



DEVELOPMENT OF ALTERNATIVE FOODS USING LOCAL INGREDIENTS AS A LEADING CULINARY TOURISM PRODUCT: A TASTE STUDY OF SWISS ROLL JACKFRUIT SEEDS AND DRAGON FRUIT SKIN

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ABSTRACT

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This study aims to develop Swiss roll by utilizing jackfruit seeds and dragon fruit skin as an alternative local food that is highly nutritious and becomes one of Indonesia's typical foods with local food ingredients that can be an attraction for tourists to taste the typical food. The research used is quantitative research with a hedonic panelist test. The time and place of the preliminary research and further research were carried out from January to March 2025 at the Tourism Department, Balikpapan State Polytechnic. The results of the average value of the taste of Swiss roll products with the use of jackfruit seed powder in the Swiss roll dough with dragon fruit skin as a filling. The results showed that the taste in F1 had an average value of 4.00, in F2 the average value was 3.90 and in F3 the average value was 3.27. It can be concluded that the most preferred by panelists was the F1 taste with an average value of 4.00. This product has proven to be acceptable to panelists and provides a highly nutritious food alternative based on local ingredients and can increase the appeal of tourists in the culinary field.

Keywords: Swiss Roll; Jackfruit Seeds; Dragon Fruit Skin; Hedonic Test.

INTRODUCTION

Indonesia is rich in biodiversity, which has the potential to be utilized in the food sector. Jackfruit is one of our country's natural resources. This plant, known as jackfruit, is easy to cultivate in various environments and can be found throughout the Indonesian archipelago. So it will be easy to get jackfruit everywhere (Umbu Kaleka, 2020). According to the Central Statistics Agency, in 2023 Indonesia produced 7,891,997 quintals of jackfruit (Statistics, 2024). Jackfruit seeds are a food ingredient that is underutilized and unknown to people. The existence of jackfruit seeds is only used as seeds or animal feed. Jackfruit seeds are only used by boiling, roasting or roasting. The utilization of jackfruit seeds has not been carried out



optimally, even though jackfruit seeds contain high nutritional value (Nurhayati et al., 2020). The nutritional content of 100 grams of jackfruit seeds contains 165 kcal of energy, 4.2 grams of protein, 36.7 grams of carbohydrates, and 0.1 grams of fat. In addition to its macronutrient content, jackfruit seeds are also rich in micronutrients, namely in 100 grams of jackfruit seeds there is 1 mg of phosphorus, 33 mg of calcium, and 200 mg of iron (Nizori, 2020).

Dragon fruit (*Hylocereus polyrhizus*) is one of the plants that is good to be developed in Indonesia. The largest dragon fruit plantations are only found on the islands of Java and Kalimantan to the Sulawesi Strait (Purnama et al., 2019). Dragon fruit has benefits for strengthening the kidneys, balancing blood sugar levels, maintaining liver health, improving visual acuity, relieving symptoms of stomach ulcers and canker sores, blood pressure, preventing vaginal discharge, lowering cholesterol levels, preventing colon cancer, preventing constipation, and facilitating bowel movements (Nurlaila et al., 2024). The increase in dragon fruit consumption has resulted in the presence of dragon fruit skins also increasing (Sindi Cristina et al., 2022).

So far, dragon fruit skins have only been thrown away by the community because they are considered less useful. This is a problem with the accumulation of dragon fruit skins that are not utilized properly. At any time, dragon fruit skins will pollute the environment if left alone without any waste management (Sindi Cristina et al., 2022). In fact, the nutritional content in every 100 grams of dragon fruit skin contains 264 grams of protein, 82.14 grams of carbohydrates, 3.57 grams of fiber, 1.8 grams of phosphorus, and 82.14 mg of vitamin C (Karmila et al., 2021).

Swiss roll is a type of roll cake product originating from England, but some also say that Swiss roll originated from America through the publication of an annual recipe contained in the American Pastry Cook, 1894 (U. Yuyun et al., 2022). This Swiss roll is made from several ingredients, namely eggs, flour, sugar, margarine, and other additional ingredients, then baked in the oven using a rectangular pan and smeared with jam or buttercream (Kandoli et al., 2022). Swiss roll, is a type of pastry that is popular in various countries, providing a great opportunity to innovate by combining local ingredients. In making Swiss roll, the author uses jackfruit seeds in the Swiss roll dough and dragon fruit skin as Swiss roll filling, because he wants to reduce the by-products of jackfruit and dragon fruit by utilizing jackfruit seeds and dragon fruit skin.

Swiss roll using jackfruit seeds and dragon fruit skin, in addition to being an alternative local food that is highly nutritious, can also be a food with local food ingredients that can be an attraction for tourists to taste the typical food, so that indirectly it can increase Indonesia's economic income in the tourism sector. As according to Putra, et.al., (2014) that culinary tourism is an activity of tourists to find unique and impressive food and drinks. Culinary tourism is one of the attractions for domestic and foreign tourists who take a tour with the aim of enjoying various types of food. Culinary tourism in Indonesia is currently a mainstay for people in various tourist attractions.

This is also supported by Putri's opinion (2023) which explains that culinary tourism that makes typical food/drinks of a region to be able to improve tourism performance in that place is often used as a diplomatic tool. Not only to popularize the place literally, but also as a potential that can be used to introduce other aspects

that are still related to the place as well. Therefore, food/drinks through culinary tourism are often used as a field in a series of cultural and social promotions of the background of the region/city.

METHOD

The research used is quantitative research with hedonic panelist test. The panelists in this study numbered 30 panelists, with the selection criteria for panelists must have the requirements, namely 5th semester culinary study program students who have studied hedonic tests in food quality control courses at Balikpapan State Polytechnic. This is done so that the data produced is more accurate and subjective. This research was conducted by the author in 2 stages of research, namely the first stage of preliminary research and the second stage of further research:

Preliminary Research

In the preliminary research, the author conducted a trial of the reference recipe to determine the success of the reference recipe, then continued with the experimental research method of making Swiss rolls by utilizing jackfruit seed powder in the Swiss roll dough and dragon fruit skin as a Swiss roll filling to obtain the right formulation with formulations F1, F2, F3.

Further Research

In the further research, the author conducted research by experimenting. The author will continue the research with organoleptic tests, namely hedonic tests and hedonic quality tests to determine the level of preference and product quality by utilizing jackfruit seed powder in the Swiss roll dough and dragon fruit skin as a filling in the Swiss roll given to panelists based on aspects of color, aroma, texture and taste.

This study uses hedonic test for processed Swiss roll products by utilizing jackfruit seed powder and dragon fruit skin as filling in Swiss roll. The goal is to determine the level of consumer acceptance of the product. Hedonic test is also called preference test. Panelists can express their level of preference.

RESULTS AND DISCUSSION

The experiment of making Swiss roll with jackfruit seed powder and dragon fruit skin was conducted with two trials. In the first trial, the Swiss roll produced was not good, namely the results were found that the Swiss roll using jackfruit seed powder, in terms of color, was brown, in terms of aroma, the Swiss roll had a jackfruit seed aroma, in terms of taste, it tasted like jackfruit seeds, and in terms of texture, the Swiss roll had a very dense texture, because during the mixing process using the foalading technique it took too long because the author felt that the dough had not been mixed evenly, so that during the stirring process the dough became liquid, and during the baking process the dough became less fluffy or flat. Sponge cake dough needs to be beaten for the right duration. Beating too long can cause the dough to be flat due to too much air, while beating too short can cause the dough to be less stable and fall easily (Nuraini, 2023).

The results of the first experiment of 3 formulations, namely in formula 1 from the aspect of color, namely yellow, from the aspect of aroma, the Swiss roll has a butter aroma, does not have a jackfruit seed aroma, from the aspect of taste, it does not taste of jackfruit seeds, and from the aspect of texture, the Swiss roll has a soft texture. The first experiment of Swiss roll in formula 2 from the aspect of color is slightly brownish, from the aspect of aroma, the Swiss roll has a slightly jackfruit seed aroma, from the aspect of taste it tastes of jackfruit seeds, and from the aspect of texture, the Swiss roll has a solid texture, because during the stirring process with the foaming technique it takes too long to make the dough runny, so that during the baking process the dough becomes less fluffy. The first experiment of swiss roll on formula 3 from the aspect of color is brownish, from the aspect of aroma swissroll has jackfruit seed aroma, from the aspect of taste tastes of jackfruit seeds, and from the aspect of texture swiss roll has a very dense texture, because when the stirring process with the foaming technique is too long makes the dough become liquid, so that when the baking process the dough becomes less fluffy. Because the results of the first experiment were not satisfactory, the second product experiment was continued.

In the second trial, the two researchers conducted an experiment with the same formulation as the first trial, but with a different stirring technique. The author beat the eggs, sugar and emulsifier until fluffy, then added dry ingredients such as jackfruit seed powder, wheat flour, powdered milk, and cornstarch and melted butter. After that, the author beat briefly until the dough was evenly mixed. Because this method makes it easier for the author in the stirring process compared to the technique that has been tried before, the Swiss roll can produce a soft texture and delicious taste. Based on the second experiment that has been done, it was obtained that the swiss roll in formula 1 from the aspect of color is yellow, from the aspect of aroma the swiss roll has a butter aroma, from the aspect of taste it does not taste like jackfruit seeds, and from the aspect of texture the swiss roll has a soft texture.

The second experiment of swiss roll in formula 2 from the aspect of color is slightly brownish, from the aspect of aroma the swiss roll has a slightly jackfruit seed aroma, from the aspect of taste it tastes like jackfruit seeds, and from the aspect of texture the swiss roll has a soft texture. The second experiment of swiss roll in formula 3 from the aspect of color is brown, from the aspect of aroma the swiss roll has a jackfruit seed aroma, from the aspect of taste it tastes like jackfruit seeds, and from the aspect of texture the swiss roll has a soft texture. After the experiment was carried out and was successful, it was then distributed to the panelists, then the data was processed, this study used a hedonic test. The following are the results of the hedonic test in terms of taste by utilizing jackfruit seeds in the Swiss roll dough and dragon fruit skin as a filling in the Swiss roll:

F1 flavor with 20% jackfruit seed powder

The results obtained from the hedonic test on the taste aspect of the first formula (F1) can be seen in the following table:

Table 1. Frequency of Hedonic Test of F1 Flavor

F1_Flavor					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	Very Dislike	0	0.0	0.0	0.0
	Do not like	0	0.0	0.0	0.0
	little like	9	30.0	30.0	30.0
	Like	12	40.0	40.0	70.0
	Really like	9	30.0	30.0	100.0
	Total	30	100.0	100.0	

The table above shows the results of the hedonic test on the taste of formula 1 in making Swiss rolls by utilizing jackfruit seed powder in the Swiss roll dough with dragon fruit skin as a filling on a scale of very dislike (1) and dislike (2) no panelists chose, there were 9 panelists who chose somewhat like (3) with a percentage of 30%, there were 12 panelists who chose like (4) with a percentage of 40%, and 9 panelists chose very like (5) with a percentage of 30%. The following diagram of the results of the hedonic taste test can be seen in the following image:

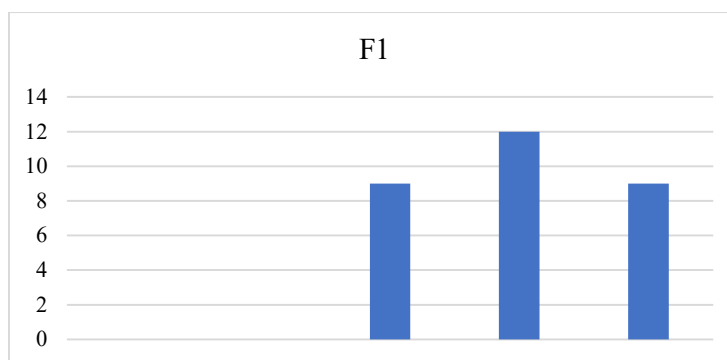


Figure 1. Hedonic Taste Test Diagram F1

The image above shows the results of the hedonic taste test in the diagram above, the taste results found in F1 on a scale of very dislike (1) and dislike (2) no panelists chose, those who chose like (4) were in the first order, the most were 12 panelists, those who really liked (5) and those who chose somewhat like (3) were in the same order, as many as 9 panelists.

Flavor with 30% jackfruit seed powder

The results obtained from the hedonic test on the taste aspect of the second formula (F2) can be seen in the following table:

Table 2. Frequency of Hedonic Test of F2 Flavor

F2_Flavor		Frequency	Percent	Valid percent	Cumulative percent
Valid	Very Dislike	0	0.0	0.0	0.0
	Do not like	0	0.0	0.0	0.0
	little like	6	20.0	20.0	20.0
	Like	21	70.0	70.0	90.0
	Really like	3	10.0	10.0	100.0
	Total	30	100.0	100.0	

Table 2 shows the results of the hedonic test on the taste of formula 2 in making Swiss rolls by utilizing jackfruit seed powder in the Swiss roll dough with dragon fruit skin as a filling on a scale of very dislike (1) and dislike (2) no panelists chose, there were 6 panelists who chose rather like (3) with a percentage of 20%, there were 21 panelists who chose like (4) with a percentage of 70%, and 3 panelists chose very like (5) with a percentage of 10%. The following diagram of the results of the hedonic taste test can be seen in Figure 2.

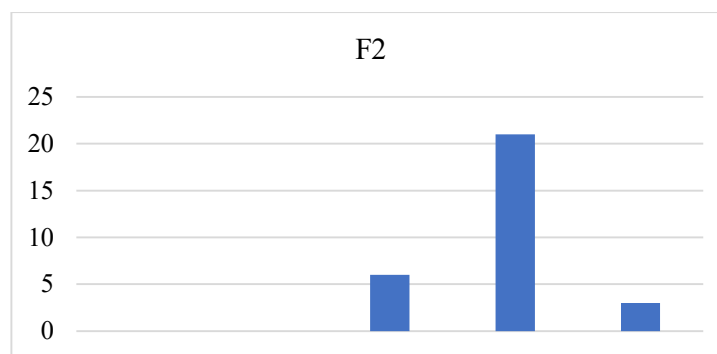


Figure 2. Hedonic Taste Test Diagram F2

Figure 2. shows the results of the hedonic taste test in the diagram above, it was found that the taste results in F2 on the scale of very dislike (1) and dislike (2) were none of the panelists who chose, those who chose like (4) were in the first place, the most were 21 panelists, those who chose rather like (3) were in the second place, 6 panelists, and those who chose very like (5) were in the third place, 3 panelists.

F3 Flavor with 40% jackfruit seed powder

The results obtained from the hedonic test on the taste aspect of the third formula (F3) can be seen in table 3.

Table 3. Frequency of Hedonic Test of F3 Flavor
F3_Flavor

		<i>Frequency</i>	<i>Percent</i>	<i>Valid percent</i>	<i>Cumulative percent</i>
<i>Valid</i>	Very Dislike	0	0.0	0.0	0.0
	Do not like	3	10.0	10.0	10.0
	little like	17	56.7	56.7	66.7
	Like	9	30.0	30.0	96.7
	Really like	0	0.0	0.0	96.7
	Total	1	3.3	3.3	100.0
		30	100.0	100.0	

Table 3 shows the results of the hedonic test on the taste of formula 3 in making Swiss rolls by using jackfruit seed powder in the Swiss roll dough with dragon fruit skin as a filling on a scale of very dislike (1) no panelists chose, there were 3 panelists who chose dislike (2) with a percentage of 10%, there were 17 panelists who chose rather like (3) with a percentage of 56.7%, who there were 9 panelists chose like (4) with a percentage of 30%, and there was 1 panelist who chose very like (5) with a percentage of 3.3%. The following diagram of the results of the hedonic taste test can be seen in Figure 3.

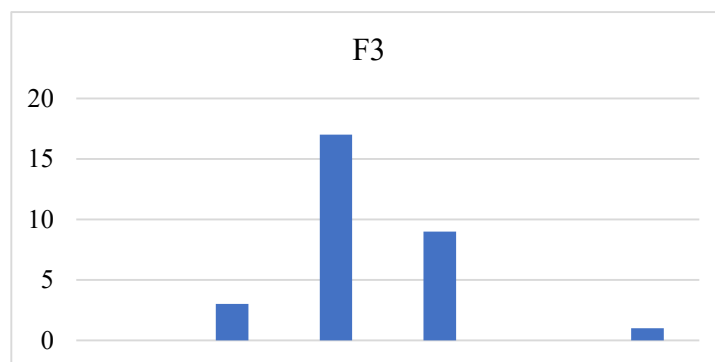


Figure 3. Hedonic Taste Test Diagram F3

Figure 3. shows the results of the hedonic taste test in the diagram above, the taste results in F3 on a scale of very dislike (1) no panelists chose, those who chose rather like (3) were in the first place, the most were 17 panelists, those who chose like (4) were in the second place, 9 panelists, those who chose dislike (2) were in the third place, and those who chose very like (5) were in the last place, 1 panelist.

In the hedonic test, the author wanted to know the conclusions of 30 panelists about the level of panelist preference for the taste of Swiss roll with the use of jackfruit seed powder in the Swiss roll dough with dragon fruit skin as a filling in several formulas, namely F1, F2, F3. The results are found in the table below:

Table 4. Results of the Average Hedonic Test of Taste F1, F2, F3

		<i>Statistics</i>		
		F1_flavor	F2_rasa	F3_rasa
N	<i>Valid</i>	30	30	30
	<i>Missing</i>	0	0	0
<i>Mean</i>		4.00	3.90	3.27
<i>Median</i>		4.00	4.00	3.00
<i>Mode</i>		4	4	3
<i>Sum</i>		120	117	98

Based on the tables above, it shows the results of the average value of the taste of Swiss roll products with the use of jackfruit seed powder in the Swiss roll dough with dragon fruit skin as a filling. It can be concluded that the taste in F1 has an average value of 4.00, in F2 the average value is 3.90 and in F3 it has an average value of 3.27 which means that the values of F1 and F2 are included in the Likert scale 4, namely like. And in F3 it is included in the Likert scale 3 which means quite like. It can be concluded that the most preferred is in the F1 taste with an average value of 4.00.

Based on the data above, it is proven that the development of Swiss roll products using jackfruit seeds and dragon fruit skin as an alternative local food has been proven to be acceptable to the panelists. Swiss roll products using jackfruit seeds and dragon fruit skin can be used as an alternative to increase diversity in the world of tourism, especially in culinary tourism, with the existence of unique culinary tourism like this, it will indirectly also increase the diversity of food in Indonesia so that it can attract tourists from abroad to come to our region or country. As stated by Cohen and Avieli 2004 in Safar et al., 2022, namely the role of local food in tourism activities as an attraction for tourists and the basic needs of tourists in visiting a destination will be able to determine tourist satisfaction. When visiting a destination, tourists can choose various activities that can be done, but often tourists cannot avoid eating and drinking at tourist destinations even though the food available is still foreign to them.

Indonesian cuisine is a tourist attraction because its taste is world-class. Innovation in the culinary industry has the potential to strengthen the creative economy and can boost the growth of national tourism activities, this is evident from the eight cities in Indonesia included in the list of 100 cities out of 16,601 cities that have the best regional and national foods in the world according to the Taste Atlas Awards 2023/2024 Khan (2019). The diversity of culinary from local ingredients will certainly affect the development of the world of tourism, as in the opinion of Prakoso (2018), namely the development of culinary as a tourist attraction certainly has a significant economic impact on the tourism sector. Restaurants, cafes, food markets, and other food industries create jobs and local business opportunities. In addition, culinary can also be a determining factor in extending the duration of tourist visits. The variety of tourist attractions such as the existence of typical food of a destination tends to make tourists stay longer to taste more dishes and explore more places to eat.

This is also supported by the opinion of Kurniansyah (2023), namely that culinary is one of the best ways to understand the culture of a region. Local food and drinks reflect the history, values, and traditions of a community. For example, pasta and pizza are Italian specialties that are famous throughout the world, while sushi

is an iconic dish from Japan. When tourists taste these dishes, they not only explore unique flavors but also feel part of a different culture. This can create a deep and satisfying experience for travelers. In addition, culinary can also be a tool to promote local identity and sustainability. Many tourist destinations emphasize organic food, local food, and environmentally friendly farming methods to support local culture and reduce environmental impact. This allows tourists to engage in environmental conservation efforts while enjoying delicious food.

CONCLUSIONS

The development of Swiss roll products by utilizing jackfruit seeds and dragon fruit skin as an alternative local food has been proven to be acceptable to panelists with the results of the hedonic test, namely the taste in F1 has an average value of 4.00, in F2 the average value is 3.90 and in F3 has an average value of 3.27, so that the product that is most preferred by panelists is the Swiss roll product in the F1 experiment with an average value of 4.00.

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