

Organoleptic Test of Swivel Matoa (*Pometia pinnata*) Ice Cream

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ABSTRACT

Matoa fruit (*Pometia pinnata*) is a typical Papuan fruit, which has a unique refreshing taste. In addition, the high content of vitamins C and E, can ward off free radicals and increase endurance. In this study, matoa fruit is used as an swivel ice cream flavor enhancer, which is expected to be an alternative utilization of Papua's local food diversity. The method used was making matoa ice cream with the variation of percentage addition for matoa, which are 26%, 34.5% and 48.7%. The results obtained from the ranking test is the asymp value. Sig > 0.05 so it can be concluded that there was no significant difference between the three samples according to the panelists. In the scoring test, it was found that the p value < 0.05 on the taste and aroma parameters (there was a significant difference), but on the color and texture parameters, the p value > 0.05, so it can be concluded that there is no significant difference in the parameters of texture and color.

INTRODUCTION

Ice cream is one of the most consumed types of frozen dairy desserts. Ice cream generally contains 7 categories of ingredients, namely: fat, dry matter without fat, sweeteners, stabilizers, emulsifiers, water and flavorings (Douglas Goff & W. Hartel, 2018). Ice cream has a long history, as it was not discovered directly, but evolved from a hundreds of years old practice involving cooling food and drink using snow, which is described in Roman historical writings in the first century AD (Douglas Goff & W. Hartel, 2018).

In general, the production of ice cream is carried out by mixing the ingredients, preheating, mixing to form an ice cream mixture, homogenizing, pasteurizing, fast cooling, ripening, freezing, packaging and storage (Legassa, 2020). Traditionally making ice cream (also known as swivel ice cream / *es puter*), uses the principle of freezing water using salt (otherwise known as saltpeter) and ice. In the traditional process, the metal container containing the ice cream mixture is placed in a larger container which is placed between the large container and the metal container with ice and a sprinkle of salt, then rotated until the mixture freezes (Septiriyani, 2017).

Indonesia recorded that the growth of the ice cream market for the period 2013 - 2018 increased by 51.9% with ice cream consumption per capita of 0.63% in 2017 (PT Campina Ice Cream Industry, 2018). The increase in consumption of ice cream in Indonesia is due to the tropical climate, population growth at a young age, growing middle class and urban lifestyle (PT Campina Ice Cream Industry, 2018).

Ice cream, with its sweet and refreshing taste, is liked by everyone, especially children. However, many ice cream products circulating in the Indonesian market are high in fat and low in nutrients. Every 100 grams of ice cream contains 210 kcal of energy, 0.1 mg of iron, 4 grams of protein, 12.5 grams of fat and 20.6 grams of carbohydrates (Kurnia Sari & Pramono, 2014). The addition of fruit to ice cream is commonly done as an effort to increase the nutritional value of ice cream, such as dragon fruit (Yuli Fadmawati et al., 2019), papaya fruit (Hadinoto & Loupatty, 2015) and other fruits commonly used as ice cream flavours, such as strawberry, mango and pineapple.

In this study, matoa fruit (*Pometia pinnata*) which is a plant native to Papua is used as an additional ingredient in making ice cream, because the nutritional content of matoa fruit is rich in Vitamins C and E, which are useful for increasing endurance, alleviating stress and maintaining health. skin. The taste of this fruit is very distinctive, like the taste of rambutan mixed with longan and durian flavors (Nuryadi et al., 2019).

Table 1. Nutritional Value of Matoa Fruit per 100 Gram Edible Weight

Energy	90 kkl
Total Fat	0.10 g
Vitamin A	0 mcg
Vitamin B1	0.18 mg
Vitamin B2	0.09 mg
Vitamin B3	0.50 mg
Vitamin C	54 mg
Total Carbohydrates	21.10 g
Protein	1.20 g
Dietary Fiber	0.50 g
Calcium	20 mg
Phosporus	40 mg
Sodium	10 mg
Kalium	190 mg
Copper	300 mcg
Fe	0.60 mg
Zinc	0.60 mg
B-Caroten	2 mcg
Total Caroten	
Water	76.50 g
Ash	1.10 g

The aim of this study was to determine the effect of adding matoa fruit (Pometia Pinnata) to various compositions of rotating ice cream on acceptability through organoleptic tests.

METHODOLOGY

This research is an experimental research which consists of 2 stages, namely: 1. Making Swivel Matoa Ice Cream 2. Organoleptic Test.

At the stage of making ice cream, the formulation used is as follows:

Table 2. Composition of Swivel Matoa Ice Cream

Ingredients	Composition 1		Composition 2		Composition 3	
Matoa fruit flesh	100	gram	150	gram	200	gram
	(26%)		(34,5%)		(48,7%)	
Whipped Cream	75	gram	75	gram	75	gram
UHT Milk	200	ml	200	ml	200	ml
Powdered Skimmed Milk	10	gr	10	gram	10	gram

The tools used in this study included: knives, spatulas, plastic cutting boards, blenders, food scales, large flasks and aluminum containers. The stages of making ice cream are as follows:

1. Sorting matoa fruit with good conditions.
2. Peeling the matoa skin and separating the matoa flesh from the seeds.
3. The chopping of matoa fruit flesh and UHT milk using a blender.
4. Mixing all the ingredients according to the measurements.
5. Put the mixture of ingredients into an aluminum container, then place it in a large thermos container which is half filled with ice cubes and coarse salt.
6. The aluminum container is then rotated continuously until the mixture becomes ice cream with the desired consistency.

Next, is the organoleptic test stage to test the panelists' preferences for various compositions of matoa ice cream that have been made. This test measures the panelists' preference for the taste, aroma, texture and color of the matoa ice cream sample.

The inclusion criteria are as follows:

1. Female / Male aged 18 - 40 years.
2. Do not have allergies to dairy products.
3. Willing to be a panelist.

After obtaining the organoleptic test results, the data is then processed using the SPSS application using the Wilcoxon test and Friedman test.

RESULTS AND DISCUSSION

Ranking Test of Swivel Matoa Ice Cream

The acceptance test is classified as a consumer-oriented test. Acceptance tests are used to determine the level of consumer acceptance of a product. One type of the acceptance test is the Ranking test. In the ranking test, panelists are assigned to sort the samples in order from the least preferred to the most preferred. Panelists are usually not allowed to give the same ranking to two or more samples (Rochmawati, 2019). The ranking test results were then tested with the Wilcoxon test using the SPSS application as shown in the table below.

Table 3. Wilcoxon Test Results Sample

	Sample 34,5% - Sample 26%	Sample 48,7% - Sample 34,5%	Sample 48,7% - Sample 34,5%
Z	-0,979 ^b	-1,066 ^b	-1,733 ^b
Asymp. Sig. (2 - tailed)	0,328	0,286	0,083

a. Wilcoxon Signed Rank Test

b. Based on positive ranks.

From the table above it can be seen that the value of $p > 0.05$. It can be concluded that there was no significant difference in taste between the three samples according to the panelists.

Scoring Test of Swivel Matoa Ice Cream

Sensory testing of a food product has an important purpose, which is related to consumer or panelist acceptance of the product produced (Sirajuddin et al., 2018). The preference test in this study used a scoring test which included the level of preference for texture, taste, aroma and color. The results of this scoring test were then analyzed using the Friedman test (UNIMUS, 2006) with the SPSS application.

The texture of ice cream is related to the fineness and coarseness of the ice crystals and depends on the air, the shape of the crystal arrangement, and the size and distribution of the air cells (Douglas Goff & W. Hartel, 2018). The ideal ice cream texture is smooth and the solid particles are too small to be felt in the mouth. Sandy textures indicate either large crystals of non-uniform size, or too large air cells. The most preferred ice cream product in this study was the sample with the addition of 26% matoa meat which got the highest average score of 4.35 (soft). This can be caused by the more matoa fruit added to the ice cream, the more solids in the sample. However, the results of the Friedman test found that the p value was > 0.05 , so there was no significant difference between the textures of the three ice cream samples.

Table 4. Matoa Ice Cream Scoring Test Value (Texture)

Percentage of Matoa Addition	N	Median (Min - Max)	Mean \pm SD	p^*
26%	34	3,5 (2-5)	4,35 \pm 0,88	0,986 (>
34,5%	34	3,5 (2-5)	4,26 \pm 0,83	0,05)
48,7%	34	3,5 (2-5)	4,29 \pm 0,87	

Taste is a sensation that is formed from the combination of the ingredients and their composition that is captured by the sense of taste. Therefore, the taste of a food product is greatly influenced by the composition of the ingredients for the food formula (Sirajuddin et al., 2018). A product can be accepted by consumers if it has a taste that matches what they like. The matoa fruit itself has a very distinctive taste, with a fresh sweet and sour taste like a combination of rambutan and durian fruit. In this study, the ice cream product that had the highest average preference value was ice cream with a sample code with the addition of 34.5% matoa with an average value of 3.97 (sweet enough), which still maintains the original taste of the matoa but not too sour. From the results of the Friedman test, it was found that the p value for the taste scoring test was < 0.05 , so it was concluded that there was a significant difference between the tastes of the three samples.

Table 5. Matoa Ice Cream Scoring Test Value (Flavor)

Percentage of Matoa Addition	N	Median (Min - Maks)	Mean \pm SD	p*
26%	34	3,5 (2-5)	3,56 \pm 0,660	0,014
34,5%	34	3,5 (2-5)	3,97 \pm 0,627	(<0,05)
48,7%	34	3,5 (2-5)	3,88 \pm 0,808	

*Friedman Test

Testing the aroma or smell is considered important because it can determine whether or not the product is accepted, because the sense of smell is a function of the olfactory safar which is very closely related to the sense of taste which is carried out by the trigeminal nerve, because often these two sensory organs work together (Ruru et al., 2021). The emergence of this aroma or odor is due to volatile substances that evaporate from the product (Fennema, 1996). The aroma of ice cream is not the main quality determinant, but is an important parameter in providing perceptions for consumers. The ice cream product with the most preferred aroma was the sample with the addition of 48.75% matoa fruit with the highest average value of 4.0.

Table 6. Matoa Ice Cream Scoring Test Value (Aroma)

Percentage of Matoa Addition	N	Median (Min - Max)	Mean \pm SD	p*
26%	34	3,5 (2-5)	3,59 \pm 1,076	0,044 (< 0,05)
34,5%	34	3,5 (2-5)	3,71 \pm 0,799	
48,7%	34	3,5 (2-5)	4,00 \pm 0,921	

*Friedman's test

Color is the most important factor that determines the attractiveness of a food product. Color is a very important quality attribute, because even if a product has high nutritional value, tastes good, has an attractive texture and aroma, if the appearance of the product is not attractive, it will cause the product to be less attractive (Fennema, 1996).

Color is one of the visual profiles that is the first impression consumers have in assessing food ingredients. Food preferences include two main aspects, namely the appearance of food when it is served (portion size, color, shape) and the taste of food (which is influenced by aroma, seasoning, doneness and texture). These two aspects are equally important to note in order to produce food that consumers like (Naibaho et al., 2019). The preferred ice cream product was the sample with the addition of 48.37% matoa fruit with the highest average value of 3.94.

However, in the Friedman test results, it was found that the p value was > 0.05 , so it can be concluded that there was no significant difference between the colors of the three types of samples.

Table 7. Matoa Ice Cream Scoring Test Value (Color)

Percentage of Matoa Addition	N	Median (Min - Max)	Mean ± SD	p*
26%	34	3,5 (2-5)	3,79±0,978	0,232 (>
34,5%	34	3,5 (2-5)	3,88±0,946	0,05)
48,7%	34	3,5 (2-5)	3.94±0,952	

*Friedman's test

CONCLUSIONS AND RECOMMENDATIONS

Organoleptic tests have been carried out on all three samples of swivel Matoa ice cream. In the ranking test, there was no difference in preference for the three ice cream samples. In the scoring test, there was no significant differences in the color and texture parameters in three samples. However, in terms of taste and aroma parameters, there were differences between the three samples. The taste parameter that the panellists liked the most was the addition of 34.5% matoa with an average value of 3.97, and for the aroma parameter, the panellists liked the most was the sample with the addition of 48.75% matoa with an average value of 4.00.

FURTHER STUDY

The authors realize that this research still has limitations. Therefore, based on this conclusions that have been obtained, the further study can be done to improve this study, such as using different methods to produce ice cream and using a larger panellists to conduct a more comprehensive organoleptic tests.

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