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Analysis of consumer preferences belimbing sorbet dessert in the city of banda aceh Indonesia

Zuraini M[1], Indani[1], Yuli Heirina Hamid[1], Laili Suhairi[1*], Yuri Gagarin[2]
[1] Family Welfare Education (PKK) Study Program, Faculty of Teacher Training and Education, Syiah Kuala University, Darussalam, Banda Aceh, Indonesia
[2] Research Center for Elephant Conservation and Biodiversity Forest, Syiah Kuala University, Darussalam, Banda Aceh, Indonesia

Abstract
Starfruit is very often found in the Aceh region. You can find starfruit in almost every shop. People generally process starfruit into vegetables or additional ingredients in cooking. So, there is a need to add a variety of contemporary foods, one of which is dessert or dessert dishes. This research aims to determine the standard recipe for making Starfruit Sorbet Dessert and determine the level of consumer acceptance. The approach used in research is a quantitative approach with experimental methods. This research carried out 3 treatments with 3 repetitions. The data collection technique used was an observation test (Sensory Evaluation) carried out by 4 trained resource persons/panelists, namely Culinary Lecturers at the PKK FKIP USK Study Program. Next was the preference test which was carried out by 30 consumer panelists, namely USK FKIP students. The data analysis technique uses LSD (Least Significant Different) with a significance level of 0.05. Based on the results of data analysis by the resource person, treatment II (using 50% starfruit) received the highest assessment and was preferred in terms of strong bright color, fragrant aroma, slightly soft texture and not too sweet taste. From the results of the preference test by consumer panelists, treatment III (with the use of 75% starfruit) received the highest rating and was preferred in terms of bright, rather strong color, fragrant aroma, soft texture and sweet taste. Thus, the alternative hypothesis is accepted (H1). It is hoped that people can use starfruit to make a more varied contemporary food.

Keywords: Starfruit sorbet dessert, organoleptic test, starfruit

Introduction

Desserts, or what are usually referred to as sweet dishes, are dishes that are generally enjoyed after the main course. Desserts generally have a sweet taste and are served cold or hot. The role of dessert in the arrangement of dishes is as a refreshment after consuming the main dish which sometimes has a strong aroma or taste, thereby helping to relieve or eliminate the taste [1].

However, there have been quite big changes in desserts, which were originally served after dinner, can now be enjoyed throughout the day from breakfast, lunch, to snacks. Nowadays, desserts not only play an additional role in restaurants or cafes, but many restaurants make them the main focus. One type of dessert that is very popular in tropical climates is Sorbet [2].

In general, this frozen dish does not rely on the use of milk as its main component. Milk is used in frozen dishes to improve the texture of ice cream. Because it does not rely on milk as a main component, sorbet has a coarser texture. The texture of sorbet tends to be rougher than ice cream because it does not contain an emulsifier [3]. Usually, sorbet relies on fruit as its main ingredient. However, in this study, researchers used star fruit as a potential ingredient that is very suitable to be used as a basic food ingredient in Aceh. In this research, the variation of starfruit used was starfruit wuluh.

Starfruit comes from the Oxalidaceae family, genus Averrhoa. Starfruit can be divided into two main types, namely sweet starfruit (*Averrhoa carambola*) and sour starfruit (*Averrhoa bilimbi*), which is better known as wuluh starfruit [4]. Starfruit (*Averrhoa bilimbi*) is also often referred to as vegetable starfruit by the general public, and is one of the ingredients used as a complement in several dishes [5].

One of the advantages of starfruit is its very easy availability and also its ability to be consumed safely, as well as having the potential to lower blood pressure [6]. Starfruit contains potassium citrate and also contains vitamin C. However, the high water content of this fruit causes it to easily spoil and has a limited shelf life, only around 4-5 days [7]. Indonesia is a tropical country that has a good climate and fertile soil, this can be proven by the abundance of plant species that grow in Indonesia [8, 9]. Various kinds of plants can grow on Indonesian soil, including highly nutritious plants, one of which is star fruit.

Star fruit has the advantage of its distinctive taste and also contains quite beneficial nutrients [10]. Star fruit is often called a refreshing fruit because of its high water content, reaching 90 grams per 100 grams of fruit. Apart from that, other significant nutrients in star fruit are calories, vitamin A, and vitamin C. Judging from the nutritional composition of star fruit, it appears that this fruit has a low fat content (0.2 g), which is accompanied by the presence of protein (0.7 g) and carbohydrates (4.7 g), making it suitable for use as a base for sorbet drinks. The choice of star fruit in making sorbet is in accordance with the criteria for sorbet which generally has a low fat content, so it can be an alternative for those who are on a diet program [11].

Star fruit is special because it can be harvested all year round without knowing the season, and can even be harvested 3-4 times a year [12]. One way to process starfruit is to turn it into sorbet. Starfruit sorbet is produced from starfruit which has a sour and fresh taste, and has a watery texture. Starfruit Sorbet is a dessert variant modified from

fruit sorbet which is generally popular among the public, often using sour fruits such as strawberries [13].

In surrounding communities, starfruit is more often processed into types of vegetables or local dishes such as wuluh starfruit shrimp chili sauce (Aceh Indonesia: *Asam Udeung*), wuluh starfruit chili sauce (Aceh Indonesia: cicah sabe), wuluh starfruit sour vegetable, wuluh starfruit anchovy sauce, wuluh starfruit fish paste, and various other dishes [14]. However, the type of food in the form of sorbet dessert in Aceh, especially in Banda Aceh, still has limitations in sales and variety. Seeing this background, the researcher was interested in conducting research on Consumer Preference Analysis of Starfruit Sorbet Dessert in the City of Banda Aceh, Indonesia.

Material and methods

This research is classified as a quantitative approach with an experimental type of research [15]. Experimental research methods are included in the category of quantitative research methods. Experiments involve efforts to test, search for, and confirm a hypothesis [16]. The essence of experimental research lies in studying causal or cause-effect relationships [17]. A causal relationship refers to a relationship where a change in the independent variable will cause a change in the dependent variable. In other words, when the value of the independent variable is changed, it will have an impact on changing the value of the dependent variable.

Observation Test (Hedonic Scale)

Observation tests on standard recipes were tested on 4 resource persons who had knowledge and skills, namely culinary arts lecturers. Each resource panelist was given 3 samples of the Starfruit Sorbet dessert by providing a score card and code number for each treatment, the code is only known to the researcher. In this assessment, an assessment tool is used, namely the Sensory Evaluation Card [18].

Preference Test

The acceptance test for each treatment was tested on consumer panelists consisting of 30 people and 3 samples were presented by providing code numbers. In this research, a preference test card (Preference Test) was used. In the form of a value on a scale of 1-7 to see whether you like it or not, which shows whether it is accepted or not. The liking level test uses the Hedonic Scale which consists of 7 level scales [19].

Table 1: *Hedonic Scale* [18, 19]

No	Acceptance Test	Score
1.	Very strong	7
2.	Strong	6
3.	Rather Strong	5
4.	Neutral	4
5.	Somewhat Weak	3
6.	Weak	2
7.	Very weak	1

The product specifications expected through this research are:

1. The color of the resulting dessert is bright yellow slightly greenish.
2. The resulting dessert smells delicious.
3. The texture of the resulting dessert, namely watery and rough.
4. The taste produced from the dessert sour and gives a fresh effect

The proposed hypothesis was tested using one-way analysis of variance, followed by LSD (Least Significant Different) with a significance level of 0.05. In this research, a one-way analysis of variance was carried out to see the preference of the Starfruit Sorbet dessert for color, aroma, texture and taste.

Results and discussion

Result

Based on the results of variance analysis, it shows that:

1. Color, Aroma, and Taste

Based on the results of the analysis of variance, it seems that there are no significant differences in color, aroma and taste in repetition I related to variations in the number of star fruit. This means that changing the amount of starfruit did not have a significant effect on the color, aroma and taste characteristics in the experiment.

2. Texture

On the other hand, the analysis results showed that there was a significant difference in terms of texture in repetition I when the number of star fruit was changed. This means that variations in the amount of starfruit have a real influence on the texture of the product or ingredient being tested. The average value of the LSD test results for texture can be seen in Table 2.

Table 2: Ratings & Reviews of Texture Due to Starfruit Treatment in Starfruit Sorbet Dessert [20]

Treatment amount of Starfruit (%)	Average
25	4,5 a
50	4,0 a
75	5,8 b
LSD 0,05 = 0,7	

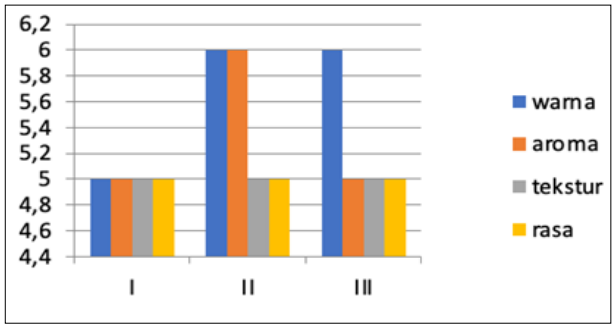
The results of the analysis of variance showed that variations in the number of starfruit did not have a significant effect on color, aroma, texture and taste in repetition II. In other words, changes in the number of star fruit did not have a real impact on these characteristics. Therefore, there is no need to carry out further tests using the Least Significant Difference (LSD) method with a significance level of 0.05.

In repetition III, the results of the analysis of variance showed that variations in the number of starfruit did not have a significant effect on color, taste and texture. However, there is a significant influence on aroma. This means that changes in the amount of starfruit significantly affect the aroma characteristics of the product or ingredient being tested in repetition III. The average value of the LSD test results for aroma can be seen in Table 3.

Table 3: Ratings & Reviews of Aroma Due to Starfruit Treatment in Starfruit Sorbet Belimbing [20]

Treatment number of star fruit (%)	Average
25	4,3 a
50	5,0 a
75	6,3 b
LSD 0,05 = 1,2	

Resource Panelists' Acceptance of Starfruit Sorbet Dessert (Sensory Evaluation)



Graph 1: Average Descriptive Test Results by Interviewees on Moschata Toffee Dessert [21]

Information
I = Starfruit Sorbet Dessert using 25% Starfruit (30g)
II = Starfruit Sorbet Dessert using 50% Starfruit (50g)
III = Starfruit Sorbet Dessert using 75% Starfruit (100g)

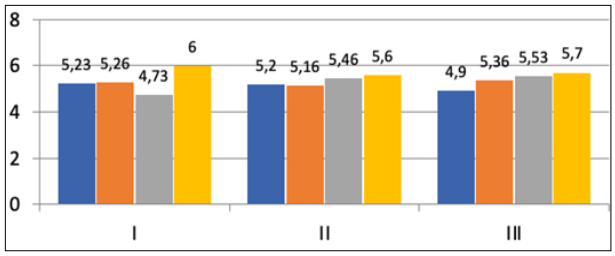
Based on the research results in Graph 1 above, it shows that:

1. Treatment II (50%)
Starfruit Sorbet Dessert with the use of 50% starfruit (50 gr) was most widely accepted by the interviewees. This dessert has an average organoleptic value of 5.5. This shows that the interviewees tend to give a positive assessment of the organoleptic characteristics of the Starfruit Sorbet dessert with the use of 50% starfruit.

2. Treatment I (25%)
Starfruit Sorbet Dessert with the use of 25% starfruit received a lower assessment than treatment II. Even though no average value is mentioned, from the statement that treatment II has the highest average value, it can be interpreted that treatment I has an average value that is lower than 5.5.

3. Treatment III (75%)
Starfruit Sorbet Dessert with the use of 75% starfruit also received a lower assessment than treatment II. Although no average value is mentioned, from the statement that treatment II has the highest average value, it can be interpreted that treatment III has an average value lower than 5.5.
Apart from that, the organoleptic characteristics that further support the acceptance of the Starfruit Sorbet dessert in treatment II are strong bright color, fragrant aroma, slightly soft texture, and a taste that is not too sweet.

Consumer Acceptance of Starfruit Sorbet Dessert (Likeability Test)



Graph 2. Average Consumer Assessment of the Organoleptic characteristics (color, aroma, texture and taste) of Moschata Toffee Dessert [22]

Information
I = Starfruit Sorbet Dessert using 25% starfruit (30g)
II = Starfruit Sorbet Dessert using 50% starfruit (50g)
III = Starfruit Sorbet Dessert using 75% starfruit (100g)

In Graph 4.10 below, it can be concluded that the results of the consumer preference level test illustrate the comparison of the preference results for the Starfruit Sorbet dessert with the following details:

Treatment I (25% starfruit, Code MT11)
Average color: 5.23
Average scent: 5.26
Average texture: 4.73
Average taste: 6

Treatment II (50% yellow starfruit, Code MT55)
Average color: 5.2
Average scent: 5.16
Average texture: 5.46
Average taste: 5.6

Treatment III (75% starfruit)
Average color: 4.9
Average scent: 5.36
Average texture: 5.53
Average taste: 5.7

From this comparison, it can be seen how the sources or consumers provide an assessment of the organoleptic characteristics (color, aroma, texture and taste) of the three variations of the Starfruit Sorbet dessert which contain different proportions of Starfruit.

Discussion
The results of the descriptive test by 4 resource panelists showed that:

1. Treatment II (Code MT55)
In the descriptive test by 4 panelists, the Starfruit Sorbet dessert in treatment II received the highest score with an average of 5.5 on a scale of 1-7. From the results of the preference level test for organoleptic characteristics by 30 consumer panelists, treatment II had the highest average value in terms of texture, namely 5.53.

2. Treatment I (Code MT11)
In a liking level test by 30 consumer panelists, treatment I was preferred in terms of color (value 5.23) and taste (value 6).

3. Treatment III
In a preference level test by 30 consumer panelists, treatment III was preferred in terms of aroma (value 5.36).
In the consumer acceptance test, treatment III had the highest average value, namely 5.37.

From this information, it can be concluded that treatment II (Code MT55) received the highest rating in the descriptive test by the interviewee, and also had the highest score in terms of texture according to the consumer preference test. However, consumer preferences varied more in treatments I and III in terms of color, aroma and taste. Overall, treatment III received the highest average score in the consumer acceptance test.

Proving Hypothesis

The hypothesis proposed in this research is "There is an influence of differences in the level of consumer liking (preference) on the organoleptic characteristics (color, aroma, texture and taste) of the Starfruit Sorbet dessert"

The results of the analysis prove that the hypothesis is accepted because there are differences in consumer preferences regarding the characteristics of Starfruit Sorbet Dessert. This research is acceptable, namely that there are differences in consumer preferences for the color, aroma, texture and taste of the Starfruit Sorbet dessert. So it can be concluded that the research hypothesis is acceptable (Ha is accepted).

Conclusion

Based on the results of the research and data analysis carried out for this research, a significant difference was obtained between the resource panelists. The results of the LSD test of 0.05 on the resource panelists showed that there was a real difference in the texture in repetition I. There was a real difference in the aroma in repetition III due to treatment. number of starfruit. Starfruit Sorbet Dessert Received by the Interviewee: Based on the characteristics of color, aroma, texture and taste, the Starfruit Sorbet dessert received by the interviewee was treatment II, where starfruit was used as much as 50%. Acceptability of Consumer Panelists: Based on the characteristics of color, aroma, texture and taste, the acceptability of consumer panelists showed that the Starfruit Sorbet dessert received was treatment III, where the use of starfruit was 75%.

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