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Comparative Analysis of the Quality of Pandan Glutinous Rice Talam Cake and Talam Cake With Dragon Fruit Peel Extract (*Hylocereus Polyrhizus*)

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Abstract: Indonesia's traditional wet cake industry, such as glutinous rice cakes, layer cakes, and putu cakes, still use many synthetic dyes that are risky to health. Natural dyes are a safer alternative, because many are obtained from plants or food waste, such as pandan leaves, sugi leaves, and dragon fruit peels. The skin of the red dragon fruit (*Hylocereus polyrhizus*) has the potential to be an alternative to natural dyes because it contains high betacyanin which is antioxidant while providing an attractive purplish red color. This study aims to analyze the comparison of the sensory quality of pandan sticky rice talam cake (control) with glutinous rice talam cake with 50 ml of red dragon fruit peel extract. The research method used was a quantitative experiment with a comparative test approach (Independent Samples t-test), involving a rating test and a hedonic test conducted by 30 panelists, and analyzed by comparing the values of $|t_{\text{calc}}|$ against the table at a significance level of 5% ($t_{\text{table}} = 2.00172$). The results showed that the addition of dragon fruit peel extract had a significant effect on the quality of color (count 42.115 > table 2.00172) and aroma (count 8.494 > table 2.00172) organoleptically, as well as on the level of color, texture, and taste preference (counts 5.220; 2.383; and 2.208 > table 2.00172), but did not have a significant effect on the organoleptic quality of shape, texture, and taste or the level of shape preference. The overall best treatment was sticky rice talam cake with dragon fruit peel extract (X1), although the panelists preferred the aroma of pandan sticky rice cake without extract (X0). This study proves that red dragon fruit peel extract can be used as a natural dye while improving the sensory quality of glutinous rice talam cake. Further research is recommended to examine the shelf life, antioxidant content, and nutritional value of the product.

Keywords: Dragon Fruit Peel, Sticky Rice Talam Cake, Quality Comparison, Natural Dyes, Organoleptic Test

INTRODUCTION

Glutinous rice talam cake is one of the traditional wet cakes of the archipelago that has a soft, fluffy, and slightly sticky texture due to the high amylopectin content in glutinous rice, as well as the savory taste of coconut milk which is its characteristic (Sari et al., 2020). The high consumption of wet cakes in Indonesia, reaching 1.5 servings per capita per week or equivalent to 78.3 servings per capita per year based on SUSENAS 2025 data, is about 3.7 times higher than pastries, showing the large market potential and opportunities for the development of traditional cake products such as glutinous rice talam cakes (Central Statistics Agency, 2025). However, the high moisture content due to the use of coconut milk causes glutinous rice cakes to have a relatively short shelf life, so this product should be consumed immediately after manufacture so that its sensory quality is maintained (Wulandari et al., 2017). In addition to shelf life, the aspect of display, especially color, is also an important factor that determines the quality and attractiveness of glutinous rice cakes, considering that color is an indicator of quality that consumers first assess before assessing other sensory attributes.

Although glutinous rice talam cake has a distinctive taste and is loved by the public, this product generally still appears simple with less attractive colors, while color is the first sensory attribute that consumers assess and helps determine the acceptance of a food product. This condition is a challenge in the development of traditional cakes to remain in demand, especially by the younger generation who tend to be more interested in products with attractive appearances and high functional value (Setyaningsih et al., 2010). Therefore, natural dye innovations are needed that are able to increase the visual appeal of glutinous rice talam cakes without losing their original characteristics, as well as being a safer alternative to synthetic dyes (Analianasari et al., 2016). One of the alternatives that has begun to be studied is the use of agricultural waste as a source of natural pigments, considering its abundant availability but has not been utilized optimally.

Red dragon fruit peel is one of the food waste commodities that has great potential as a source of this natural dyes. The weight of the skin of the red dragon fruit reaches 30-35% of the total weight of the fruit, but this part is still rarely used and generally only becomes waste (Faridah et al., 2014). In fact, the skin of red dragon fruit contains betalain compounds that play a role in providing a natural purplish red color as well as being antioxidant and antimicrobial, even higher in potential than the pulp (Faridah et al., 2015). The cultivation of dragon fruit, which continues to increase in various regions, including West Sumatra, has also increased the volume of skin waste, so that its use as a natural dye in food products such as glutinous rice talam cakes while supporting the concept of *zero waste utilization* in food processing (Tripathi et al., 2024; Fertiasari et al., 2019). Several previous studies have proven the effectiveness of dragon fruit peel extract as a natural dye in food products such as soy milk and coconut milk (Ekawati et al., 2015) and cendol (Hasanah et al., 2022), but the comparison of its quality with conventional natural dyes such as pandan leaves in glutinous rice-based glutinous rice talam cakes has not been studied. This gap underlies the need for further studies on the use of red dragon fruit peel extract as a natural dye in glutinous rice talam cakes.

The assessment of the quality of glutinous rice talam cakes in this study included five organoleptic parameters, namely shape, color, aroma, texture, and taste, as well as the level of acceptability of the panelists. Based on the pre-research that has been carried out, the addition of 50 ml of red dragon fruit peel extract to glutinous rice talam cake produces a light pink color that is quite attractive, thus indicating the potential of this extract as a substitute for pandan leaves as a natural color. Based on the description above, the researcher conducted a study on the comparison of the quality of pandan sticky rice cake with dragon fruit peel extract glutinous rice cake, so this study aims to analyze the effect of the comparative use of red dragon fruit peel extract on the quality of shape, color, aroma, texture, and taste of glutinous rice cake compared to the use of pandan leaves as a control.

RESEARCH MATERIALS AND METHODS

Research Types and Design

This research is a quantitative experimental research, which is a study that aims to determine the influence of certain treatments on the object being studied with data in the form of statistically analyzed numbers (Sugiyono et al., 2016). The research design used was a two-group design, namely glutinous rice talam cake with the use of pandan leaves as a control (X0) and glutinous rice talam cake with the addition of 50 ml of red dragon fruit peel extract as a treatment (X1). Data from organoleptic tests and hedonic tests were analyzed using Independent Samples t-test to determine whether there was a significant difference between the two treatments.

Research Time and Place

The research was carried out in May 2026 at the Culinary Laboratory, Department of Family Welfare Sciences, Faculty of Tourism and Hospitality, Padang State University.

Tools and Materials

The equipment used consists of preparation tools such as digital scales, strainers, and work cloths, as well as processing tools that include *mixing bowls*, *rubbers*, *spatulas*, baking pans and steamers. The materials used can be seen in Table 1 below:

Table 1. Ingredients of glutinous rice talam cake			
No.	Components	Composition of Research Materials	
		X0	X1
Bottom Layer Material			
1	White glutinous rice	500 gr	500 gr
2	Pandan leaves	10 gr	10 gr
3	Coconut milk	300 ml	300 ml
4	Salt	5 gr	5 gr
Top Layer Material			
1	Chicken eggs	6 grains	6 grains
2	Granulated sugar	200 gr	200 gr
3	Coconut milk	300 ml	300 ml
4	Dragon fruit peel extract	-	50 ml
5	Wheat flour	100 gr	100 gr
6	Rice flour	10 gr	10 gr

Research Procedure

The research was carried out through three stages. First, the preparation stage includes the preparation and weighing of all ingredients according to the formulation of each treatment, namely control glutinous rice with the addition of suji leaf and pandan leaf water (X0) and glutinous rice with the addition of red dragon fruit peel extract (X1), as well as the preparation of all the equipment needed in a clean and ready-to-use condition.

Second, the implementation stage begins with the manufacture of dragon fruit peel extract: the dragon fruit peel is separated from the pulp, washed clean, cut into small pieces, then blended with coconut milk until smooth and filtered to obtain a dreg-free extract. Next, the glutinous rice is washed and steamed with pandan leaves until half-cooked. Liquid coconut milk is boiled with salt until boiling, then poured into half-cooked sticky rice and stirred well. The glutinous rice dough is then steamed again until cooked, flattened and compacted in a baking dish that has been greased with oil as a bottom layer. The top layer is made by beating eggs and granulated sugar until fluffy, then adding thick coconut milk, water, wheat flour, and

rice flour, accompanied by the addition of suji leaf water in the X0 treatment or dragon fruit peel extract in the X1 treatment, then stirred until it becomes a smooth dough and filtered. The top layer of dough is poured over the dense layer of glutinous rice, then steamed again for 30 minutes until cooked and dense. The cooked cake is cooled, cut, packaged, and treated coded.

Third, the sensory evaluation stage was carried out through organoleptic testing of all samples by panelists. The stages of the research are presented in image 1 below.



Image 1. Flow of the Process of Making Dragon Fruit Peel Extract Sticky Rice Talam Cake

Data Collection Instruments and Techniques

Data were collected through organoleptic tests which included rating tests and hedonic tests. The rating test is used to assess the suitability of the quality of glutinous rice talam cakes on the parameters of shape, color, aroma, texture, and taste based on the quality descriptors that have been set, namely uniform shape, pink color, aroma of coconut milk, chewy texture, and sweetness. The hedonic test was used to measure the level of panelists' likability to the same parameters on a scale of 1 (very dislike) to 7 (very like). The testing was carried out by 30 untrained sensory panelists who were students of the D3 and S1 Programs in Culinary Arts and Family Welfare Education, Department of Family Welfare Sciences, Faculty of Tourism and Hospitality, Padang State University, with the criteria of being in good health, not having allergies to food, and having normal sense of taste and smell. Each sample was presented with a random code and panelists were given the same instructions before the assessment to maintain consistency of the results, then assessed independently using the instrument sheet provided.

Data Analysis Techniques

The data from the rating test and hedonic test were tabulated in the form of a table, then analyzed using the average difference test of *Independent Samples t-test* (t-pooled variance test) at a significance level of 5% to find out whether there was a significant difference between pandan glutinous rice cake (X0) and glutinous rice cake with dragon fruit peel extract (X1) in each parameter. When the value $|t_{\text{counts}}| > t_{\text{table}}$ with a significance value of < 0.05 , then H_0 is rejected and H_a is accepted, which means that there is a significant difference between the two treatments of the tested parameters.

RESULTS AND DISCUSSION

The research that has been carried out produces a data that will be analyzed. In this study, the data analysis discussed was a comparison of the quality of pandan sticky rice talam cake (X0) and the quality of sticky rice talam cake with dragon fruit peel extract (X1). The data will

be described in the form of a table with average values and hypothesis test results based on color, aroma, texture, and taste which will be described in the following description:

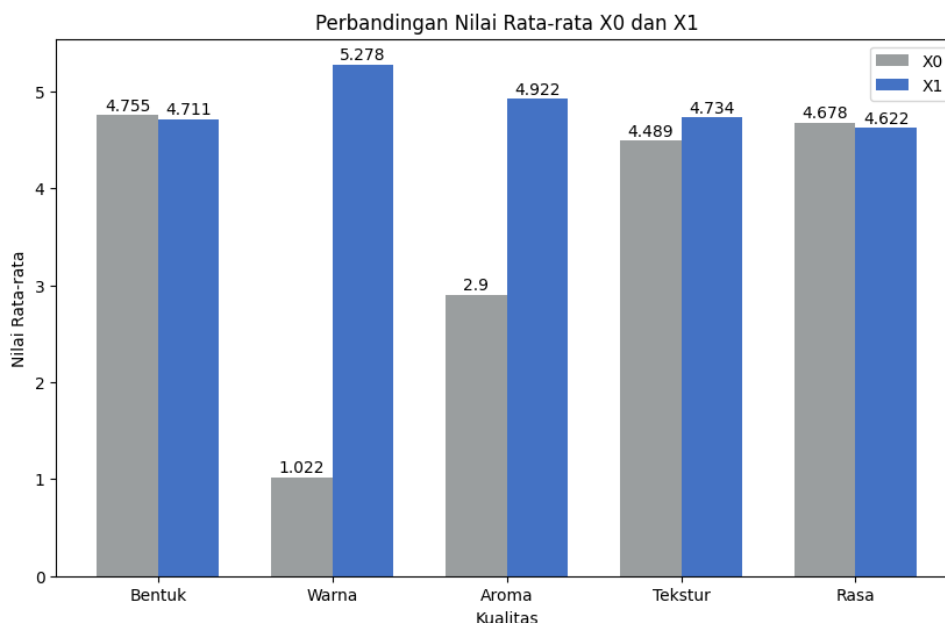


Image 2. Research Results of the Baking Test of Pandan Sticky Rice Talam Cake with Sticky Rice Talam Cake with Dragon Fruit Peel Extract

Based on the results of the reteng test presented, it is known that the average research score on the quality of glutinous rice talam cake varies with each comparison treatment of 50ml of dragon fruit peel extract. The highest average score for the form aspect was obtained in the X0 treatment as low as 4,755, the highest average for the color aspect obtained in the X1 treatment was 5,278, the highest average for the aroma aspect in the X1 treatment was 4,922, then the highest average for the texture aspect was obtained in the X1 treatment of 4,734 and the highest average for the taste aspect was obtained in the X1 treatment of 4,678. Then the results of the hedonic test research can be seen in the following image:

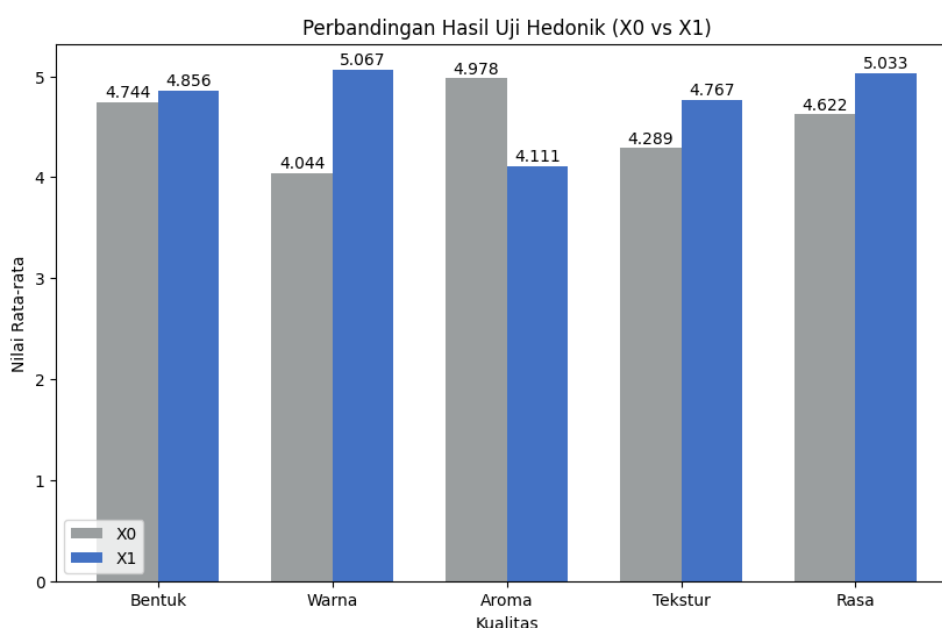


Image 3. Average Hedonic Test of Glutinous Rice Talam Cake

Based on the results of the hedonic test research presented, it is known that the average research score on the acceptability of glutinous rice talam cake varies with each comparison treatment of dragon fruit peel extract as much as 50ml. The highest average for the form aspect obtained in the X1 treatment was 4,856, the highest average for the color aspect obtained in the X1 treatment was 5,067, the highest average for the aroma aspect was in the X1 treatment of 4,978, then the highest average for the texture aspect was obtained in the X1 treatment of 4,676 and the highest average for the taste aspect obtained in the X1 treatment was 5,033.

Test Rating

1. Shape

Table 2. Average Quality of Glutinous Rice Talam Cake

X0 (pandan sticky rice cake)	X1 (Dragon Fruit Extract Sticky Rice Cake)
4,76	4,71

Based on the results of the study, the average value of the quality of the shape of pandan sticky rice cake without dragon fruit peel extract (X0) was 4.76, while pandan sticky rice cake with dragon fruit peel extract (X1) obtained an average value of 4.71. The results of the study that have been carried out show that the two treatments have almost the same value with a difference of $4.76 (X0) - 4.71 (X1) = 0.04$. Based on the results of the Independent Samples t-test, a calculated t value of 0.230 was obtained, while the t table was 2.00172 with a significance value of 0.819. This indicates that $|t \text{ counts}| < t \text{ table}$ ($0.230 < 2.00172$) and significance values greater than 0.05 ($0.819 > 0.05$), so it can be concluded that there is no significant difference between the two treatments on the quality of the shape of pandan sticky rice cake. Thus, H_0 was accepted and H_a was rejected, which means that the addition of dragon fruit peel extract did not have a noticeable effect on the quality of the shape of the pandan sticky rice talam cake.

The results of this study are in line with the opinion of Rachma Sari & Siqhny (2022) who stated that the shape of food products is more influenced by the formulation of the main ingredients and processing process than the addition of natural ingredients in a certain amount. In addition, the research of Holinesti et al., (2022) also explains that the use of natural additives generally has more effect on visual characteristics, such as color, than on the shape of the product if the basic formulation and processing process do not change. Therefore, the addition of dragon fruit peel extract to pandan sticky rice cake can be done without reducing the quality of the product form, so that the cake still has a complete, neat shape, and in accordance with the characteristics of the talam cake expected by the panelists.

2. Color

Table 3. Average Color Value of Glutinous Rice Talam Cake

X0 (pandan sticky rice cake)	X1 (Dragon Fruit Extract Sticky Rice Cake)
1,03	5,28

Based on the results of the study, the average color quality of pandan sticky rice cake without dragon fruit peel extract (X0) was 1.03, while pandan sticky rice cake with dragon fruit peel extract (X1) obtained an average value of 5.28. The results of the study that have been carried out show that the two treatments have a very clear difference with a difference of $5.28 (X1) - 1.03 (X0) = 4.25$. Based on the results of the Independent Samples t-test, a t-test value of -42.115 was obtained, while the t-table was 2.00172 with a significance value of 0.000. This indicates that $|t \text{ counts}| > t \text{ table}$ ($42.115 > 2.00172$) and significance values are less than 0.05

($0.000 < 0.05$), so it can be concluded that there is a significant difference between the two treatments on the color quality of pandan sticky rice cakes. Thus, H_0 is rejected and H_a is accepted, which means that the addition of dragon fruit peel extract has a noticeable influence on the color quality of pandan sticky rice talam cake.

The results of this study are in line with a study (Nurliyana et al., 2010) which states that red dragon fruit peel contains the pigment betacyanin which has the potential to be used as a natural dye in various food products. Research (Holinesti et al., 2022) also explains that the use of natural dyes from food can improve the visual characteristics of products so that they are more attractive and increase consumer acceptance. Therefore, the use of dragon fruit peel extract in pandan sticky rice talam cake not only functions as a natural color, but is also able to improve the color quality of the product so as to produce a more attractive, bright, and in accordance with the panelists' expectations.

3. Aroma

Table 4. Average Value of Aroma of Glutinous Rice Talam Cake

X0 (pandan sticky rice cake)	X1 (Dragon Fruit Extract Sticky Rice Cake)
2,90	4,92

Based on the results of the study, the average quality of the aroma quality of pandan sticky rice cake without dragon fruit peel extract (X0) was 2.90, while pandan sticky rice cake with dragon fruit peel extract (X1) obtained an average value of 4.92. The results of the study that have been carried out show that the two treatments have a fairly clear difference with a difference of 4.92 (X1) – 2.90 (X0) = 2.02. Based on the results of the Independent Samples t-test, the t-test value was -8.494, while the t-table was 2.00172 with a significance value of 0.000. This indicates that $|t \text{ counts}| > t \text{ table}$ ($8.494 > 2.00172$) and significance values were less than 0.05 ($0.000 < 0.05$), so it can be concluded that there is a significant difference between the two treatments on the aroma quality of pandan sticky rice cakes. Thus, H_0 is rejected and H_a is accepted, which means that the addition of dragon fruit peel extract has a noticeable influence on the quality of the aroma of pandan sticky rice cake.

The results of this study are in line with research (Holinesti et al., 2022) which states that the addition of natural ingredients to food products can improve sensory characteristics, including aroma, thereby increasing consumer acceptance. In addition, research (Nurliyana, 2023) explains that dragon fruit peel contains various bioactive compounds that in addition to functioning as a source of antioxidants can also provide sensory characteristics that support the quality of processed food products. Therefore, the use of dragon fruit peel extract in pandan sticky rice talam cake not only increases the functional value of the product, but is also able to improve the quality of the aroma so that it produces a more fragrant product and is preferred by panelists than pandan sticky rice talam cake without the addition of dragon fruit peel extract.

3. Texture

Table 5. Average Texture Value of Glutinous Rice Talam Cake

X0 (pandan sticky rice cake)	X1 (Dragon Fruit Extract Sticky Rice Cake)
4,49	4,73

Based on the results of the study, the average value of the texture quality of pandan sticky rice cake without dragon fruit peel extract (X0) was 4.49, while pandan sticky rice cake with dragon fruit peel extract (X1) obtained an average value of 4.73. The results of the study that have been carried out show that the two treatments have a difference of 4.73 (X1) – 4.49 (X0) = 0.22. Based on the results of the Independent Samples t-test, the t-test value was -1.354, while the t-table was 2.00172 with a significance value of 0.181. This indicates that $|t \text{ counts}|$

$< t$ table ($1.354 < 2.00172$) and significance values greater than 0.05 ($0.181 > 0.05$), so it can be concluded that there is no significant difference between the two treatments on the texture quality of pandan sticky rice cake. Thus, H_0 is accepted and H_a is rejected, which means that the addition of dragon fruit peel extract does not have a noticeable effect on the texture quality of pandan sticky rice cake.

The results of this study are in line with a study (Nurliyana et al., 2010) which states that dragon fruit peel contains pectin and dietary fiber that have the potential to improve the physical properties of processed food products. In addition, (Holinesti et al., 2022) explain that the use of natural additives can help retain the moisture of the product, but the change in texture does not always show a significant difference if the composition of the main ingredient and the processing process remain the same. Therefore, the addition of dragon fruit peel extract to pandan sticky rice cake can descriptively improve the quality of texture without providing statistically noticeable changes, so that the product still has a soft, chewy texture, and in accordance with the expected characteristics of the talam cake.

4. Taste

Table 6. Average Taste of Glutinous Rice Talam Cake

X0 (pandan sticky rice cake)	X1 (Dragon Fruit Extract Sticky Rice Cake)
4,68	4,62

Based on the results of the study, the average value of the taste quality of pandan sticky rice cake without dragon fruit peel extract (X0) was 4.68, while pandan sticky rice cake with dragon fruit peel extract (X1) obtained an average value of 4.62. The results of the study that have been carried out show that the two treatments have almost the same value with a difference of 4.6 (X0) – 4.62 (X1) = 0.03. Based on the results of the Independent Samples t-test, a calculated t value of 0.269 was obtained, while the t table was 2.00172 with a significance value of 0.789. This indicates that $|t \text{ counts}| < t \text{ table}$ ($0.269 < 2.00172$) and significance values greater than 0.05 ($0.789 > 0.05$), so it can be concluded that there is no significant difference between the two treatments on the taste quality of pandan glutinous rice cake. Thus, H_0 is accepted and H_a is rejected, which means that the addition of dragon fruit peel extract does not have a noticeable effect on the taste quality of pandan sticky rice talam cake.

The results of this study are in line with the research of Cindy Amelia et al (2025) which stated that dragon fruit peel has more potential to be used as a source of natural dyes and antioxidants than as a dominant flavor provider in food products. In addition, Holinesti et al. (2022) explained that the addition of natural ingredients at certain concentrations does not always provide a noticeable change in taste characteristics if the main ingredient that has a dominant flavor is maintained. Therefore, the use of dragon fruit peel extract in pandan glutinous rice talam cake can increase the functional value and appearance of the product without reducing the distinctive taste of talam cake, so that the product still has a delicious, distinctive, and well-received taste

Hedonic Test

a. Shape

Table 7. Average Value of Glutinous Rice Talam Cake Shape

X0 (pandan sticky rice cake)	X1 (Dragon Fruit Extract Sticky Rice Cake)
4,74	4,86

Based on the results of the study, the average value of the panelists' preference level for the form of pandan sticky rice cake without dragon fruit peel extract (X0) was 4.74, while

pandan sticky rice cake with dragon fruit peel extract (X1) obtained an average score of 4.86. The results of the study that have been carried out show that the two treatments have a difference of 4.86 (X1) – 4.74 (X0) = 0.13. Based on the results of the Independent Samples t-test, a calculated t value of -0.551 was obtained, while the t table was 2.00172 with a significance value of 0.584. This indicates that $|t \text{ counts}| < t \text{ table}$ ($0.551 < 2.00172$) and significance values greater than 0.05 ($0.584 > 0.05$), so it can be concluded that there is no significant difference between the two treatments of the panelists' level of preference in the form of pandan sticky rice talam cake. Thus, H_0 was accepted and H_a was rejected, which means that the addition of dragon fruit peel extract did not have a noticeable effect on the panelists' level of preference for the shape aspect.

b. Color

Table 8. Average Color Value of Glutinous Rice Talam Cake

X0 (pandan sticky rice cake)	X1 (Dragon Fruit Extract Sticky Rice Cake)
4,04	5,07

Based on the results of the study, the average value of the panelists' preference level for the color of pandan sticky rice cake without dragon fruit peel extract (X0) was 4.04, while pandan sticky rice cake with dragon fruit peel extract (X1) obtained an average value of 5.07. The results of the study that have been carried out show that the two treatments have a difference of 5.07 (X1) – 4.04 (X0) = 1.00. Based on the results of the Independent Samples t-test, the t-test value was -5.220, while the t-table was 2.00172 with a significance value of 0.000. This indicates that $|t \text{ counts}| > t \text{ table}$ ($5.220 > 2.00172$) and significance values were less than 0.05 ($0.000 < 0.05$), so it can be concluded that there was a significant difference between the two treatments of the panelists' level of preference for the color of pandan sticky rice talam cake. Thus, H_0 was rejected and H_a was accepted, which means that the addition of dragon fruit peel extract had a real influence on the panelists' level of preference for the color aspect.

c. Aroma

Table 9. Average Value of Aroma of Glutinous Rice Talam Cake

X0 (pandan sticky rice cake)	X1 (Dragon Fruit Extract Sticky Rice Cake)
4,98	4,11

Based on the results of the study, the average value of the panelists' preference level for the aroma of pandan sticky rice cake without dragon fruit peel extract (X0) was 4.98, while pandan sticky rice cake with dragon fruit peel extract (X1) obtained an average score of 4.11. The results of the study that have been carried out show that the two treatments have a difference of 4.98 (X0) – 4.11 (X1) = 0.90. Based on the results of the Independent Samples t-test, the t-test value was obtained at 3.692, while the t-table was 2.00172 with a significance value of 0.001. This indicates that $|t \text{ counts}| > t \text{ table}$ ($3.692 > 2.00172$) and the significance value was less than 0.05 ($0.001 < 0.05$), so it can be concluded that there was a significant difference between the two treatments of the panelists' level of preference for the aroma of pandan sticky rice cake. Thus, H_0 was rejected and H_a was accepted, which means that the addition of dragon fruit peel extract had a real influence on the panelists' preference level for the aroma aspect.

d. Texture

Table 10. Average Value of Sticky Rice Talam Cake Texture

X0 (pandan sticky rice cake)	X1 (Dragon Fruit Extract Sticky Rice Cake)
4,29	4,77

Based on the results of the study, the average value of the panelists' preference level for the texture of pandan sticky rice cake without dragon fruit peel extract (X0) was 4.29, while pandan sticky rice cake with dragon fruit peel extract (X1) obtained an average score of 4.77. The results of the study that have been carried out show that the two treatments have a difference of 4.77 (X1) – 4.29 (X0) = 0.47. Based on the results of the Independent Samples t-test, the t-test value was -2.383, while the t-table was 2.00172 with a significance value of 0.021. This indicates that $|t \text{ counts}| > t \text{ table}$ ($2.383 > 2.00172$) and significance values were less than 0.05 ($0.021 < 0.05$), so it can be concluded that there was a significant difference between the two treatments of the panelists' level of preference for the texture of pandan glutinous rice cake. Thus, H_0 was rejected and H_a was accepted, which means that the addition of dragon fruit peel extract had a noticeable influence on the panelists' preference level on the texture aspect.

Taste

Table 11. Average Taste Value of Glutinous Rice Talam Cake

X0 (pandan sticky rice cake)	X1 (Dragon Fruit Extract Sticky Rice Cake)
4,62	5,03

Based on the results of the study, the average value of the panelists' preference level for the taste of pandan sticky rice cake without dragon fruit peel extract (X0) was 4.62, while pandan sticky rice cake with dragon fruit peel extract (X1) obtained an average value of 5.03. The results of the study that have been carried out show that the two treatments have a difference of 5.03 (X1) – 4.62 (X0) = 0.39. Based on the results of the Independent Samples t-test, the t-test value was -2.208, while the t-table was 2.00172 with a significance value of 0.031. This indicates that $|t \text{ counts}| > t \text{ table}$ ($2.208 > 2.00172$) and significance values were less than 0.05 ($0.031 < 0.05$), so it can be concluded that there was a significant difference between the two treatments of the panelists' level of preference for the taste of pandan glutinous rice talam cake. Thus, H_0 was rejected and H_a was accepted, which means that the addition of dragon fruit peel extract had a real influence on the panelists' level of preference in terms of taste.

CONCLUSION

Based on the research findings and discussion regarding the analysis of differences in organoleptic quality and hedonic preference levels between pandan glutinous rice talam cake without dragon fruit peel extract (X0) and the version with added dragon fruit peel extract (X1), several key conclusions can be drawn. First, regarding organoleptic (objective) quality, the addition of dragon fruit peel extract significantly influenced the cake's color and aroma characteristics but had no significant effect on shape, texture, or taste. The X1 formula yielded a much brighter and more attractive reddish-purple color thanks to the natural betalain pigments in the dragon fruit peel and an aroma perceived as fresh and well-blended with the coconut milk and pandan, making it appealing. Meanwhile, physical shape stability, textural softness, and the cake's characteristic sweet-savory flavor were successfully maintained in both formulas, with no differences that compromised the cake's original structure.

Second, regarding hedonic assessment (preference levels), the addition of dragon fruit peel extract was shown to significantly increase panelist acceptance in terms of color, texture, and taste. Panelists gave significantly higher preference scores to the reddish-purple visual appearance of the X1 cake. Its texture was perceived as slightly denser and chewier due to the dragon fruit peel's high fiber content, which provided a unique structural quality that panelists enjoyed. Beyond texture, the final product's flavor in this formula was also considered more harmonious and delicious. However, panelist preference for the cake's aroma dropped significantly with the X1 formula, as panelists still preferred the pure, conventional aroma of pandan leaves and coconut milk without the distinct aromatic influence of the dragon fruit peel. Overall, the formulation with added dragon fruit peel extract (X1) was the superior treatment, as it successfully enhanced visual appeal and produced a texture that was slightly dense and chewy without diminishing the product's overall quality.

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