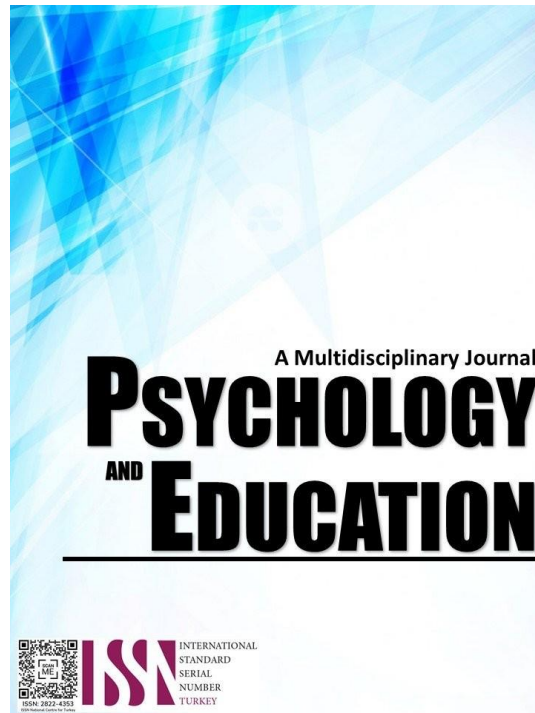


# PRODUCTION OF BLUE PACATO ICE CREAM



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## Production of Blue PACATO Ice Cream

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### Abstract

This study aimed to determine the Production of the Blue PACATO ice cream with papaya, carrot and tomato in different proportion 30g, 60g, 90g with blue ternate. The produced product was evaluated by food expert, ice cream vendors and consumers from Barangay San Isidro, Antipolo City, during the school year 2023-2024. The experimental method of research was used with a survey questionnaire as the data gathering instrument. The results of the physicochemical analysis test affirm that Blue PACATO ice cream is safe for consumption and offers numerous health benefits due to the presence of various nutritious ingredients carefully incorporated into its formulation. The consumer, ice cream vendor and food expert evaluated the appearance, aroma, taste, and texture of the produced Blue PACATO Ice cream with 30 grams and 60 grams as Very Acceptable, while 90 grams was evaluated as Extremely Acceptable. In addition, the level of marketability of the product was assessed as Very High Potential. Comments and suggestions were given by the respondents to further improve the product.

**Keywords:** *physicochemical, marketability, ice cream*

### Introduction

People of all ages enjoy ice cream as a favorite dessert worldwide. There is something for everyone, ranging from traditional tastes like chocolate and vanilla to more unusual choices like bubblegum or avocado. The market for ice cream was estimated to be worth USD 79.0 billion globally in 2021, and between 2022 and 2030, it is projected to increase at a compound annual growth rate (CAGR) of 4.2%. The market is anticipated to rise due to factors like the growing desire for novel flavors and varieties as well as the rising demand in developing nations for ice cream snacks such cones, sandwiches, and pops. In the approaching years, it is also anticipated that customers' growing health consciousness will increase demand for premium ice creams.

A frozen dairy treat, ice cream is made by continuously stirring an ice cream mix while it freezes. It includes egg products, sweeteners, stabilizers, colors, and flavors along with milk products. It is advised that ice cream serves as an effective probiotic delivery system. Its easily digested calcium and high-quality protein make it beneficial. It offers a wealth of nutrients and can contribute in a practical and pleasurable way to the daily energy intake in a diet that is both balanced and healthful.

All year round, eating ice cream is enjoyable, but during the summer, it just makes you feel better. As everyone knows, ice cream helps us feel better in hot weather. A portion of us consume ice cream purely out of want. Some of us consume it to help us feel better when we're depressed. In addition to its physical impacts, ice cream has psychological and mental health effects. Among the many benefits that ice cream lovers can experience are increased motivation to finish tasks, lowered stress levels, calmed emotions, and a deep sense of fulfillment. Studies show that nutrients that are high in fat and protein help our body elevate our mood. Amino acids are absorbed by the body and raise serotonin production and levels. For this reason, we experience serenity, happiness, and a sense of fulfillment.

The Food and Drug Administration (2018) states, seven artificial additives were formally outlawed by the FDA; these include some of the most widely used artificial flavorings in confectionery, baked products, ice cream, and chewing gum. Following significant study that revealed these compounds had a carcinogenic effect on lab animals, the FDA announced that these additives will be removed from its approved list. Some of the most widely used compounds in consumer items that mimic natural mint, citrus, and cinnamon scents are benzophenone, ethyl acrylate, eugenyl methyl ether, myrcene, pulegone, and pyridine, which were recently outlawed. The petitioners presented proof showing these chemicals caused cancer in animals given far larger dosages, the FDA stated in a news release.

Based on the observations and theories, the researcher came to the realization that there was an opportunity to innovate ice cream for three primary reasons. Firstly, as a delightful and nutritious snack option, it could cater to the dietary needs of teenagers and children who may not always consume enough healthy fruits and vegetables. With statistics showing that only two out of ten teenagers are meeting the recommended intake of fruits and vegetables, there is a clear need for alternative sources of nutrition. Additionally, the creation of new ice cream variants could provide economic opportunities for financially struggling Filipinos, enabling them to generate additional income. Ice cream, being a popular and in-demand product, could serve as a stable source of revenue for individuals looking to improve their financial situation. Furthermore, by sourcing ingredients from local farmers, this innovation could also have a positive impact on the agricultural sector by supporting farmers through increased demand for their produce. Not only does this benefit the farmers financially, but it also promotes the use of fresh, high-quality ingredients in the production of healthy ice cream varieties. Finally, the nutritional value of this innovative ice cream makes it an ideal snack option for schools aiming to promote healthy eating habits among students. By offering a tasty yet nutritious treat, schools can encourage students to make healthier food choices while still enjoying what they eat.

## Research Questions

This study aimed to determine the Production of the BLUE PACATO ice cream with papaya, carrot and tomato in different proportion, 30g, 60g, 90g with blue ternate extract as evaluated by food expert, ice cream vendors, and consumers in Barangay San Isidro, Antipolo City, during the 2023-2024. More specifically, this study sought answers to the following questions:

1. How can BLUE PACATO ice cream be produced using papaya, carrot, tomato and blue ternate extract?
2. What is the physicochemical analysis of the BLUE PACATO ice cream based on the following parameters:
  - 2.1. protein;
  - 2.2. fats;
  - 2.3. carbohydrates; and
  - 2.4. vitamin A?
3. Based on the following criteria, how do food expert, ice cream vendor and consumers assess the acceptability of BLUE PACATO ice cream:
  - 3.1. appearance;
  - 3.2. aroma;
  - 3.3. taste; and
  - 3.4. texture?
4. Are there significant differences among the level of acceptability of Blue PACATO ice cream based on the three groups of respondents in terms of the aforementioned criteria?
5. Based on the following criteria, how do food expert, ice cream vendor and consumers assess the marketability of BLUE PACATO ice cream:
  - 5.1. product cost;
  - 5.2. supply availability;
  - 5.3. consumer demand; and
  - 5.4. packaging and labeling?
6. Are there significant differences among the level of marketability of Blue PACATO ice cream pea based from the three groups of respondents in terms of the aforementioned criteria?
7. What are the comments and suggestions offered by the respondents to further improve the Blue PACATO ice cream?

## Literature Review

According on the article of Britannica. A. Tikkanen (2023) Ice cream, frozen dairy food made from cream or butterfat, milk, sugar, and flavorings. Frozen custard and French type ice creams also contain eggs. Hundreds of flavors have been devised, the most popular being vanilla, chocolate, and strawberry. Commercial ice cream is made by combining, under constant agitation, the liquid ingredients (milk, cream, syrups, etc.). Ian Farell, (2021) claimed that eating ice cream on a hot day feels incredibly gratifying and revitalizing. Ice cream has been around for a very long time. According to some reports, dishes that resemble ice cream originated in Persia around 550 BC. It is also claimed by some that the Roman Emperor Nero made sorbet by gathering snow from the mountains and combining it with wine and honey. There are countless varieties of ice cream available these days, ranging from gourmet gelatos and unique savory flavors to the classic flavors seen in ice cream vans.

As reported by Medical News Today – Megan Ware (2022) Carrots are a common ingredient in many juices, as they provide a flavor that pairs well with many other fruits and vegetables. Aside from its taste, carrot juice may also provide numerous health benefits. These possible benefits include reducing the risks of many different health conditions. Making carrot juice at home is also possible using juicing equipment. Carrot juice is highly nutritious and may be beneficial for preventing a range of health conditions.

In addition, based on NCBI, PubMed Central (2022), *Solanum Lycopersicon*, or tomatoes, are an excellent source of minerals, iron, potassium, lycopene, folate, and vitamin C. Tomatoes include phenolic components such flavonoids, hydroxycinnamic acid, chlorogenic acid, homovanillic acid, and ferulic acid in addition to lycopene and vitamin C. With their nutritional worth intact, tomatoes can be eaten raw or cooked and can play a significant role in a balanced diet. More than 80 percent of tomatoes that are farmed commercially are used to make processed foods like ketchup, soup, and juice. Tomatoes and tomato-based foods are known to provide several health benefits, many of which are linked to their high antioxidant content.

As explained by MDPI food Journal (2021). In tropical nations, papayas are among the most valuable and profitable fruits. However, a significant amount of unripe papaya trash and by-products are produced by the fruit processing businesses. Unripe papaya powder (UPP) was produced and added to pancake batter to cut down on waste.

## Methodology

### Research Design

This study employed the experimental research method to ascertain whether innovation in the papaya, carrot, and tomato produced higher quality in terms of its appearance/color, aroma, taste, and texture. Experimental research design, as defined by Sirisilla (2023),

is a set of guidelines and practices developed to carry out scientifically minded experimental research utilizing two sets of variables. Here, the first set of variables serves as a constant and is employed to calculate the second set's differences. Quantitative research is the best illustration of experimental research methodologies.

### Respondents

There were ninety respondents in total, including thirty FSM teachers from Marikina Polytechnic College and Bagong Nayon II National Highschool, thirty ice cream vendors, and thirty consumers from Antipolo City.

### Instrument

The instrument used to gather data was the survey questionnaire. The appearance, aroma, taste, and texture of BLUE PACATO Ice cream were evaluated by the three groups of respondents using the Nine-point Hedonic Scale.

### Procedure

The researcher developed the survey questionnaire, and it marked the beginning of the data collection process. A letter of consent from the responders was also written by the researcher. The instructions for completing the questionnaire were briefly presented to help the respondents. The researcher selected thirty food experts, thirty ice cream vendors, and thirty Ice cream consumers at random to administer the survey questionnaire for the evaluation of the Blue PACATO ice cream. The researcher also kept records of the entire data collection process.

### Ethical Considerations

Before starting the study by collaborating with the respondents, the researcher went over and explained the objective of the study. Along with a letter encouraging respondents to complete the necessary questionnaire voluntarily and thoroughly, the researcher also provided a consent document for the study.

The data collected from the respondents would remain the most private and confidential and only be utilized for the purpose of the study. As such, the researcher had considered protecting the privacy of the respondents and others. This was done in compliance with RA 10173, also referred to as the Data Privacy Act of 2012.

## Results and Discussion

This section presents the findings according to the study's research questions.

### Production of Blue PACATO Ice Cream

To produce Blue PACATO ice cream, these procedures were performed: For PACATO Jam, first, get everything ready using the mise en place method. Arrange all ingredients and materials in an organized manner. Then, start by making PACATO Jam as the main flavor of the ice cream. Follow these steps: steam the carrots until soft, blend together papaya, carrots, and tomatoes. Once blended, cook the mixture in a pan over medium heat, gradually adding sugar and stirring until it boils. Add pectin, then increase the heat to high flame. Check the temperature with a candy thermometer. After reaching the standard temperature transfer to a clean glass container. Moreover, for producing BLUE PACATO Ice cream has seven key points to perform; a) By using mise en place method, put everything in clean and ready to use things and materials needed, b) by using electric mixer put heavy cream and mix until double its volume, c) gradually add whole milk with blue ternate extract, d) Mix well until it is evenly distributed. Once it's done, e) add gelatin gradually in slow motion, f) immediately after, put the PACATO Jam flavor in cut and fold motion for evenly distributed, g) then put container and place it inside the freezer with negative eighteen degree Celsius.

### Physicochemical Analysis of the BLUE PACATO Ice cream

Table 1. Summary of Physicochemical Analysis Result of BLUE PACATO Ice cream

Parameters	Unit	Test Method	Results
Protein	g/100g	Kjeldahl	1.58g
Fat	g/100g	Base Hydrolysis – Mojonnier Extraction	10.0g
Carbohydrates	g/100g	By Computation	19.2g
Vitamin A	IU/100g	HPLC	558g

The table shows the comprehensive physicochemical analysis test conducted on Blue PACATO Ice cream. This is supported by the study of Jootamas Moolwong (2023) which may have health advantages, with a detailed discussion on each parameter, the findings suggest that the protein 1.58g content, fat 10.0g and carbohydrate 19.2g, it is observed to be marginally close to the typical range for ice cream. For vitamin A 558g content also align closely with the established standards for ice cream. These results affirm that Blue PACATO ice cream is safe for consumption and offers numerous health benefits due to the presence of various nutritious ingredients carefully incorporated into its formulation.

## Level of Acceptability of the Produced Blue PACATO Ice

Table 2. *Level of Acceptability of the Produced Blue PACATO Ice Cream with 30 Grams Proportion in Terms of Appearance*

Indicator The Blue PACATO ice cream...	Consumer		Ice Cream Vendor		Food Expert	
	WM	VI	WM	VI	WM	VI
1. is visually appealing.	6.67	MA	7.87	VA	8.17	EA
2. is similar like the common ice cream.	6.90	MA	7.53	VA	7.73	VA
3. has distinctive color.	6.40	MA	7.67	VA	7.77	VA
4. has even color.	6.53	MA	7.80	VA	8.10	VA
5. has light and soft appearance.	6.60	MA	8.10	VA	8.30	EA
Weighted Mean	6.63	MA	7.98	VA	8.23	EA

In terms of the appearance of the produced Blue PACATO ice cream with 30 grams proportion, consumers, ice cream vendors, and food experts gave various scores, indicating varying levels of acceptance. Consumer feedback provided a reasonably satisfactory rating with a weighted mean of 6.63 verbally interpreted as moderately acceptable, ice cream vendors rated it extremely acceptable, getting 7.98, and the food expert gave an extremely acceptable rating, with a weighted average of 8.23. These assessments collectively indicate that the generated blue PACATO ice cream, crafted in a 30g proportion, has a visually appealing presentation defined by a distinct, even color and a light, soft consistency reminiscent of conventional ice cream variations.

Table 3. *Level of Acceptability of the Produced Blue PACATO Ice Cream with 30 Grams Proportion in Terms of Aroma*

Indicator The Blue PACATO ice cream...	Consumer		Ice Cream Vendor		Food Expert	
	WM	VI	WM	VI	WM	VI
1. has pleasant smell.	6.77	MA	7.87	VA	7.60	VA
2. has a natural aroma.	6.53	MA	7.73	VA	7.97	VA
3. has an appetizing smell.	6.57	MA	7.63	VA	7.70	VA
4. has sweet smell.	6.23	SA	7.53	VA	7.60	VA
5. has fruity smell.	6.50	MA	7.47	VA	7.30	VA
Weighted Mean	6.65	MA	7.67	VA	7.45	VA

In terms of the aroma of the produced Blue PACATO ice cream with 30 grams proportion, the consumers rated it as moderately acceptable with a weighted mean of 6.65. On the other hand, the ice cream vendors and food experts found the produced Blue PACATO ice cream to be very acceptable, giving it a weighted mean of 7.67 and 7.45, respectively. This indicates that the Blue PACATO ice cream with a 30g proportion boasts a delightful fragrance that is both appetizing and fruity. The scent is reminiscent of natural ice cream, offering a pleasant and sweet olfactory experience.

Table 4. *Level of Acceptability of the Produced Blue PACATO Ice Cream with 30 Grams Proportion in Terms of Taste*

Indicator The Blue PACATO ice cream...	Consumer		Ice Cream Vendor		Food Expert	
	WM	VI	WM	VI	WM	VI
1. has perfectly balance flavor.	6.83	MA	7.40	VA	7.83	VA
2. has its own unique taste.	7.40	VA	7.53	VA	8.37	EA
3. is palatable.	7.27	VA	7.53	VA	8.20	EA
4. has sweet and fruity flavor.	7.13	MA	7.30	VA	7.47	VA
5. is free from aftertaste.	7.43	VA	7.53	VA	8.23	EA
Weighted Mean	7.13	MA	7.47	VA	8.03	VA

Consumer feedback suggests a moderately acceptable, with a weighted average score of 7.13. In contrast, ice cream vendors and food experts gave the identical ice cream good ratings, with weighted mean scores of 7.47 and 8.03 as very acceptable, respectively. These tests indicate that the Blue PACATO ice cream with a 30 grams proportion has a well-balanced, sweet, and fruity flavor profile, with a distinct taste that is free of any unpleasant aftertaste, making it highly enjoyable.

The two groups of respondents evaluated it as very acceptable with weighted means of 8.10, and 7.88, respectively to ice cream vendors and food experts while the consumers evaluated with weighted mean of 6.75 as moderately acceptable.

It boasts exceptional qualities such as a delightful melting quality, rich creaminess, luxurious smoothness, and a pleasantly soft texture that creates a velvety indulgence for those enjoying it. These characteristics not only appeal to consumers but also cater to the discerning preferences of ice cream vendors and food experts.



Table 5. Level of Acceptability of the Produced Blue PACATO Ice Cream with 30 Grams Proportion in Terms of Texture

Indicator The Blue PACATO ice cream...	Consumer		Ice Cream Vendor		Food Expert	
	WM	VI	WM	VI	WM	VI
1. is velvety.	6.53	VA	8.17	EA	7.93	VA
2. has melting quality.	6.30	SA	8.07	VA	7.90	VA
3. has creamy texture.	6.87	VA	7.93	VA	7.80	VA
4. has smooth texture.	7.03	VA	7.87	VA	7.73	VA
5. has soft texture.	6.97	VA	8.03	VA	7.83	VA
Weighted Mean	6.75	MA	8.10	VA	7.88	VA

Table 6. Level of Acceptability of the Produced Blue PACATO Ice Cream with 60 Grams Proportion in Terms of Appearance

Indicator The Blue PACATO ice cream...	Consumer		Ice Cream Vendor		Food Expert	
	WM	VI	WM	VI	WM	VI
1. is visually appealing.	7.67	VA	8.00	VA	8.37	EA
2. is similar like the common ice cream.	7.60	VA	7.80	VA	8.37	EA
3. has distinctive color.	7.03	MA	8.03	VA	8.37	EA
4. has even color.	6.83	MA	7.87	VA	8.47	EA
5. has light and soft appearance.	7.40	VA	8.13	EA	8.47	EA
Weighted Mean	7.53	VA	8.07	VA	8.42	EA

Both consumers and ice cream vendors have reported as very acceptable, with weighted mean scores of 7.53 and 8.07, respectively. The response reinforces its status as a preferred option, owing to its visually appealing design. This attraction is enhanced by its distinctive and constant colors, as well as its soft and light texture, which thrills the senses. Furthermore, food expert praised the ice cream's visual appeal, giving it a weighted mean score of 8.42 as extremely acceptable. This recognition not only emphasizes the product's outstanding quality, but also strengthens its commercial appeal.

Table 7. Level of Acceptability of the Produced Blue PACATO Ice Cream with 60 Grams Proportion in Terms of Aroma

Indicator The Blue PACATO ice cream...	Consumer		Ice Cream Vendor		Food Expert	
	WM	VI	WM	VI	WM	VI
1. has pleasant smell.	6.90	MA	8.30	EA	8.20	EA
2. has a natural aroma.	7.07	MA	8.20	VA	8.23	EA
3. has an appetizing smell.	7.27	MA	7.97	VA	8.13	EA
4. has sweet smell.	7.20	MA	8.00	VA	7.83	VA
5. has fruity smell.	6.90	MA	7.90	VA	7.87	VA
Weighted Mean	6.90	MA	8.10	VA	8.03	VA

The produced Blue PACATO ice cream with 60 grams proportion in terms of aroma has a moderately acceptable evaluation for consumers with a weighted mean of 6.90. While the ice cream vendors and food experts evaluated the produced blue PACATO ice cream as very acceptable with a weighted mean of 8.10 and 8.03 respectively.

This implies that the produced blue PACATO ice cream with 60 grams proportion has more pleasant, appetizing, sweet, and fruity smell that makes it smells like more natural ice cream.

Table 8. Level of Acceptability of the Produced Blue PACATO Ice Cream with 60 Grams Proportion in Terms of Taste

Indicator The Blue PACATO ice cream...	Consumer		Ice Cream Vendor		Food Expert	
	WM	VI	WM	VI	WM	VI
1. has perfectly balance flavor.	7.33	VA	7.73	VA	8.30	EA
2. has its own unique taste.	7.67	VA	7.97	VA	8.47	EA
3. is palatable.	7.47	VA	7.97	VA	8.33	EA
4. has sweet and fruity flavor.	7.50	VA	8.00	VA	7.87	VA
5. is free from aftertaste.	7.80	VA	7.97	VA	8.67	EA
Weighted Mean	7.57	VA	7.85	VA	8.48	EA

The produced Blue PACATO ice cream with 60 grams proportion in terms of taste has a very acceptable evaluation for consumers and ice cream vendors with a weighted mean of 7.57 and 7.85, respectively. While the food experts evaluated the produced blue PACATO ice cream with 60 grams proportion as extremely acceptable with a weighted mean of 8.48.

This implies that the produce blue PACATO ice cream with 60 grams proportion has more perfectly balance and sweet and fruity flavor, has its more own unique taste, and free from aftertaste that makes it more palatable.

Table 9. Level of Acceptability of the Produced Blue PACATO Ice Cream with 60 Grams Proportion in Terms of Texture

Indicator The Blue PACATO ice cream...	Consumer		Ice Cream Vendor		Food Expert	
	WM	VI	WM	VI	WM	VI
1. is velvety.	7.07	MA	8.20	EA	8.23	EA
2. has melting quality.	7.03	MA	8.23	EA	8.40	EA
3. has creamy texture.	7.77	VA	8.10	VA	8.50	EA
4. has smooth texture.	7.53	VA	8.17	EA	8.37	EA
5. has soft texture.	7.23	VA	8.17	EA	8.57	EA
Weighted Mean	7.15	MA	8.18	EA	8.40	EA

The produced Blue PACATO ice cream with 60 grams proportion in terms of texture evaluated by consumers moderately acceptable with a weighted mean of 7.15. While the ice cream vendors and food expert evaluated the produced blue PACATO ice cream with 60 grams proportion as extremely acceptable with a weighted mean of 8.18 and 8.40, respectively. This implies that the produced blue PACATO ice cream with 60 grams proportion has more melting quality, creamy, smooth, and soft texture that makes it more velvet.

Table 10. Level of Acceptability of the Produced Blue PACATO Ice Cream with 90 Grams Proportion in Terms of Appearance

Indicator The Blue PACATO ice cream...	Consumer		Ice Cream Vendor		Food Expert	
	WM	VI	WM	VI	WM	VI
1. is visually appealing.	8.00	VA	8.33	EA	8.23	EA
2. is similar like the common ice cream.	8.00	VA	8.20	EA	8.20	EA
3. has distinctive color.	7.47	VA	8.47	EA	8.13	EA
4. has even color.	7.40	VA	8.23	EA	8.33	EA
5. has light and soft appearance.	7.80	VA	8.50	EA	8.20	EA
Weighted Mean	7.90	VA	8.42	EA	8.22	EA

In terms of the appearance of the produced Blue PACATO ice cream with 90 grams proportion, the consumers evaluated it as very acceptable with a weighted mean of 7.90. While the ice cream vendors and food experts evaluated the produced blue PACATO ice cream as extremely acceptable with a weighted mean of 8.42 and 8.22, respectively. This implies that the produced blue PACATO ice cream with 90 grams proportion is the most visually appealing, has the most distinctive and even color, and has the most light and soft appearance that makes it most likely a common ice cream.

Table 11. Level of Acceptability of the Produced Blue PACATO Ice Cream with 90 Grams Proportion in Terms of Aroma

Indicator The Blue PACATO ice cream...	Consumer		Ice Cream Vendor		Food Expert	
	WM	VI	WM	VI	WM	VI
1. has pleasant smell.	7.67	VA	8.50	EA	8.27	EA
2. has a natural aroma.	7.90	VA	8.60	EA	8.37	EA
3. has an appetizing smell.	7.70	VA	8.30	EA	8.23	EA
4. has sweet smell.	8.07	VA	8.43	EA	7.93	VA
5. has fruity smell.	7.73	VA	8.47	EA	7.77	VA
Weighted Mean	7.70	VA	8.48	EA	8.02	VA

Consumer and food expert evaluated the ice cream as very acceptable with the mean of 7.70 and 8.02, while the ice cream vendors evaluated the produced blue PACATO ice cream as extremely acceptable with a weighted mean of 8.48. This implies that the produced blue PACATO ice cream with 60 grams proportion has the most

Table 12. Level of Acceptability of the Produced Blue PACATO Ice Cream with 90 Grams Proportion in Terms of Taste

Indicator The Blue PACATO ice cream...	Consumer		Ice Cream Vendor		Food Expert	
	WM	VI	WM	VI	WM	VI
1. has perfectly balance flavor.	8.17	EA	8.47	EA	8.33	EA
2. has its own unique taste.	8.40	EA	8.70	EA	8.43	EA
3. is palatable.	8.27	EA	8.67	EA	8.20	EA
4. has sweet and fruity flavor.	8.37	EA	8.77	EA	7.77	VA
5. is free from aftertaste.	8.23	EA	8.77	EA	8.33	EA
Weighted Mean	8.20	EA	8.62	EA	8.33	EA

In terms of the taste of the produced Blue PACATO ice cream with 90 grams proportion, the three groups of respondents evaluated it as extremely acceptable with a weighted mean of 8.20, 8.62, and 8.33, respectively to consumers, ice cream vendors and food experts. This implies that the produce blue PACATO ice cream with 90 grams proportion has the most perfectly balance and sweet and fruity flavor, has its most own unique taste, and free from aftertaste that makes it most palatable.



Table 13. *Level of Acceptability of the Produced Blue PACATO Ice Cream with 90 Grams Proportion in Terms of Texture*

Indicator The Blue PACATO ice cream...	Consumer		Ice Cream Vendor		Food Expert	
	WM	VI	WM	VI	WM	VI
1. is velvety.	7.83	VA	8.70	EA	8.13	EA
2. has melting quality.	7.87	VA	8.70	EA	8.23	EA
3. has creamy texture.	8.20	EA	8.57	EA	8.27	EA
4. has smooth texture.	8.23	EA	8.57	EA	8.10	VA
5. has soft texture.	8.17	EA	8.63	EA	8.33	EA
Weighted Mean	8.00	VA	8.67	EA	8.23	EA

In terms of the texture of the produced Blue PACATO ice cream with 90 grams proportion, consumer evaluated it as very acceptable with weighted mean of 8.00. While the ice cream vendors and food experts evaluated the produced blue PACATO ice cream with 90 grams proportion as extremely acceptable with weighted mean of 8.67, and 8.23, respectively. This implies that the produced blue PACATO ice cream with 60 grams proportion has the most melting quality, creamy, smooth, and soft texture that makes it most velvet.

**Significant Difference among the Level of Acceptability of the Three Groups of Respondents on the Produced Blue PACATO Ice Cream**

Table 14. *Summary of Significant Difference among the Level of Acceptability of the Three Groups of Respondents on the Produced Blue PACATO Ice Cream With 30 Grams Proportion*

Criteria	n	Computed p-value	Decision	Interpretation
a. Appearance	30	0.000	Reject the H <sub>0</sub>	Significant
b. Aroma	30	0.059	Fail to Reject the H <sub>0</sub>	Not Significant
c. Taste	30	0.178	Fail to Reject the H <sub>0</sub>	Not Significant
d. Texture	30	0.003	Reject the H <sub>0</sub>	Significant

It can be glanced that in terms of appearance and texture, the computed p-values of 0.000 and 0.003 at 5% level of significance and 89 degrees of freedom. The statistical decision is to reject the null hypothesis. Therefore, there is a significant difference among the level of acceptability of the three groups of respondents on the produced blue PACATO ice cream with 30 grams proportion.

Meanwhile, the p-values of 0.059 and 0.178 in terms of aroma and taste, accept the null hypothesis. Thus, there is no significant difference on the evaluation of the three groups of respondents in terms of aroma and taste.

Table 15. *Summary of Significant Difference among the Level of Acceptability of the Three Groups of Respondents on the Produced Blue PACATO Ice Cream With 60 Grams Proportion*

Criteria	n	Computed p-value	Decision	Interpretation
a. Appearance	30	0.012	Reject the H <sub>0</sub>	Significant
b. Aroma	30	0.018	Reject the H <sub>0</sub>	Significant
c. Taste	30	0.001	Reject the H <sub>0</sub>	Significant
d. Texture	30	0.004	Reject the H <sub>0</sub>	Significant

It can be glanced that in terms of appearance, aroma, taste, and texture, the computed p-values of 0.012, 0.018, 0.001, and 0.004 at 5% level of significance and 89 degrees of freedom. The statistical decision is to reject the null hypothesis. Therefore, there is a significant difference among the level of acceptability of the three groups of respondents on the produced blue PACATO ice cream with 60 grams proportion.

Table 16. *Summary of Significant Difference among the Level of Acceptability of the Three Groups of Respondents on the Produced Blue PACATO Ice Cream With 90 Grams Proportion*

Criteria	n	Computed p-value	Decision	Interpretation
a. Appearance	30	0.435	Fail to Reject the H <sub>0</sub>	Not Significant
b. Aroma	30	0.082	Fail to Reject the H <sub>0</sub>	Not Significant
c. Taste	30	0.150	Fail to Reject the H <sub>0</sub>	Not Significant
d. Texture	30	0.015	Reject the H <sub>0</sub>	Significant

It can be glanced that in terms of appearance, aroma, and taste, the computed p-values of 0.435, 0.082, and 0.150, at 5% level of significance and 89 degrees of freedom. The statistical decision is not to reject the null hypothesis.

Therefore, there is a no significant difference among the level of acceptability of the three groups of respondents on the produced blue PACATO ice cream with 90 grams proportion in terms of appearance, aroma, and taste. However, with the p-value of 0.015, the null hypothesis is rejected. Thus, there is significant difference in terms of texture.



**Level of Marketability of the Produced Blue PACATO Ice Cream**

Table 17. *Level of Marketability of the Produced Blue PACATO Ice Cream based on the data average result of 30g, 60g, and 90g proportion in terms of Consumer Demand*

Indicator The Blue PACATO ice cream...	Consumer		Ice Cream Vendor		Food Expert	
	WM	VI	WM	VI	WM	VI
1. can meet the demands of the consumer.	4.41	HP	4.21	HP	4.58	VHP
2. can compete with the other flavor of ice cream.	4.39	HP	4.21	HP	4.54	VHP
3. has higher health benefits for the consumer.	4.56	VHP	4.24	HP	4.72	VHP
4. fits for all ages.	4.58	VHP	4.34	HP	4.59	VHP
5. could be sold at lower price compared to other commercially sold ice cream.	4.57	VHP	4.36	HP	4.56	VHP
Weighted Mean	4.49	HP	4.28	HP	4.57	VHP

The table presented the respondents evaluation of the produced Blue PACATO ice cream in terms of consumers demand as very high potential with an overall weighted mean of 4.57 for food expert while the overall weighted mean and high potential with an overall weighted mean of 4.49 and 4.28 respectively to consumer and ice cream vendor. This implies that the produced Blue PACATO ice cream in terms of consumers demand probably can meet the demands of the consumer, it can compete with other flavor of ice cream, also has higher health benefits for the consumer that can fit for all ages, and it could be sold at lower price compared to other commercially sold ice cream. Thus, the produced Blue PACATO ice cream in terms of consumer demand is most preferred by the three groups of respondents.

Table 18. *Level of Marketability of the Produced Blue PACATO Ice Cream based on the data average result of 30g, 60g, and 90g proportion in terms of Production Cost*

Indicator The Blue PACATO ice cream...	Consumer		Ice Cream Vendor		Food Expert	
	WM	VI	WM	VI	WM	VI
1.ingredient are affordable.	4.67	VHP	4.33	HP	4.56	VHP
2. has a competitive price.	4.64	VHP	4.37	HP	4.64	VHP
3. can be sold easily.	4.62	VHP	4.34	HP	4.46	HP
4. needs little capital to produce the product	4.67	VHP	4.38	HP	4.50	VHP
5. need less manpower to make the ice cream.	4.60	VHP	4.38	HP	4.37	HP
Weighted Mean	4.63	VHP	4.36	HP	4.51	VHP

It shows that the respondents evaluated the marketability of the produced Blue PACATO ice cream in terms of production cost as very high potential with an overall weighted mean of 4.63 and 4.51 respectively to consumers and food expert. However, in ice cream vendor with verbal interpretation of high potential with overall weighted mean of 4.36. This implies that the produced blue PACATO ice cream in terms of production cost has affordable ingredients, it can be sold easily, has a competitive price, need little capital to produce the product and need less manpower to make the ice cream.

Table 19. *Level of Marketability of the Produced Blue PACATO Ice Cream based on the data average result of 30g, 60g, and 90g proportion in terms of Supply Availability*

Indicator The Blue PACATO ice cream...	Consumer		Ice Cream Vendor		Food Expert	
	WM	VI	WM	VI	WM	VI
1. ingredients are easy to find and always available on the market.	4.61	VHP	4.29	HP	4.66	VHP
2. raw material are locally available.	4.57	VHP	4.33	HP	4.68	VHP
3. ingredients are not easily spoiled or easy damage.	4.54	VHP	4.20	HP	4.38	HP
4. productions are available in any season.	4.61	VHP	4.36	HP	4.66	VHP
5. raw material need less effort to produce.	4.54	VHP	4.32	HP	4.66	VHP
Weighted Mean	4.58	VHP	4.31	HP	4.61	VHP

The table shows the respondents evaluated the produced Blue PACATO Ice cream as very high potential in terms of supply availability with an overall weighted mean of 4.58 and 4.61 respectively to consumers and food expert while for ice cream vendor with an overall weighted mean of 4.31 and interpreted as high potential. This implies that the produced blue PACATO ice cream has potential for marketability in terms of supply availability of the ingredients on the market, that can be also locally available and easy to find in any season.

The table presented the respondents evaluated the produced Blue PACATO ice cream in terms of packaging and labeling interpreted as very high potential with a weighted mean of 4.62 and 4.79 respectively to consumers and food expert. Thus, ice cream vendor with an overall weighted mean of 4.36 and interpreted as high potential. This implies that the produced blue PACATO ice cream in terms of packaging and labeling is visually appealing for the three group of respondents, the brand name is unique as it comes from the name of the main ingredients, has durable packaging and it has originality among other ice cream products, and the label was legible and

easy to understand.

Table 20. *Level of Marketability of the Produced Blue PACATO Ice Cream based on the data average result of 30g, 60g, and 90g proportion in terms Packaging and Labeling*

Indicator The Blue PACATO ice cream...	Consumer		Ice Cream Vendor		Food Expert	
	WM	VI	WM	VI	WM	VI
1. packaging is visually appealing.	4.54	VHP	4.39	HP	4.78	VHP
2. brand name is unique.	4.67	VHP	4.38	HP	4.81	VHP
3. packaging is durable.	4.63	VHP	4.31	HP	4.69	VHP
4. product packaging appears original among other ice cream products	4.73	VHP	4.30	HP	4.64	VHP
5. label is legible and easy to understand.	4.70	VHP	4.33	HP	4.81	VHP
Weighted Mean	4.62	VHP	4.36	HP	4.79	VHP

### Significant Difference among the evaluation of the three groups of respondents on the Level of Marketability of the Produced Blue PACATO Ice Cream

Table 21. *Significant Difference among the Level of Marketability of the Three Groups of Respondents on the Produced Blue PACATO Ice Cream based on the data average result of 30g, 60g, and 90g proportion in terms of Consumer demand*

Criteria	n	OWM	SD	p-value	Decision	Interpretation
Consumer	30	4.49	0.49	0.021	Reject the H <sub>0</sub>	Significant
Ice Cream Vendor	30	4.28	0.42			
Food Expert	30	4.57	0.45			

As shown in the table, the p value is at 0.021, at 5% level of significance and 89 degrees of freedom. The statistical decision is to reject the null hypothesis. Therefore, there is a significant difference among the level of marketability of the three groups of respondents on the produced blue PACATO ice cream in respective on marketability in terms of consumer demand. This means that the three groups of respondents have differently evaluated the level of marketability on the produced Blue PACATO ice cream in terms of consumer demand.

Table 22. *Significant Difference among the Level of Marketability of the Three Groups of Respondents on the Produced Blue PACATO Ice Cream based on the data average result of 30g, 60g, and 90g proportion in terms of Product Cost*

Criteria	n	OWM	SD	p-value	Decision	Interpretation
Consumer	30	4.63	0.39	0.022	Reject the H <sub>0</sub>	Significant
Ice Cream Vendor	30	4.36	0.39			
Food Expert	30	4.46	0.52			

As it shown, the p value is at 0.022, at 5% level of significance and 89 degrees of freedom. The statistical decision is to reject the null hypothesis. Therefore, there is a significant difference among the level of marketability of the three groups of respondents on the produced Blue PACATO ice cream in respective on marketability in terms of Product cost. This means that the three groups of respondents have differently evaluated the level of marketability on the produced Blue PACATO ice cream in terms of product cost.

Table 23. *Significant Difference among the Level of Marketability of the Three Groups of Respondents on the Produced Blue PACATO Ice Cream based on the data average result of 30g, 60g, and 90g proportion in terms of Supply Availability*

Criteria	n	OWM	SD	p-value	Decision	Interpretation
Consumer	30	4.58	0.42	0.004	Reject the H <sub>0</sub>	Significant
Ice Cream Vendor	30	4.31	0.41			
Food Expert	30	4.66	0.37			

As shown in the table, the p value is at 0.004, at 5% level of significance and 89 degrees of freedom. The statistical decision is to reject the null hypothesis. Therefore, there is a significant difference among the level of marketability of the three groups of respondents on the produced Blue PACATO ice cream in terms of supply availability. This means that the three groups of respondents have differently evaluated the level of marketability on the produced Blue PACATO ice cream in terms of supply availability.

As shown in the table, the p value is at 0.000, at 5% level of significance and 89 degrees of freedom. The statistical decision is to reject the null hypothesis. Therefore, there is a significant difference among the level of marketability of the three groups of respondents on the produced blue PACATO ice cream in terms of packaging and labeling.

This means that the three groups of respondents have differently evaluated the level of marketability on the produced blue PACATO ice cream in terms of packaging and labeling.

Table 24. *Significant Difference among the Level of Marketability of the Three Groups of Respondents on the Produced Blue PACATO Ice Cream based on the data average result of 30g, 60g, and 90g proportion in terms of Packaging and Labeling*

Criteria	n	OWM	SD	p-value	Decision	Interpretation
Consumer	30	4.62	0.40	0.000	Reject the H <sub>0</sub>	Significant
Ice Cream Vendor	30	4.36	0.40			
Food Expert	30	4.79	0.27			

### Comments and Suggestions Offered by the Three groups of Respondents

After administering the questionnaires, the three group of respondents provided the following comments and suggestions to further improve the produced Blue PACATO ice cream, these were used to provide relevant and accurate analysis and interpretation in some of the tables in this chapter.

#### Comments:

- The BLUE PACATO ice cream is great to taste, creamy, and delicious, it has a unique, sweet, and fruity flavor. I didn't think that I was eating carrot, tomato, and papaya out of the ice cream. Good job!"
- This product is good for kids and teens, especially those who don't like eating vegetables and fruit. Also, a healthy snack that can be consumed by all ages.
- Ice cream has a good texture similar to the ice cream selling in the market, it's not easy to melt. Overall quality makes it an excellent choice for dessert. Highly recommended.
- The packaging is strikingly modern and reflects current trends, and overall, it is aesthetically pleasing. It's an eye-opener of a newly product innovation that has a new flavor or variant on the market, and the packaging is highly recommendable.

#### Suggestions:

- To make the ice cream more consumer-friendly, it would be beneficial to further enhance its blue hue. Increase the sweetness just a tiny bit. For extra texture in the ice cream, add little pieces of the fruit or vegetable ingredients.
- The label can also be enhanced, particularly the background, to better highlight the product.
- To make the ice cream look more luxurious and like high-quality ice cream on the market, you can also prepare a blue ternate syrup and swirl or add it to it.
- A bit bland, add more cream and a little bit sugar/sweetener, texture is a bit grainy.

### Conclusions

Based on the result of the study, the researcher concluded the following: The Blue PACATO ice cream can be produced thru the preparation of PACATO Jam and mixing ice cream-based ingredients as per procedure. The Physicochemical analysis of the Blue PACATO Ice cream provides Health benefits as manifested by the presence of Protein, Fats, Carbohydrates and Vitamin A. The produced Blue PACATO Ice Cream is a novel product acceptable to the three groups of respondents in terms of its appearance, aroma, taste, and texture. The produced Blue PACATO ice cream is acceptable to have high potential marketability, as determined by the three groups of respondents in terms of consumer demand, product cost, supply availability, and packaging and labeling.

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