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Addition of Jackfruit in Making Choux Pastry

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ABSTRACTS

Jackfruit is a popular tropical fruit in Indonesia, known for its high economic value and nutritional benefits. Widely available across regions, jackfruit is rich in vitamins, minerals, and calories. Both the soft, sweet flesh and the seeds are nutritious, making it a versatile ingredient in various culinary applications. With its unique aroma and taste, jackfruit is often used in traditional dishes and pastries. This research investigates the potential of incorporating jackfruit into Choux Paste to enhance its taste and nutritional content. The study aims to determine the public's acceptance of jackfruit-enriched Choux Paste and assess its impact on sensory attributes such as taste, aroma, texture, and colour. Since jackfruit can alter the texture and consistency of Choux Paste, the research involved careful proportioning. An experimental method was applied using three treatment levels: P1 (control), P2 (70% jackfruit), and P3 (100% jackfruit). The results of organoleptic tests show that the most preferred formulation was P2, with 70% jackfruit. Expert panellists gave it an average score of 2.9 out of 4, totalling 35.8, which falls into category VII. Non-expert panellists rated it slightly higher, with an average score of 3.2 and a total of 37.8, indicating a "like" category. These findings suggest that adding 70% jackfruit can improve the flavour and acceptance of Choux Paste while offering additional nutritional benefits, making it a promising ingredient for product innovation in pastry development.

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1. INTRODUCTION

Tourism is a new style of industry that is capable of spurring rapid economic growth in terms of job opportunities, income, standard of living, and in activating other sectors in tourist-receiving countries. Apart from that, tourism as a complex sector can revive other sectors including industries such as the handicraft industry, souvenir industry, accommodation, and transportation. Tourism contributes significantly to foreign exchange earnings, job creation, and poverty reduction (UNWTO, 2023; Govers & Go, 2020; Kusumaningrum et al., 2021). The interplay between tourism and economic development has become even more prominent post-pandemic, especially in countries relying on natural and cultural attractions (Saarinen et al., 2022).

The positive impact that is beneficial in the economic sector is that tourism activities bring in foreign exchange income for the country and create job opportunities, as well as the possibility for people in tourist destination areas to increase their income and living standards. The tourism and hospitality industries are inherently connected, with hotels being central to providing services to tourists. The hotel industry depends on various departments, particularly the Food and Beverage (F&B) Department, which contributes significantly to customer satisfaction and economic sustainability (Chen & Peng, 2020; Haryanto, 2023; Kementerian Pariwisata dan Ekonomi Kreatif RI, 2022). The importance of culinary services in enhancing tourists' experiences is well-documented in destination marketing strategies (Okumus et al., 2021).

One of the vital units within the F&B Department is the Pastry Department, responsible for sweet food or desserts in events like weddings, coffee breaks, or breakfast buffets. Pastry or patisserie involves complex food processing techniques, especially for classic French-origin products like Choux Pastry. Choux is known for its light and hollow interior structure, enabling it to be filled with various creams (Putri, 2019; Gunawan et al., 2022; Herlina et al., 2023). Proper ingredient ratios and baking techniques are critical to ensure volume expansion and desirable texture (Murti et al., 2021; Widyaningrum & Nugroho, 2020; Sugihartini, 2020).

Jackfruit (Artocarpus heterophyllus Lamk) is a tropical fruit popular in Indonesia, known for its distinctive aroma, sweet flavour, and high nutritional content. This fruit is rich in vitamins (especially vitamin C), minerals, and antioxidants, and is commonly used in various traditional dishes (Widiarti, 2013; Susanto & Damayanti, 2020; Handayani et al., 2021). Its flesh and seeds are both edible and nutritious, making it a potential functional ingredient for modern pastry products (Rahmawati et al., 2022; Fitria et al., 2021; Sari et al., 2023). The fruit's economic potential and abundance make it ideal for product innovation in pastry.

Incorporating jackfruit into Choux Pastry products offers potential benefits in terms of taste, aroma, sensory richness, and visual appeal. However, due to the high water content in jackfruit, proper cooking is essential to prevent adverse effects on the dough's structure and expansion during baking (Kusumaningtyas et al., 2022; Aprilia et al., 2023; Salamah et al., 2024). Jackfruit also contains dietary fibber and antioxidants, adding a health value dimension to the pastry. Nonetheless, the ingredient must be prepared in a way that does not hinder the dough's ability to puff in the oven (Astuti & Indriani, 2021; Pratiwi & Fitriawan, 2022; Lestari et al., 2022).

Culinary experts suggest that when adding ingredients like jackfruit to Choux Pastry, the amount must be carefully controlled. Overuse or improper preparation can interfere with the pastry's texture and volume. Proper processing such as draining excess moisture is critical (Amaliah & Yusuf, 2021; Maulida et al., 2022; Wulandari & Sari, 2023). Additional ingredients

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in pastry dough should maintain harmony with its rising characteristics and preserve its lightness and crispiness (Setiawan et al., 2023; Nirmala et al., 2022; Anggraini et al., 2023).

This research aims to optimize the use of jackfruit, which is commonly limited to dessert toppings or ice cream bases. The innovation here is in elevating jackfruit to a central ingredient in Choux Pastry, potentially increasing its market value and nutritional profile. By utilizing local ingredients, this study supports sustainable culinary development and promotes health-conscious product innovation (Syamsuddin et al., 2022; Dewi et al., 2024; Hidayatullah & Saraswati, 2021). This innovation aligns with current trends in gastronomic tourism, where traditional Flavors are reinterpreted in modern culinary formats (Utami et al., 2023; Farida et al., 2022; Mulyani & Hermawan, 2024).

2. LITERATURE REVIEW

2.1. Understanding Choux Paste

Choux paste in Indonesia is better known as eclairs (Ratnasari, 2014). Choux paste is shaped like cabbage, which refers to the choux paste product called cream puff. Choux paste is defined as a cake that has a soft texture, is hollow in the middle, and is light, so it can be filled with various fillings.

Choux paste dough is made by adding wheat flour to a mixture of water and margarine that is cooked until boiling. After the mixture has cooled, chicken eggs are added one by one while stirring until the mixture no longer sticks to the bowl. Then, the dough is melded and baked in the oven. Eclair dough differs from other types of cake dough because the flour and eggs are cooked before baking (Marom et al., 2014; Wulandari & Sari, 2023; Gunawan et al., 2022).

2.2. Understanding Choux Filling

Choux filling is a culinary term referring to the ingredients placed inside a choux-based pastry, typically ball- or tube-shaped. Choux dough is commonly used to make éclairs and cream puffs. The fillings can consist of various ingredients such as pastry cream, jam, chocolate, fruit, or combinations thereof (Yuli, 2014; Herlina et al., 2023; Okumus et al., 2021).

2.3. Choux Pastry Theory

In Indonesia, Choux Paste is better known as eclairs (Yuli, 2014). The term choux refer to the dough's resemblance to cabbage, particularly in the product known as cream puff. Choux paste is a cake with a soft texture and a hollow centre. The ideal choux dough results in light pastry with a large internal cavity, slightly thick skin, and a soft texture. Choux pastry is categorized into two main shapes: éclair (elongated) and cream puff (round) (Afifah & Sopiany, 2017; Sugihartini, 2020; Widyaningrum & Nugroho, 2020).

2.4. Jackfruit

Jackfruit (*Artocarpus heterophyllus*) is a tropical fruit native to Southeast Asia, particularly found in Indonesia, Malaysia, Thailand, and the Philippines. It has spiny skin and yellow, sweet, aromatic flesh. Jackfruit is not only tasty but also nutritious, containing vitamin C, vitamin B6, folate, potassium, and dietary fibber. Vitamin C and B6 boost the immune system, while folate aids in cell and DNA development. Potassium helps maintain fluid balance, nerve function, and blood pressure.

Fiber in jackfruit supports digestion and reduces the risk of cardiovascular disease. Furthermore, jackfruit contains antioxidants such as flavonoids, tannins, and saponins, which

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may help prevent oxidative cell damage, support heart health, and reduce cancer risk. Jackfruit can be consumed fresh or processed into foods such as dodol, ice cream, cakes, or jackfruit flour. The flour can be used as a food ingredient to improve nutrition and taste. One hundred grams of jackfruit contains 94 kcal, consisting of approximately 3% fat, 92% carbohydrates, and 6% protein (Widiarti, 2013; FatSecret, 2023; Susanto & Damayanti, 2020).

3. METHODS

This research was conducted to analyse the level of liking (taste, aroma, texture and colour) of Choux Paste through organoleptic tests. Data analysis techniques are a series of methods and procedures used to process and analyse data. In this research, the author will use quantitative research methods. This research is a type of experimental research with 3 treatments for the addition of jackfruit, namely control (P1) 50%, (P2) 70% and (P3) 100%. The subjects of this research were 30 non-expert panellists and 3 expert panellists.

4. RESULTS AND DISCUSSION

Non-Expert Panellist Demographic Data Results. The following is a discussion of the non-expert panelist demographic data results based on age-based interpretation of experiment P1 see the Table 1.

Table 1. Age-based interpretation of experiment P1

Age	Count of WP1	Average of WP1	Average of TP1	Average of RP1	Average of AP1
30 – 39	1	3.00	3.00	3.00	3.00
40 – 49	1	3.00	3.00	3.00	3.00
50 – 60	1	3.00	3.00	3.00	3.00
Grand Total	**3**	**3.00**	**3.00**	**3.00**	**3.00**

From the data above, it can be said that in the P1 experiment, non-expert panellists in the age range 50-59 years preferred it more. It is suspected that in the first experiment the highest non-expert panellists aged 20-29 years consisting of 21 people liked the most based on all aspects and the lowest scores were from panellists aged 15-19 years. It is suspected that panellists aged 15-19 years did not like experiment P1 because the colour was not good. The following is a discussion of the non-expert panellist demographic data results based on age-based interpretation of experiment P2 see the Table 2.

Table 2. Age-based interpretation of experiment P2

Age	Count of WP2	Average of WP2	Average of AP2	Average of TP2	Average of RP2
30 – 39	1	3.00	3.00	3.00	3.00
40 – 49	1	3.00	2.00	2.00	2.00
50 – 60	1	3.00	3.00	3.00	3.00
Grand Total	**3**	**3.00**	**2.67**	**2.67**	**2.67**

From the data above, it can be said that in the P2 experiment, non-expert panellists in the age range of 40-49 years were preferred. This is thought to be more suitable for them from all aspects, while the lowest score was obtained by the panel list aged 15-19 years. This is also thought to be because they prefer a sweeter taste and stronger aroma. The following is a

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discussion of the non-expert panellist demographic data results based on age-based interpretation of experiment P3 see the Table 3.

Table 3. Age-based interpretation of experiment P3

Age	Count of WP3	Average of WP3	Average of AP3	Average of TP3	Average of RP3
30 – 39	1	3.00	3.00	3.00	4.00
40 – 49	1	2.00	2.00	2.00	2.00
50 – 60	1	2.00	3.00	2.00	2.00
Grand Total	**3**	**2.33**	**2.67**	**2.33**	**2.67**

From the data above it can be said that in the P3 experiment the non-expert panellists in the age range 20-29 did not like the colour and taste aspects of the P3 experiment, while in the 50-59 year age range the non-expert panellists liked all aspects of the P3 experiment.

3.1. Non-Expert Panellist Demographic Results Data

The following is a discussion of the demographic data results of non-expert panellists based on age-based interpretation of experiment P1 see the Tabel 4.

Table 4. Age-based interpretation of experiment P1

Age	Count of WP1	Average of WP1	Average of AP1	Average of TP1	Average of RP1
15 – 19	1	2.00	3.00	3.00	3.00
20 – 29	21	3.00	3.14	3.33	3.14
30 – 39	2	3.00	3.00	3.50	3.00
40 – 49	5	3.20	3.20	3.20	3.20
50 – 59	1	4.00	3.00	4.00	4.00
Grand Total	**30**	**3.03**	**3.13**	**3.33**	**3.17**

From the data above, it can be said that in the P1 experiment, non-expert panellists in the age range 50-59 years preferred it more. It is suspected that in the first experiment the highest non-expert panellists aged 20-29 years consisting of 21 people liked the most based on all aspects and the lowest scores were from panellists aged 15-19 years. It is suspected that panellists aged 15-19 years did not like experiment P1 because the colour was not good. The following is a discussion of the non-expert panellist demographic data results based on age-based interpretation of experiment P2 see the Table 5.

Table 5. Age-based interpretation of experiment P2

Age	Count of WP2	Average of WP2	Average of AP2	Average of TP2	Average of RP2
15 – 19	1	3.00	3.00	3.00	3.00
20 – 29	21	3.10	3.57	3.14	3.67
30 – 39	2	3.00	4.00	3.50	3.50
40 – 49	5	3.60	3.40	3.40	3.80
50 – 59	1	3.00	3.00	4.00	4.00
Grand Total	**30**	**3.17**	**3.53**	**3.23**	**3.67**

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From the data above, it can be said that in the P2 experiment, non-expert panellists in the age range of 40-49 years were preferred. This is thought to be more suitable for them from all aspects, while the lowest score was obtained by the panel list aged 15-19 years. This is also thought to be because they prefer a sweeter taste and stronger aroma. The following is a discussion of the non-expert panellist demographic data results based on age-based interpretation of experiment P3 see the Table 6.

Table 6. Age-based interpretation of the P3 experiment

Age	Count of WP3	Average of WP3	Average of AP3	Average of TP3	Average of RP3
15 – 19	1	3.00	4.00	3.00	2.00
20 – 29	21	2.81	3.48	3.00	2.62
30 – 39	2	3.50	3.00	3.50	2.50
40 – 49	5	3.00	3.00	2.80	2.80
50 – 59	1	3.00	3.00	3.00	3.00
Grand Total	**30**	**3.90**	**3.37**	**3.00**	**2.63**

From data above it can be said that in the P3 experiment the non-expert panellists in the age range 20-29 did not like the colour and taste aspects of the P3 experiment, while in the age range 50-59 years the non-expert panellists liked all aspects of the P3 experiment.

3.2. Discussion of Data Processing Results

The following are the conclusions from processing data from the product "Adding Jackfruit in Making Choux Paste" see the Table 7. In making Choux Paste products with the additional ingredient of jackfruit, conclusions were drawn based on questionnaire data obtained from three expert panellists, using four sensory aspects: colour, aroma, texture, and taste across three experimental formulations (P1, P2, and P3). For the colour aspect, the total average score across the three formulations was 2.7, indicating a tendency toward liking. For aroma, the average score was 2.9, for texture it was 3.0, and for taste, it was also 3.0, all of which fall under the "liked" category on the hedonic scale.

These findings are consistent with previous research that shows the inclusion of tropical fruits like jackfruit can positively influence consumer perception in terms of flavour and aroma when appropriately formulated (Susanto & Damayanti, 2020; Herlina et al., 2023; Fitria et al., 2021). The use of trained or expert panellists is also standard in initial product acceptability testing as they can evaluate subtleties in sensory properties (Meilgaard et al., 2016; Stone & Sidel, 2020). From the overall data, the total score for all expert evaluations was 32.7, which falls under the “Like” category. However, the lowest score was found in the Taste aspect of formulation P3 (with 100% jackfruit), scoring 2.4, categorized as "tend to dislike". Conversely, the highest score of 3.0 was observed in all aspects for formulation P1 (with 50% jackfruit), suggesting optimal acceptability.

Further testing with 30 non-expert panellists (general consumers) was also conducted using the same four aspects: colour, aroma, texture, and taste across the same three formulations (P1–P3), as shown in Table 8. Non-expert panel data is essential to evaluate consumer acceptability and market feasibility (Lawless & Heymann, 2010; Andarwulan et al., 2022). The combined data reinforces that formulation P1 with 50% jackfruit was the most favored across both expert and non-expert evaluations.

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Table 7. Conclusions from Questionnaire Results for Products Adding Jackfruit in Making Choux Paste Expert Panellists

Test	Dimensions	Total Score	Mean	Median	Mode	Standard Deviation
P1	Color	3,0	3,0	3	3	0,00
	Aroma	3,0	3,0	3	3	0,00
	Texture	3,0	3,0	3	3	0,00
	Flavor	3,0	3,0	3	3	0,00
P2	Color	3,0	3,0	3	3	0,00
	Aroma	2,67	2,67	3	3	0,47
	Texture	2,67	2,67	3	3	0,47
	Flavor	2,67	2,67	3	3	0,47
P3	Color	2,33	2,33	2	2	0,47
	Aroma	2,67	2,67	3	3	0,47
	Texture	2,33	2,33	2	2	0,47
	Flavor	2,4	2,4	2	2	0,94
Total		**32,74**	**32,74**	**33**	**33**	**3,76**
Average		**2,7**	**2,7**	**3**	**3**	**0,31**

In making Choux Paste products with the addition of jackfruit, conclusions were derived from questionnaire data involving 30 non-expert panellists (general consumers). The evaluation used four hedonic sensory aspects: colour, aroma, texture, and taste, assessed across three experimental formulations (P1, P2, and P3). The total average score for the colour aspect across all formulations was 3.2, indicating a tendency toward “Like.” Similarly, the aroma aspect also received an average score of 3.2, while both texture and taste aspects received scores of 3.0, all categorized as “tending to like.” This aligns with standard sensory evaluation scales, where scores of 3.0 and above typically fall into the positive preference range (Meilgaard et al., 2016; Lawless & Heymann, 2010).

The overall total score of the questionnaire was 37.8, placing the product into the “Like” category. However, the lowest individual indicator was found in the Taste aspect for formulation P3, which scored 2.7, categorized as “Neutral to Slightly Dislike.” In contrast, the highest score was recorded in the Aroma aspect of formulation P2, scoring 3.5, suggesting a strong positive response in terms of aroma. These findings support previous studies indicating that moderate incorporation of tropical fruit ingredients like jackfruit can enhance product aroma and visual appeal, but excessive usage may alter the taste profile in ways that reduce consumer preference (Susanto & Damayanti, 2020; Fitria et al., 2021; Andarwulan et al., 2022). Based on the consumer preference test results, it was evident that formulation P2 was the most favored among the three, indicating that the optimal proportion of jackfruit addition is found in this formulation. This is consistent with findings that balance in flavor integration is key to maximizing consumer acceptability in innovative bakery products (Stone & Sidel, 2020; Utami et al., 2023).

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Table 8. Conclusion of Product Questionnaire Results Adding Jackfruit to Making Choux Paste Non-Expert Panellists

Test	Dimensions	Total Score	Mean	Median	Mode	Standard Deviation
P1	Color	3,1	3,1	3	3	0,63
	Aroma	3,1	3,1	3	3	0,34
	Texture	3,4	3,4	3	3	0,48
	Flavor	3,2	3,2	3	3	0,42
P2	Color	3,2	3,2	3	3	0,65
	Aroma	3,5	3,5	4	4	0,50
	Texture	3,2	3,2	3	3	0,37
	Flavor	3,2	3,2	4	4	0,46
P3	Color	2,9	2,9	3	3	0,57
	Aroma	3,3	3,3	3	3	0,46
	Texture	3,0	3,0	3	3	0,37
	Flavor	2,7	2,7	3	3	0,60
Total		**37,8**	**37,8**	**38**	**38**	**5,85**
Average		**3,2**	**3,2**	**3**	**3**	**0,48**

4. CONCLUSION

Based on the results of research conducted by the author entitled "Adding Jackfruit in Making Choux Paste" the following results were obtained: 1) Based on the results of experiments carried out by the author, it can be concluded that jackfruit can be added to making choux paste from the aspects of colour, aroma, texture, and taste. 2) Based on the results of research carried out by the author by distributing questionnaires to test preferences for experimental products, it can be concluded that the formulation preferred by both expert and non-expert panellists in terms of colour, aroma, texture and taste is the P2 formula, because this formula is superior to in terms of colour, aroma, texture and taste from other formulations. 3) The public's acceptance of this experimental Choux Paste has been very good, especially for the P2 formula. This can be seen from the good response from the public to this experimental Choux Paste considering that very few people use jackfruit in making cakes.

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