaining healthy immune system function. Additionally, the compounds have antioxidant properties.

Improve Skin Health: Vitamin C content in mangos is considerable. Collagen, the kind of tissue that gives skin its flexibility and helps prevent wrinkles and drooping, is produced by the body using this nutrient.

Ease Constipation: Mangoes have the potential to improve digestion. One study discovered that those who consumed 300 mg of mango every day for four weeks experienced less constipation.

Support Eye Health: In addition to vitamin C, mangos contain beta-carotene, another antioxidant that promotes eye health. Mangoes include carotenoids called lutein and zeaxanthin, which are antioxidants that benefit your eyes in a number of ways.

2.2 Health benefits of raw mango

There is no shortage of mango enthusiasts on the planet due to the tropical fruit's unparalleled taste and health advantages. It contains a variety of minerals, including vitamins A, C, K, folate, magnesium, choline, and potassium. Raw mango is a rich source of different nutritious components. They include a range of components, including vitamins, minerals, dietary fiber, and carotenoids. Some of the potential benefits of raw mango are listed below:

For weight management: Raw mango is high in fiber, low in calories, and can aid with weight management. It was discovered that male adults who consumed raw mangoes had a lower BMI, waist circumference, and body weight than non-consumers.

Aids for cancer: Raw mango contains antioxidants like polyphenols and mangiferin. Mangiferin inhibits cell growth and apoptosis. It is known to disrupt cell cycle regulation and therefore the carcinogenic route.

Aids for liver disorders: Raw mangoes may help prevent liver disorders by increasing bile production. Bile is a juice produced by the liver that aids in fat breakdown and digestion. It facilitates the elimination of medicines and poisons from the body.

Aids for cardiac disease: Raw mangoes contain mangiferin, a unique antioxidant that helps regulate triglycerides, cholesterol, and fatty acids. Mangoes also include fiber, potassium, and vitamins, which may help lessen the risk of cardiac disease.

Table 1: Nutritional composition of Mango (165g):

Contents	Parameters
Water	137.7 g
Carbohydrates	24.72 g
Dietary fiber	2.64 g
Total fat	0.627 g
Saturated Fat	0.152 g
Sugars	22.54 g
Protein	1.35 g
Vitamin C	60.1 mg
Potassium	277 mg
Sodium	1.66 mg
Cholesterol	0.0 mg
Fe	0.25 mg
Mg	16.5 mg
Zinc	0.15 mg

CHAPTER 3

3. Materials and Methods

The research project was carried out at Daffodils International University's Faculty of Nutrition and Food Engineering Laboratory in Dhaka, Bangladesh. The basic goods, mango, grain flour, and other materials were obtained from the Dhaka market nearby.

- ✓ Baking Oven
- ✓ Dough Mixer
- ✓ Weighing machine
- ✓ Sifted cake flour
- ✓ Baking powder
- ✓ Salt, White sugar
- ✓ Softened butter
- ✓ Eggs, Milk
- ✓ Grated Mango zest
- ✓ Mango fresh juice

3.1 Processing of Raw Mango Juice

Making green mango juice at home is a pleasant experience that brings the tropical flavor of ripe mangoes to your fingertips. The method is simple and we can have a pleasant beverage with little effort.
Follow these procedures to make delicious green mango juice.

Selections: Start with 2-3 firm, unripe green mangoes. The key is to choose mangoes that feel somewhat hard when touched indicating that they are unripe. This adds a tangy and sour flavor to the juice creating the ideal balance of sweetness and acidity.

Preparation: Wash the mangoes well to eliminate dirt and residues. Peel the skin using a knife or peeler to reveal the brilliant green flesh beneath. Once peeled, carefully separate the mango flesh from the seed. Cut the mango into tiny, manageable pieces.

Blending: Place the diced mango into a blender. Begin with a small quantity; you may always adjust it later. Pour in a cup of water to help with the blending process. The water helps to make a smooth puree.

Blending Process: Use a blender to get a smooth, vivid purée. The goal is to achieve a consistency that is neither too thick nor too thin while capturing the essence of the green mango taste.

Optional: To achieve a smoother texture, strain the puree. To separate any fibrous components, use a fine mesh strainer or cheesecloth, resulting in silky and refined mango juice. This step is optional and can be skipped if you prefer the extra texture in your drink.

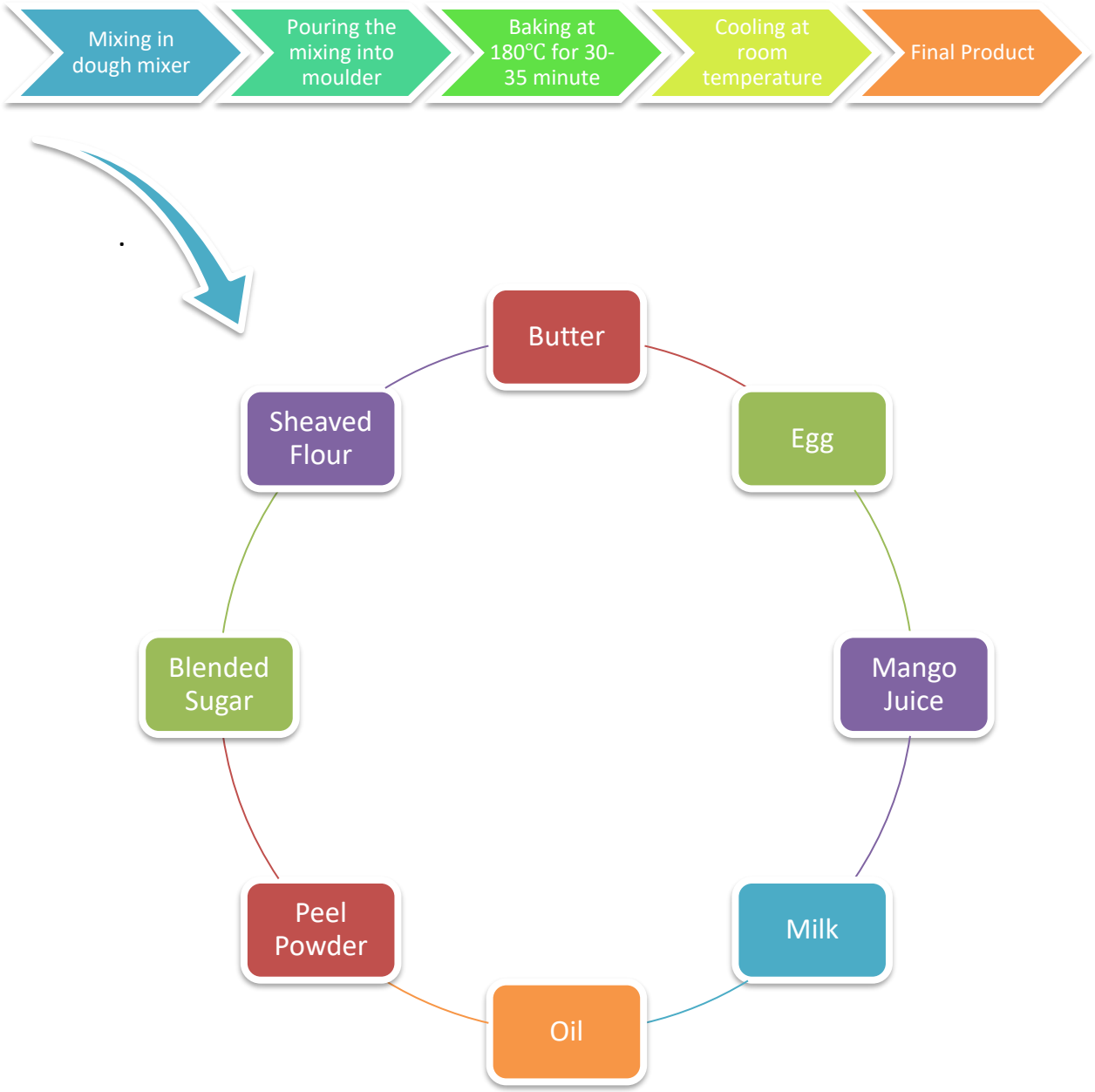
Consistency Adjustment: Check the consistency of the puree and modify it to your liking. If the juice is too thick, add more water and combine until the required consistency is reached. This stage allows us to customize the juice to our liking such as a thicker smoothie-like consistency or a lighter, more fluid beverage.

Figure 2: Mango Juice Processing

3.2 Cake Making Process

The raw components for the cake were weighed according to the recipe directions. First, mix the sugar and egg together until smooth and fluffy. Then add mango juice and beat. Mix together all of the dry components, then add 2.5 mg of peel powder to improve the texture and test of the result. Gently pour the ingredients into a baking pan and bake at 180℃ for 30 minutes. Remove from the oven and allow to cool.

3.3 Cake Making Flowchart



CHAPTER 4

4. Result and Discussion

4.1 Proximate Analysis

The AOAC technique was used to determine the moisture content. To put it briefly, 2g of juice sample was put in an aluminum dish and baked at 105oC for the entire night, or until a constant weight was reached. Equations were used to compute the moisture content.

Procedure:

- ✓ Insert an empty moisture dish into the analyzer after removing the cover.
- ✓ Turn off the switch.
- ✓ The analyzer displays 0.000 with the temperature and etching time.
- ✓ Use the choose button to modify the temperature.
- ✓ Accurately weigh a sample of two grams in a dish. Make an effort to divide the mixture equally.
- ✓ Press the start key and lock the cover closed.
- ✓ An analyzer calculates moisture content automatically and displays it as a percentage.
- ✓ After three beeps, the determination analyzer will stop down automatically.
- ✓ Make a note of the result.
- ✓ Turn off the switch.

Figure 3: Moisture Analyzer

4.2 Determining Ash Content:

The ash content was established by applying the AOAC (2005) methodology. The mineral deposit (minerals) left over after fire and complete oxidation of organic substances is represented by the content of ash. A sample is heated to 500–600°F in a muffle oven for the purpose of dry ashing. Because oxidizing agents, acids, or a mixture of the two can oxidize organic compounds, wet ashing can be used to remove elements that may be substantially dissolved during dry ashing, which includes Fe, Se, Pb, and Hg.

Apparatus and Equipment:

- ✓ Muffler furnace
- ✓ Spatula
- ✓ Weight machine Blanche
- ✓ Metal tong
- ✓ Heat resistant gloves
- ✓ Desiccator
- ✓ Crucible

Procedures:

Preparation of Crucible

After cleaning, put the crucible into the oven. Once the crucible has dried for 20 minutes at 150°C, take it out of the oven and set it aside to cool in a desiccator. A crucible can now be used to investigate ash.

Preparation of Sample

Find out how much the blank crucible weighs.
Fill the crucible with 3–4 g of the sample.
Note the weight of the sample.

Combustion/Burning

Turn on the power to the muffle furnace.
Place the crucible containing the sample into the furnace with caution.
Shut the Muffle burner cover with a firm grip.
A six-hour timer and a 600°C temperature setting should be set.
Switch on the Furnace Muffle.
After six hours, carefully open the door and switch off the electricity.
The crucible should be taken out of the Muffle burner and placed in the dryers for cooling.

Weight
Taking the last weight.

Determine the crucible's final weight that contains ash now.

Calculation:

$$\textbf{Ash \%} = \frac{W_a - W_c}{W_s} \times 100$$

where,

Sample weight =**Ws**
Crucible weight = **Wc**
Crucible with ash weight = **Wa**

Figure 4: Ash analysing on Muffle Furnaces

4.3 Determining Crude Fat Content:

The Association of Official Analytical Chemists (AOAC) considers the "Soxhlet" method to be the preferred approach for determining crude fat. Each evaluation using the Soxhlet technique to determine crude fat percentage can take up to a day. Just the solvent separation phase takes six hours.

Measuring the fat that is collected after it has been extracted from an object using a solvent allows us to determine the crude fat concentration. The sample is maintained in a porous cap so that the solvent can completely envelop it. The solvent can be reused several times because the thimble is encased in extraction apparatus. By doing this, the solvent has more time to interact with the sample and absorb all the remaining fat. The sample needs to be sliced as thinly as possible in order to make it possible for the solvent to completely penetrate it. Prior to starting the solvent extraction process, the sample needs to be dried. It is frequently necessary to undertake the moisture and fat analysis, which can be done by precisely weighing the sample before as well as after drying. Only the sample's weight before and following drying should be measured if a moisture evaluation is not necessary. The sample needs to be precisely measured with an analytical scale at every step of the analysis. It is important to weigh the sample without losing any of its moisture that can slip out throughout the process. Weigh the sample straight into a pre-dried the extraction thimble or, alternately, onto pre-dried filter paper to prevent moisture loss. If a moisture analysis is needed, the dried the extraction thimble or filtering paper also needs to be pre-weighed. Weigh the sample and then put it (the filter paper or thimble) in the heated oven to dry. The sample can be put straight into the distillation apparatus for extraction when it has dried.

Calculation:

- Crude fat% = $\frac{W2-W1}{Ws} \times 100$

where,

Sample weight = Ws
Thimble before the extraction of fat = W1
Thimble with fat after the extraction of fat = W2

4.4 Determining Protein Content:

Crude protein determination using the Kjeldahl method.

The Kjeldahl method is divided into three steps, which must be followed in the correct order:

01. The substance is digested in strong sulfuric acid using a catalyst to transform the amine nitrogen to the ions of ammonium.
02. After forming ammonia gas, the ammonium ions are extracted. The ammonia gas is entered for trapping, where it turns into an ammonium ion.
03. A computation is then performed after measuring the amount of ammonia trapped using titration with a standard solution.

The list of Chemical/Reagent:

Digestion:

01. Catalyst (Potassium Sulphate+ Copper Sulphate)
02. Sulfuric acid (concentrate 95%-98%)

Get a sample of digestion. The digestion flask should contain sulfuric acid 10 mL, digestion mixture 4g and the result 2g. We need 2 digestion flasks for calculating the mean value. Turn up the temperature after for 3 to 4 hours. There will be no sulfuric white smoke produced at the end, and the answer will be perfectly obvious. Allow it some time to relax.

Distillation:

01. Solution of Sodium Hydroxide 1.40%
02. Solution of Boric Acid 2.4%

Fill a volumetric flask with 100ml of distilled water to level the solution. 10 mL should be transferred from the volumetric flask to the distillation flask. Add 150 mL of distilled water and 10 mL of 40% NaOH to the distillation flask. To use this approach, fill the contents of a conical flask with two drops of the methyl red solution (1%) and fifty milliliters of distilled water, 0.1 HCL (10 milliliters), and one empty distillation flask. Just drink 150 mL of water with no contaminants and 10 mL of 40% Noah without sending in a sample for IC. We used three trapping solutions for all three trapping cylindrical flasks while keeping everything else the same. Condenser equipment after 30 minutes of operation.

Titration:

01. Hydrochloric acid (0.1N)
02. Methyl red indicator (0.1%)

Fill the burette with 0.1 NaOH. Titrate three times, using the trapping solution. At last, the color which is pink turned into bright yellow.

Calculation:

The crude protein percentage of this crackers was determined by using this formula

- $N\% = \frac{(\mathbf{V1} \times \mathbf{n1} \times \mathbf{F1} \times \mathbf{MWn})}{(\mathbf{Ws} \times \mathbf{10})}$
- Crude protein% = $\boldsymbol{N}\% \times \boldsymbol{factor} \times \boldsymbol{F2}$

where,

Ws = Sample Weight(g)
V1 = Volume of 0.1N
n1 = Normality
F1 = Acid factor
MWn = Molecular weight of nitrogen
Factors:
For wheat grains = 5.70
For mango juice = 5.70
F2 = Dilation factor 10 ml

4.5 Determining Crude Fiber Content:

Fibre Content Determination:

Calculation:

- Crude Fibre% = $\frac{(\boldsymbol{W2} - \boldsymbol{W3})}{\mathrm{W1}} \boldsymbol{x\ 100}$

where,

W1 = sample weight (1g)
W2 = C/W with fibre and ashes, after drying for100°C for 2h
W3 = crucible weight with ashes, after muffle a t600°C for 2h

Figure 5: Procedures of crude fiber determination

4.6 Sensory Evaluation

A nine point hedonic scale was used to evaluate cakes based on their sensory qualities. The group which consisted of 30 students and 5 faculty member from the department of Nutrition and Food Engineering at Daffodil International University, evaluates the sensory aspects of cakes such as texture, taste, appearance of colors, lasting appearances and overall acceptance.

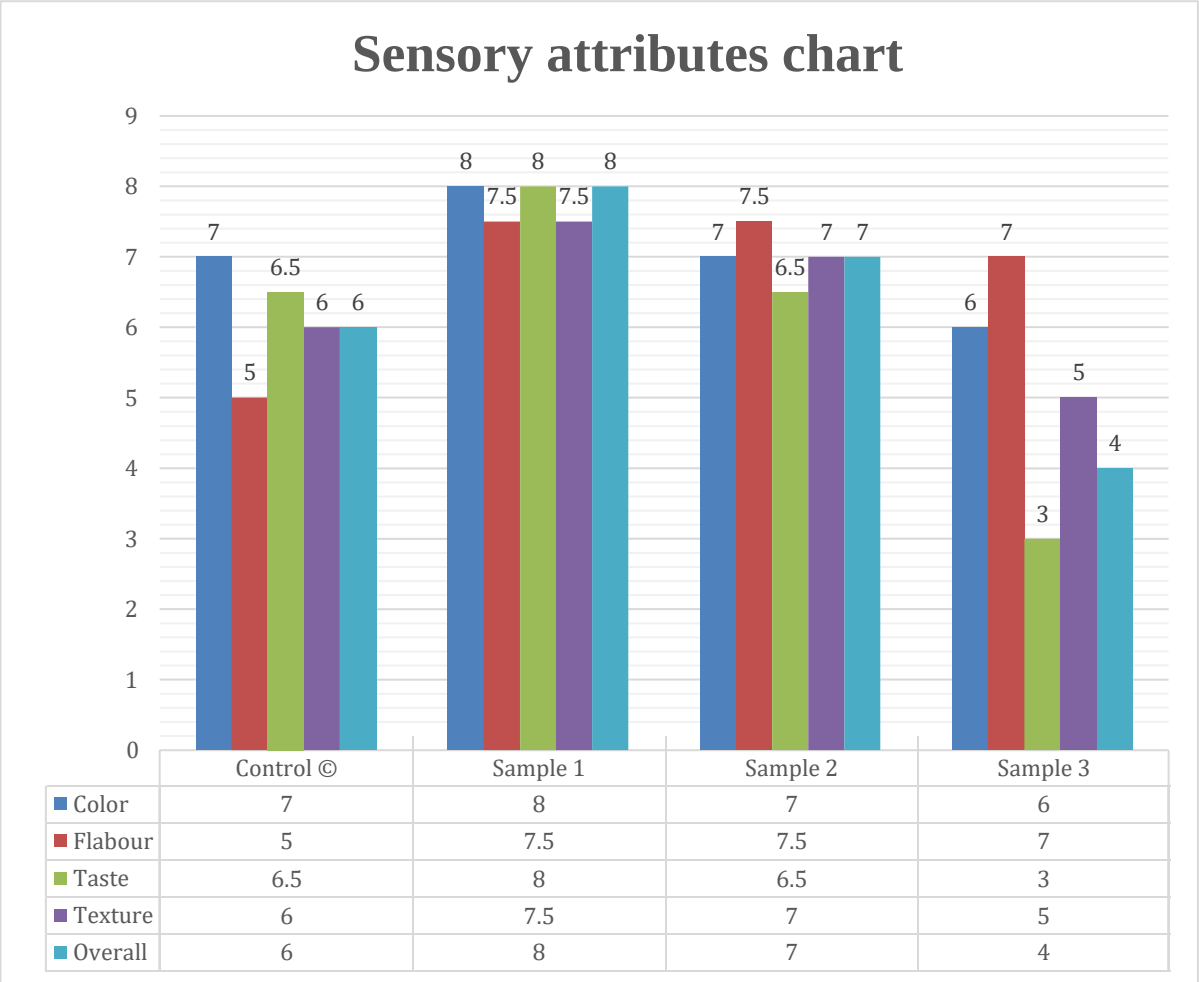
9.Like extremely
8.Like very much
7.Like moderately
6.Like slightly
5.Neither like or dislike
4.Dislike slightly
3.Dislike moderately
2.Dislike Very much
1.Dislike Extremely

Fig 6: Hedonic Scale

Testers rated the sample based on the provided scales. Commentson the products quality, flavor, odor and appearance. The outcome is determined using the item with the most votes.

Sensory Evaluation data:

Below are the average scores obtained from the sensory assessment results:



	Control ©	Sample 1	Sample 2	Sample 3
Color	7	8	7	6
Flabour	5	7.5	7.5	7
Taste	6.5	8	6.5	3
Texture	6	7.5	7	5
Overall	6	8	7	4

Figure 7: Sensory attributes Chart

4.7 Total Bacterial Count using Serial Dilution Method:

Principle:

The process of repeatedly diluting an ingredient in solution is known as serial dilution. Usually, there is an exponential geometrical growth in concentration when the dilution factor stays constant at each step. The following could be a ten-fold serial dilution: A: 1, B: 0.1, C: 0.01, D: 0.001 M. Both testing and highly diluted solutions are meticulously created via serial dilutions.

Apparatus and Materials:

- ✓ Petri-dish
- ✓ Aluminium Foil
- ✓ Micro-pipette
- ✓ Measuring Cylinder
- ✓ Conical Flask
- ✓ Electronic Balance
- ✓ Test Tube Stand
- ✓ Beaker
- ✓ Laboratory Films
- ✓ Spatula
- ✓ Autoclave
- ✓ Hot Plate
- ✓ Test Tube
- ✓ Media
- ✓ Incubator

Figure 8: Apparatus and materials

Procedure:

- ✓ Add 200ml of distil water to a conical flask and dissolve your selective medium.
- ✓ Once completely dissolved, combine with a hot plate.
- ✓ After mixing, check and adjust the pH level as needed.
- ✓ Autoclave for 30 to 45 minutes at 121°C and 15 psi. (Note: Some media may not require autoclaving). SS Agar Experiment.
- ✓ After autoclaving, keep all apparatus and medium under laminar air flow to avoid contamination.
- ✓ Perform the following operations in laminar air flow to address contaminants.
- ✓ Pour the media into the Petri dish and leave for a few minutes to solidify.
- ✓ Once your sample has solidified, add 0.5ml to the medium.
- ✓ Used laboratory films.
- ✓ Incubate for 16 to 24 hours at 35 to 37°C.

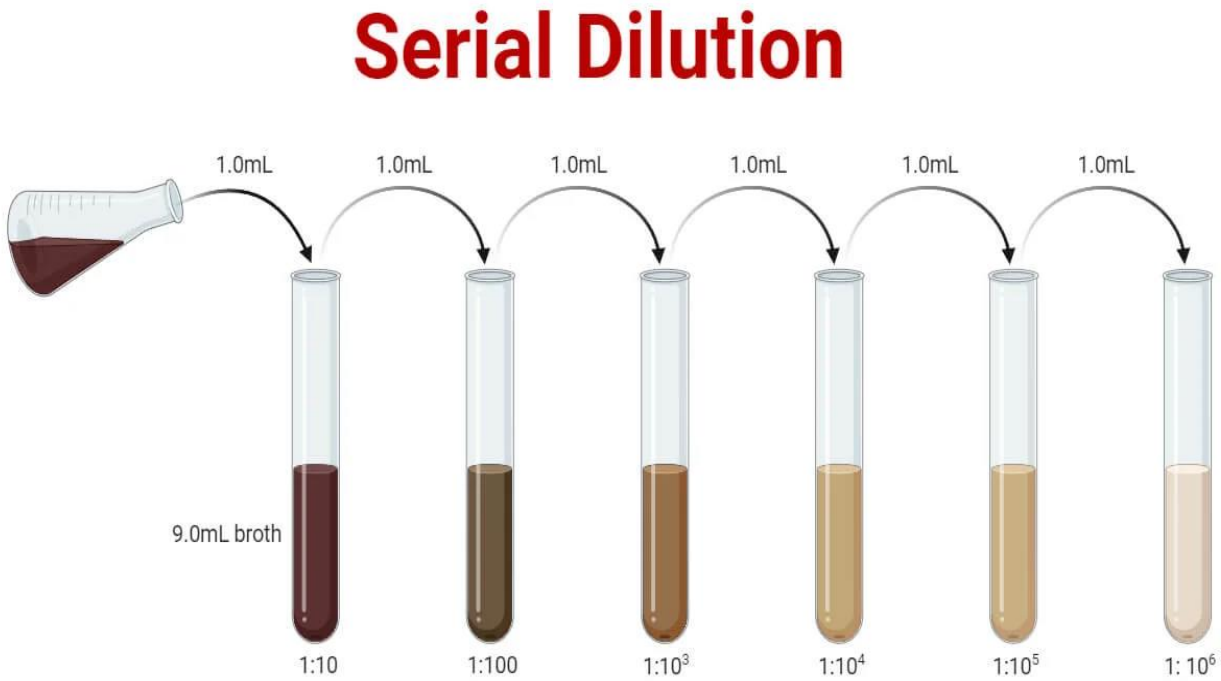


Figure 9: Serial dilution method process

Calculation:

$$\textbf{CFU} = \frac{Number\ of\ colony}{Inoculum\ volume\ of\ sample \times dilation\ factor}$$

CFU count:

Sample 1 (37 × 10000) = 37000 cfu/ml
Sample 2 (43 × 10000) = 43000 cfu/ml
Sample 3 (56 × 10000) = 56000 cfu/ml
(Control) (28 × 10000) = 28000 cfu/ml

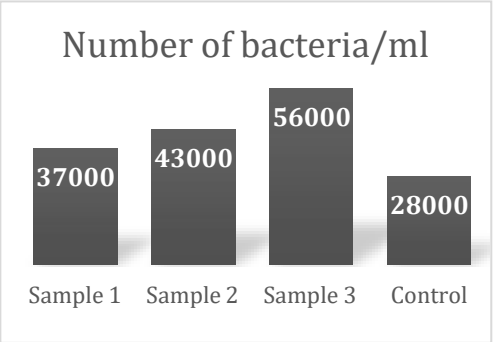


Figure 10: Total bacteria count chart

CHAPTER 5

Discussion

This chapter presents the findings of a proximate analysis of cake with mango juice and mango juice.

Moisture:

Moisture content tells whether there is any water in the food product. Water helps food to enter the cells of bacteria, yeast, and molds, where it is converted into energy for growth. The high moisture content is what causes microbial growth. Cakes benefit greatly from having a lower moisture content (within a range). In this investigation, I created and evaluated four samples designated (C), S1, S2, and S3, yielding findings of 18.25%. 23.25%, 26.86%, and 30.078%, respectively. The proportion of moisture varies depending on how much juice is used.

Ash Content:

Food ash is the mineral and inorganic material that remains after a food sample has been heated to 550-600°C to eliminate moisture, volatiles, and organics. A higher ash percentage suggests that more minerals and inorganic elements are present in the diet. The ash content of the samples (C, S1, S2, and S3) were 1.901%, 2.08%, 2.34%, and 2.59%, respectively. Although the shift is small, the percentage is substantially greater in sample 3. The percentage of ash changes as the amount of juice utilized varies.

Protein Content:

Mango is a fruit, hence it does not have a lot of protein. Protein content of the samples (C, S1, S2, and S3) was 5.82%, 6.02%, 6.16%, and 6.29%, respectively. So, there isn't much difference in protein content between the cake samples. There is also very little difference between the control and sample groups.

Proximate Result Table 2:

Proximate Result

Analysis	Control	Sample 1	Sample 2	Sample 3
Moisture	18.25%	23.25%	26.86%	30.078%
Ash	1.901%	2.081%	2.34%	2.59%
Protein	5.82%	6.02%	6.16%	6.29%
Crude fiber	1.24%	2.48%	2.61%	2.93%
Crude fat	26.04%	26.05%	26.08%	26.12%

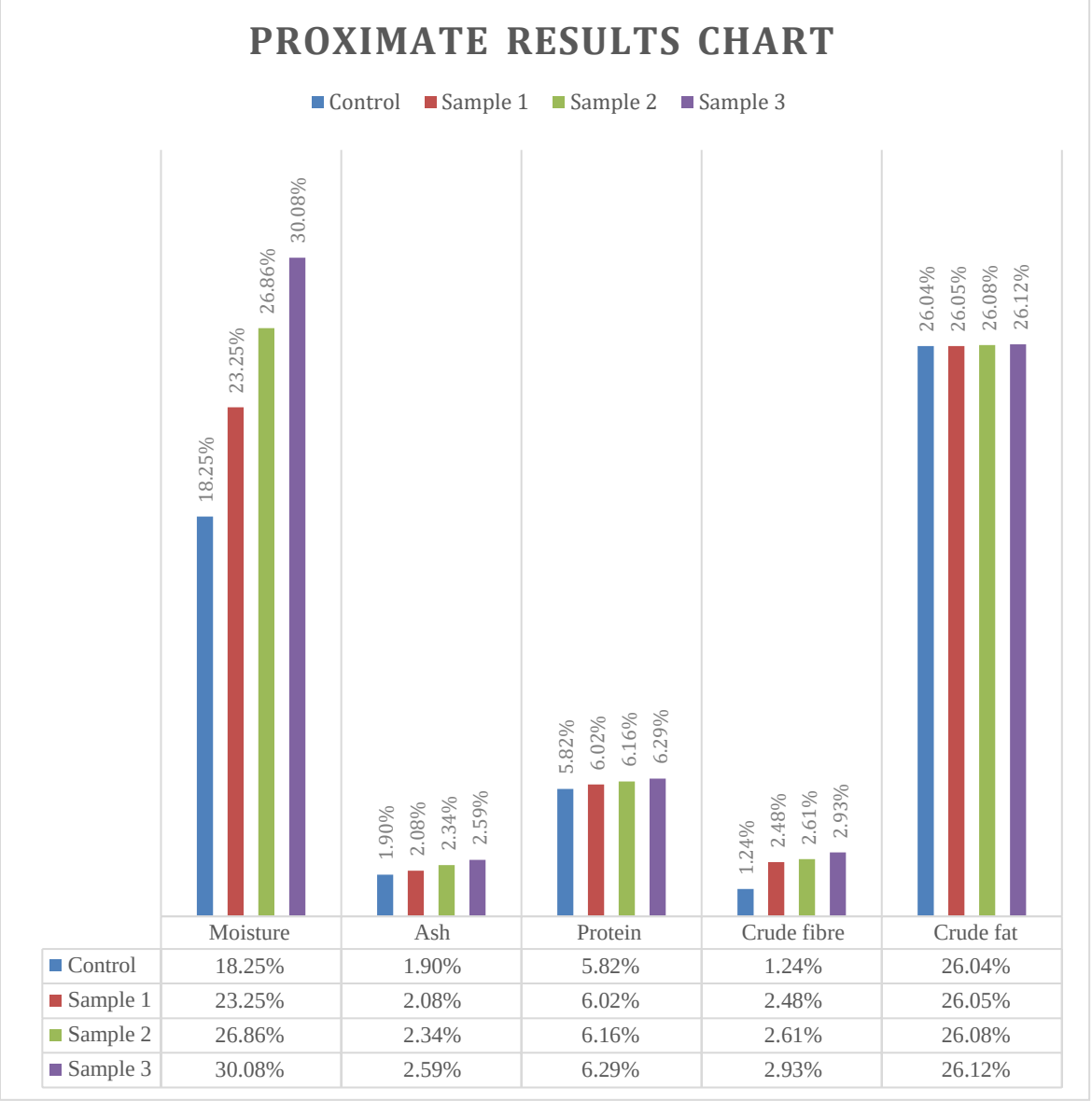


Figure 11: Proximate Results chart

Crude Fibre:

Fiber is one of the most essential goals of this study. Mango fruits are high in dietary fiber. In this recipe, I used mango juice and flesh. According to one study, the juice of mango fruit contains between 65 and 85 percent fiber. (C Gamonpilas, 2021) The meat also contains approximately 1% fiber. The fibre content of samples C, S1, S2, and S3 was found to be 1.24%, 2.48%, 2.61%, and 2.93% correspondingly. So, with the addition of juice and flesh, there is a significant difference in fiber content between the sample and the control. Variations in the quantity of flesh juice cause just a minor difference in fiber % in samples.

Crude Fat:

Mango fruits contain very little fat. The fat content of samples C, S1, S2, S3 was found to be 26.04%, 26.05%, 26.08%, and 26.12%, respectively. Similarly, the fat content of the samples remained quite stable. This study found that adding mango had no effect on the fat level of the cake.

According to the findings thus far, adding juice to these cakes greatly enhances the amount of nutrients and fiber. The key components in mango include fiber, which aids digestion and may lower the risk of a variety of ailments. Minerals found in flesh juice help to improve the immune system, promote appropriate growth and development, and support cell and organ function.

CHAPTER 6

Conclusion:

To achieve the appropriate product composition, four distinct cakes were created in the study, each with varying percentages of mango flesh liquid juice combined with other ingredients. Products generated were analyzed using a number of methodologies such as humidity, powder, fiber and cholesterol percentages, which were found to be 23.25%, 2.081%, 6.02%, 2.48%, and 26.05%, respectively. In addition, organoleptic assessments found that sample 1 is the most acceptable product in terms of sensory qualities such as texture, color, taste, flavor, and general acceptability.

Sample 1 (s1) included whole grain flour, white sugar, butter, milk, eggs, baking powder, salt, mango juice concentrate in proportions of 22%, 21.89%, 14.91%, 15.01%, 22.02%, 1.06%, 1.06%, 0.22%, 1.05%, and 5% of the total weight of the mixture. Only the juice content differed amongst the three formulations, with S1, S2, and S3 making up 5%, 10%, and 15% of the total mixing weight, respectively. A control product called Sample 4(C) or S4(C) was created for comparison. Moisture, ash, protein, fiber, and fat were among the parameters examined on the manufactured products. The sensory and microbiological percentages of maximum acceptable product sample 1 were 23.25%, 2.081%, 6.02%, 2.48%, and 26.05%, respectively.

Therefore, before concluding the market analysis for marketing, a follow-up study to assess the antioxidant content might be carried out and all of the needed elements of the products. The development of this product may result in a healthy and nutritious option for the general public.

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