

Analysis of the Addition of Apple and Mango Flavorings on Functional Breadfruit Leaf Beverages

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Abstract. This study aims to 1. Understand how to make breadfruit leaves beverages with apple and mango flavoring 2. Determine whether using breadfruit leaves with apple and mango flavorings are favorable to consumers. This study uses a two-way ANOVA to determine the level of organoleptic significance, namely the hedonic test and hedonic quality, while for the consumer test, researchers used the Friedman test to determine the level of consumers to the breadfruit leaf beverage product with the addition of flavor. Results of organoleptic tests are as follows; breadfruit leaves beverages with the addition of apple flavor by 5% has the highest yield for hedonic tests with an average value of 43.1 and for mango flavorings the highest value for mango flavoring is 7% with a value of 43.4. After conducting a consumer test using the Friedman Test, it can be obtained that the breadfruit leaf beverage with the addition of mango flavoring by 7% has a high average of navigation level compared to the other 16.5.

1. Introduction

Nowadays, numerous processed products are using natural and health-based ingredients. This trend has become global and has become one of the new breakthroughs for food and beverages entrepreneurs to produce food and herbal drinks which, besides favors, also have benefits for the health of the consumers. Ranging from wet to dry processed foods and from home industry products to multi-international scale companies competing to serve food and herbal drinks that are beneficial to the human body. In fact, Indonesia is one of the most biodiverse country, most of which medicines for all kinds of diseases are easily found, one of which is the leaves of breadfruit trees.

Breadfruit has the full name *Artocarpus altilis* and has properties to cure liver, kidney, high cholesterol, reduce heart disease, ward off cancer, gout, diabetes, allergies, enlarged spleen, toothache, and anti-bleeding [1].

Breadfruit trees are often found in tropical climates countries, such as Indonesia. Broadly speaking, food flavorings are divided into natural flavorings and synthetic flavorings. Natural flavoring is obtained from the extraction of natural ingredients while synthetic flavors are produced from synthetic (chemical) materials. With the taste of the drink also, it is expected that the breadfruit leaves drink will be a functional drink that is, not only delicious but also full of flavor images. the many benefits and benefits that we can get from Sukun leaves, as well as the ease in obtaining raw materials, the authors hope to do research on the production of breadfruit leaf drinks in packaging with additional fruit flavorings that can be a useful and high-efficacy applied technology.

[2] in his study entitled Analysis of Potassium and the Percentage of Solubility of Calcium Oxalate by Potassium in Breadfruit Leaf Tea (*Artocarpus altilis*) states that breadfruit is included in the genus *Artocarpus* (Family Moraceae) which consists of 50 woody plant species. Breadfruit leaves contain several nutritious substances such as hydroxyic acid, acetylcolin, potassium, tannins, riboflavin, and so on.

[1] in a pharmaceutical journal entitled Formulation of Breadfruit Leaf Extract (*Artocarpus altilis* (Parkins.) Foseber) with Gel Base as Anti-Inflammatory. This research was carried out by making breadfruit leaf extract (*Artocarpus altilis*) as an anti-inflammatory gel formulation using variations in

extract concentrations of 4%, 6%, 8%, 12%, and 16%. This study aims for a stable gel formula that is effective and safe in its use as an anti-inflammatory gel preparation. Thesis study of [3] entitled Extra Acute Toxicity Test of Ethanol of Breadfruit Leaves (*Artocarpus altilis*) Against *Artemia salina* Leach Larvae with Brine Shrimp Lethality Test (BST) Method which showed that breadfruit leaves (*Artocarpus altilis*) is one of the traditional medicines known to the Indonesian people.

2. Method

2.1. Research Procedures

This research was carried out in several stages. These stages include, (1) Making breadfruit leaf drinks, (2) Formulation of breadfruit leaves with the addition of apple and mango flavoring (3) Organoleptic test of breadfruit leaves to determine the selected formula from breadfruit leaves with the addition of apples and mangoes in determine based on the level of panelist preference, (4) Test the selected product consumers from the formula for breadfruit leaf drinks to the community.

2.2. Research Design

2.2.1. Organoleptic Test

Organoleptic tests performed on breadfruit leaf drinks using hedonic tests and hedonic quality tests. Organoleptic testing is carried out on the water of steamed breadfruit tea. The hedonic test is a test to find out the panelist's response to the liking or dislike of breadfruit leaf beverage products, while the hedonic quality test is a test to find out the panelist's response based on the good or bad impression on the breadfruit tea product [4].

The hedonic test and hedonic quality of breadfruit leaf beverage products were carried out using semi-trained panelists as many as 30 people who were often involved in thesis research for organoleptic testing. The panelists involved had fulfilled a number of inclusion criteria such as likes to consume flavored drinks, liked sweet and mango apples, and were healthy and given a briefing on breadfruit leaf drinks and the attributes to be tested. In the hedonic test the panelists were asked for their response to color, clarity, aroma of breadfruit leaves, fruit aroma, pungency, and foreign flavor.

Assessment of product quality is carried out through hedonic quality tests. Attributes used are color, clarity, aroma of breadfruit leaves, aroma of apples and mangoes, pungency, and foreign flavor. The selection of selected products from the breadfruit leaves beverage with the addition of apple flavoring and breadfruit leaf drink with the addition of mango flavorings was determined based on the hedonic test, namely by making the proportion of the assessment for the overall aspect. Determination of this proportion is a consideration from researchers Research Location

The research was conducted at Pasar Tanjung, Pasar Kepatihan and Pasar Gebang, Kabupaten Jember. Determination of the location of the research was carried out on the basis of considerations namely:

2.2.2. Consumer Test

Consumer tests were conducted on selected breadfruit leaf beverage products with 50 panelists [4] in [5]. Panelists were selected using age-based criteria based consumers who are suitable for testing breadfruit leaf drinks are in the age range of 20-35 years. This is because at that age the population tends to be more and in this age range a habit begins to form and loyalty to a product. Panelists are asked to provide an assessment of the color of the steeping, aroma and taste. The scale used is 1 = Very very dislike, 2 = very dislike, 3 = dislike, 4 = somewhat dislike, 5 = dislike, 6 = rather like, 7 = likes, 8 = very like, 9 = really like it.

2.3. Data Analysis Methods

Data analysis was conducted with an oriented data on the average results of organoleptic tests, chemical properties analysis, and consumer tests tabulated and analyzed. The results of the research data were processed with Microsoft Excel 2010 and then analyzed statistically using SPSS Version 16 for Windows. Hedonic test data and hedonic quality of breadfruit leaf drinks were analyzed by two-way variance analysis (two-way ANOVA) ANOVA test was used to determine the effect of flavor differences on each concentration on hedonic and hedonic quality of the product. Consumer test data were analyzed by Friedman test which was then followed by Duncan's Multiple Range Test. Furthermore, consumer acceptance data were analyzed descriptively to determine the level of consumer acceptance of each beverage product from breadfruit leaves with apple flavoring and mango flavoring.

3. Result and Discussion

From the organoleptic test, the hedonic test and hedonic quality obtained on the addition of apple flavoring to the color aspect had the highest preference value on the addition of apple flavoring by 7%, namely 7.3 followed by the addition of flavoring by 5%, which was 6.7 and finally the addition of flavor apples by 10% 6.6 and for the organoleptic test the biggest value is 8.1 on the addition of 5% apple flavoring followed by the addition of apple flavorings 7% and 10%, respectively 7.9 and 7.6, this is due to panelists the color of the breadfruit leaves drink with the apple flavoring is preferred by the panelists. The second hedonic test is the clarity test in which the value of the hedonic test on the addition of apple flavoring is 5% at 7.2 and for the hedonic quality test has a value of 7.7. This is caused by the addition of apple flavoring to the breadfruit leaf tea which was initially rather dark, a little brighter and clearer. Furthermore, breadfruit leaves aroma test wherein in this aspect the panelists were asked for their responses regarding whether there is still the aroma of breadfruit leaves in the breadfruit leaf drink that has been given apple flavoring, the results of hedonic and hedonic quality test stated that the average value of breadfruit leaves in the hedonic test was 7, 6 while the hedonic quality test was 7.7 which indicated that the panelists liked the aroma of breadfruit leaves and the hedonic quality test stated that the panelists still felt the aroma of the breadfruit leaves which was still strong. Fruit scent test which in this aspect is apple can get the average results of panelists' values in the hedonic test of 7.4 and in the hedonic quality test of 6.2. The panelists assessed that the aroma of apples on the addition of apple flavoring by 5% had a panelist's favorite aroma, but the hedonic quality test aspect had a decrease in numbers because the aroma of apples at a concentration of 5% was still not too strong.

Pungency aspect (bitter taste) is a test to find out whether there is a bitterness caused by breadfruit leaves in breadfruit leaves drinks with the addition of apples, from the results of the data processing it can be found that the panelists prefer the bitter taste on the addition of apple flavoring by 7% which is the average 7.7 which indicates the panelists like the bitter taste (Pungency) in the breadfruit leaf drink this value is not far from the addition of apples by 10% which is 7.6 and rather dislikes the bitter taste at the addition of apples by 5% with a value of 6.8. This is because the less apple flavor is added, the bitter taste of breadfruit leaves is felt. This is similar to the hedonic quality test with the strongest bitter taste value in the addition of 5% apples which is 7.3 while the lowest bitter taste is found in the addition of apple flavoring of 6.5. The last organoleptic aspect is foreign taste, where the highest value of taste of panelists is the addition of a mop by 5% and the foreign flavor which is at least the level of pleasure is the addition of apples by 10%. Even in the hedonic quality test, the value of foreign flavor strength can be obtained at the addition of apple flavor by 10%, which shows that the addition of too much flavoring to the addition of apple flavor is not preferred by the panelists.

In the organoleptic test with the addition of manga fruit, it was obtained for the color results, the highest value of panelists' preference was obtained by breadfruit leaves with 7% mango flavoring, namely

7.3 and the smallest value was obtained by the addition of 10% mango flavoring, which was 6.8, while the quality test hedonic can get the highest brightness level of breadfruit leaves on the addition of mango flavoring by 7%, this is because the addition of too much mango flavoring will cause the color level will also darken. In the clarity aspect of the hedonic test, the concentration which has the highest level of preference is the breadfruit drink with the addition of mango flavoring by 10% which shows that the higher the concentration level of manga flavor the higher the level of panelist preference, it is caused by the breadfruit leaf drink given the mango flavor the more concentration it gives, the more clearly it will look. As for the value of the hedonic quality test, the panelists chose the manga concentration of 7% and 10% as the clear value of 7.1. While the breadfruit leaf drink with the addition of mango flavoring is 5%, has a value of 6.0, which means it is rather clear.

The next aspect is the aroma aspect of breadfruit leaves, where in the hedonic test the value of the panelist's preference level on the aroma of breadfruit leaves is 7.1 at a concentration level of 5%, and the lowest at a concentration level of 10% is 6.6 which indicates that the panelists rather like the aroma of breadfruit leaves found in the 10% mango flavor in breadfruit leaves. This is caused because the aroma of breadfruit leaves fades and is very liked by the panelists. Furthermore, for the hedonic quality test of breadfruit leaves aroma with the largest panelist measurement value is at the concentration level of 5%, that is 6.8 and the lowest value is 6.0 at the addition of mango concentration of 10% which shows the panelists feel the aroma of breadfruit leaves is rather strong on leaf drinks breadfruit with the addition of mango flavoring. The fragrance of fruit on the hedonic test had an average panelist preference with the highest value of 7%, which was 7.8 which showed that the addition of 7% mango flavor was preferably higher than the breadfruit leaves drink with the addition of other mango flavorings. In the hedonic quality test the highest fruit aroma is obtained at an addition rate of 10%, which is 7.2, which means that the flavor of the mango flavor is strong, while the lowest value is at 5% concentration of 5.9 which indicates normal.

In the next aspect, pungency, in which the highest value on the hedonic test can be obtained with the addition of mango flavoring of 10% at 7.6, this indicates that the higher the level of addition of mango flavor, the bitter taste is increasingly favored by the panelists. hedonic, the highest value is the addition of mango flavoring by 10% with a value of 7.5 which indicates that the addition of mango flavoring is 10% higher pungency. The last one is the organoleptic aspect in the form of foreign flavor where the highest value of panelist's preference is found in the breadfruit leaf drink with the addition of 5% mango flavoring which is 7.9 which shows the panelists like the foreign flavor found in the breadfruit leaves beverage with the addition of 5% mango flavor. this is supported by the value of the hedonic quality test where the strongest foreign flavor is found in the breadfruit leaf drink with the addition of 10% mango flavor with a value of 8.3 which means very strong.

The next test is normality test, before we do two ANOVA tests wa, y, we have to test for normality, to find out whether the data managed is normally distributed or not. From the results of the normality test (attachment 2), the results of all data were distributed normally (0.05 significance value) on the two way Anova test obtained significance value of 0.096 for the organoleptic aspect and 0.144 for flavoring, this indicates that the data is significant with fsig value. 0.05. Furthermore, if the data has been significant, then the best one is taken in each flavor, namely apple flavoring and mango flavoring for further testing by a correspondent of 50 people with an average age of 21-35 years to judge which taste is the best from breadfruit leaves drinks. original, breadfruit leaves drink with the addition of apple flavoring and breadfruit leaf drink with the addition of mango flavoring. In drinks and breadfruit with the addition of apple flavoring at a concentration level of 5%, and on the flavor of mango by 7%.

In the consumer test, the data was managed using SPSS using Friedman test, where the assessed aspects were color, aroma and taste. From the friedman test results that have been done to eat in the highest yield value of consumer preference is the beverage of breadfruit leaves with mango flavoring

enhancer with a color value of, 4.71, aroma of 6.06 and a taste of 5.73. In the test statistic table shows that the value of Chi Square = 46.682 and asymp sig. 0,000. Chi Square significance test results show that sig. <0.05 so it can be concluded that three drinks of breadfruit leaves have a significant difference.

4. Conclusion

Based on the description and discussion that has been done, it can be concluded that, (1) the breadfruit leaves drink with the addition of the best apple flavoring based on the results of the test are breadfruit leaves with the addition of apples by 5%, (2) drinks of breadfruit leaves with the addition of mango flavored based on the test results were drinks of breadfruit leaves with the addition of mango flavoring by 7%, (3) the level of community acceptance in consumer tests conducted on three samples, namely the original breadfruit leaf drink, breadfruit leaves drink with mango flavoring and the addition of apple flavoring. Breadfruit leaves with the best addition of mango flavoring.

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