Development of Mango-Based Cake and Juice Products Fragrant Manis to Support Msmes at Polytechnics Syed Sirajuddin Malaysia

Elfitra Desy Surya, Sri rahayu, rashdan bin rashid,Winda Chairany

Abstract

The development of cake and juice products made from Harum Manis mangoes aims to increase the added value of mango fruits and support the development of MSMEs in the Tuanku Syed Sirajuddin Polytechnic, Malaysia. Harum Manis has a distinctive taste and aroma that has the potential to be used as the main ingredient in various processed products. Development is carried out by processing mangoes into cake and juice products, then paying attention to aspects of raw material quality, processing processes, cleanliness, packaging, and marketing opportunities. This activity can also be a means of entrepreneurial learning for students, especially in developing product ideas, recognizing consumer needs, and understanding the production and marketing process. The products produced are expected to have consistent quality and taste, attractive packaging, and prices that are in accordance with the market. The development of this product has the potential to expand the use of Harum Manis mangoes, encourage student creativity, and open up business opportunities in the polytechnic environment. Business sustainability needs to be supported by the evaluation of recipes and consumer responses, recording costs and sales, and the right promotional strategy.

***Keywords**:* Sweet Fragrant Mango, cake, Juice, Product Development, MSMEs

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Introduction

Mango is one of the tropical fruits that is widely liked because it has a sweet taste, distinctive aroma, and can be consumed directly or processed into various food products (Jerez, 2023). One variety that is known to have these characteristics is Sweet Fragrant Mango. This fruit has the potential to be developed as a raw material for processed products because its taste is easy to combine with various types of food and beverages. In addition to providing a natural taste and aroma, (Zhang et al., 2026) the use of mangoes can also be a special attraction for consumers who like fruit-based products (Hu et al., 2026; Pascual & Benito, 2025; Yue & Maggie, 2026; Zulqarnain & Liu, 2025).

Although it can be consumed directly, the use of mangoes in the form of fresh fruit has a number of limitations. Fresh fruits can deteriorate after harvesting (Yingwei Yan, 2020), especially if they are not handled and stored properly. When the number of fruits available is more than the demand, some mangoes are at risk of not being utilized to the fullest. Therefore, processing into food products can be one way to expand the use of mangoes and increase the use value of these raw materials. Processing also allows mangoes to be served in a more diverse and practical form for dikonsumsi(Abigail et al., 2024; Agag et al., 2024; Bujang & Bakar, 2023; Hsu, 2023; Nugraha et al., 2022; Qi et al., 2023; Shamim et al., 2024).

Diversification of mango-based foods can be done through the manufacture of various products, including cakes and juices. Cakes made from Sweet Fragrant Mango can be developed by utilizing fruit pulp as a mixture ingredient, filling, topping, or flavoring agent. The combination of sweet taste and mango aroma with cake ingredients can produce products that have a different character from cakes in general (Ong et al., 2024). The type, shape, taste, and presentation of products can be adjusted to the needs and preferences of potential consumers. This development provides space to produce a variety of products without losing the characteristics of the main ingredients (Yeo et al., 2016).

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Micro, small, and medium enterprises (MSMEs) have a role in developing products that are close to the needs of the community and utilizing available raw materials. Innovation in food processing can help MSMEs offer a more diverse selection of products (Bruckberger et al., 2023; Delgado-Ballester & Fernandez-Sabiote, 2024; Muenzer et al., 2022; Said et al., 2014). The processing of sweet fragrant mango into cakes and juice is an example of an effort to create added value through product development. If developed with good planning, this activity can be the first step to introduce the entrepreneurial process, starting from determining products, conducting production, calculating material needs, to considering marketing strategies (Li et al., 2024; Osuna Ramírez et al., 2024; Shamah et al., 2018).

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conducting production, calculating material needs, to considering marketing strategies (Li et al., 2024; Osuna Ramírez et al., 2024; Shamah et al., 2018).

This activity can also be a means to connect knowledge with application. Knowledge about food ingredients and processing processes can be used to produce more planned products. On the other hand, an understanding of entrepreneurship can help participants see processed products as opportunities that can be developed. Thus, the activity focuses not only on making cakes and juices, but also on the process of recognizing the potential of products and considering ways to make them have value for consumers (Ambali & Bakar, 2014; Cankül et al., 2024; Henderson, 2016; Ratanamaneichat & Rakkarn, 2013; Slamet et al., 2022; Xu et al., 2023; Zhang et al., 2023).

However, the development of products made from Sweet Fragrant Mango needs to pay attention to a number of challenges. The quality of raw materials can affect the taste and texture of the final product. A less consistent processing process can lead to difference in results, while unhygienic handling can reduce quality products. In addition, a good product in terms of taste still needs to be accompanied by packaging, presentation, and price that is in accordance with potential consumers. Therefore, product development needs to be carried out by paying attention to quality and consumer acceptance as a whole (Aziz et al., 2023; Gazi et al., 2024; Ghazali et al., 2022; Robertson et al., 2022).

Based on this description, the development of cake and juice products based on Mango Harum Manis is a relevant activity to support the development of MSMEs at the Tuanku Syed Sirajuddin Polytechnic Malaysia (Meyer-Waarden et al., 2023). This diversification is expected to expand the use of mangoes, produce attractive alternative food products, and increase understanding of the process of developing processed food-based businesses. With planned processing and attention to product quality, Mango Harum Manis has the opportunity to be developed into a value-added product that can be introduced to the public and considered as a business opportunity (Ambali & Bakar, 2014; X. Chen et al., 2023; Nguyen, 2024; Puspitasari et al., 2023).

Literature Review

2.1 Sweet Fragrant Mango as a Food Ingredient

Mango is a tropical fruit that can be consumed fresh or processed into various food products. One of the widely known varieties is Sweet Fragrant Mango, which has a distinctive aroma and sweet taste. Its taste and aroma characteristics make this mango have the potential to be used as an ingredient in food and beverage products (Aslan, 2023).

The use of mangoes as processed raw materials can expand the way of fruit consumption and increase the use value of foodstuffs. Processing fruit into other products also provides an opportunity to utilize mangoes that are available in large quantities. However, the quality of processed products is still influenced by the condition of the raw materials, such as the level of ripeness, freshness, and how they are handled. Therefore, the selection of suitable mangoes is an important stage before the production process is carried out (Agarwal & Dhingra, 2023; Al-Ansi & Han, 2019; Chou et al., 2023; Ismail et al., 2016).

Food Product Diversification

Food diversification is an effort to develop a variety of products or forms of consumption from available food. In the context of mango processing, diversification can be carried out by processing fruit into food and beverages, such as cakes and juices. The development of these products allows one type of raw material to be used in different forms according to the characteristics and needs of consumers.

Diversification can also be part of product innovation. Innovation can be done in recipes, taste, shape, size, presentation, and packaging. The goal is to produce products that have

distinctive characteristics and are attractive to consumers. In its implementation, product development needs to pay attention to the quality of ingredients, food safety, process consistency, and product suitability with market tastes (Aslan, 2023; Jamal & Sharifuddin, 2015; Kurniawati & Cakravastia, 2023; Lin et al., 2024; Nugraha et al., 2022).

2.2 Mango-Based Cake

Cakes are food products that are made through the processing of various ingredients, such as flour, sugar, eggs, and other additives. Mangoes can be used in making cakes as a mixing ingredient, filling, topping, or flavoring. The use of mangoes can produce a variety of flavors and aromas that distinguish the product from ordinary cakes.

The development of mangoes cakes needs to pay attention to the balance of the composition of the ingredients. The moisture content and ripeness level of the fruit, for example, can affect the texture of the dough and the final result. Therefore, recipes and processing techniques need to be adjusted to keep the taste, texture, and appearance of the product good. Presentation and packaging can also affect the attractiveness of the product when it is offered to consumers (Kulikovskaja et al., 2023).

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2.4 Food Quality and Safety

The quality of food products can be seen from several aspects, including taste, aroma, texture, color, appearance, and cleanliness. In processed mango products, the quality of raw materials and process consistency are important factors because both can affect the final result. The use of fresh ingredients, clean equipment, and organized processing stages help maintain product quality (Battiston et al., 2021; Hsu, 2023; Ismail et al., 2016; Roy et al., 2023).

Food safety also needs to be a concern in the production process. Good hygiene practices include the cleanliness of materials, equipment, processing sites, and people handling food. Proper handling and storage of products helps maintain the condition of the product before it is consumed or marketed. Attention to food quality and safety is important to build consumer trust (Gazi et al., 2024).

2.5 Development of MSMEs Based on Processed Products

Micro, small, and medium enterprises (MSMEs) can develop their businesses through the use of raw materials and the creation of products that have added value. The processing of sweet fragrant mango into cakes and juice is one example of developing food-based products. Processed products can provide alternatives for consumers while opening up business opportunities that can be further developed (Petelos et al., 2025).

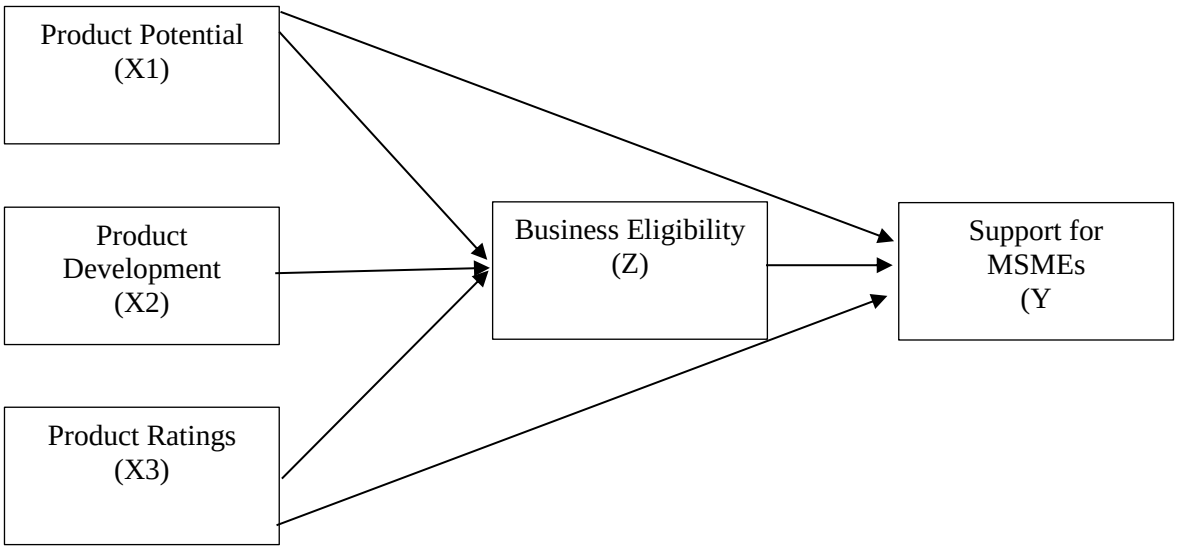
The development of MSMEs is not only determined by the ability to produce products. Business actors also need to consider pricing, packaging, promotion, and consumer targets. A clear product identity and attractive presentation can help products be easier to recognize. In addition, evaluation of consumer responses can be used as material to improve taste, quality, and marketing methods (Sudarma IM1, 4*, Yuarini DAA2, 4, Sukendar NMC1, 4 & Arisena GMK1, 4, Dewi NLMIM1, 4 and LDR Fajarini3, 2026).

2.6 Entrepreneurship Education in the Polytechnic Environment

Polytechnics have a role in developing practical knowledge and skills. Processing food into value-added products can be a means of entrepreneurial learning, as participants are involved in processes related to product planning, production, and introduction. These activities provide an opportunity to connect processing skills with an understanding of business opportunities. (Dos Santos et al., 2024; Mahrinasari et al., 2024; Trenggono et al., 2022; Vecchio et al., 2024)

The development of cake and juice products made from Sweet Fragrant Mango at the Tuanku Syed Sirajuddin Polytechnic Malaysia can provide practical experience on food utilization and product development. This activity can also encourage participants to understand that a product needs to be designed with quality, safety, attractiveness, and consumer needs in mind (Gao & Shen, 2024; Juhaidi et al., 2024b; Osorio et al., 2023b; Robertson et al., 2022; Troiville, 2024; Vu et al., 2024; Wang et al., 2024; Yanan et al., 2024; Zhao et al., 2024).

Research Conceptual Framework



Conceptual Framework of the Researcher

Hipotesis Penelitian

H1 : Product potential has a positive and significant effect on business feasibility
H2 : Product development has a positive and significant effect on business feasibility
H3 : Product assessment has a positive and significant effect on business feasibility
H4 : Business feasibility has a positive and significant effect on support fo MSMEs
H5 : Product potential has a positive and significant effect on support for MSMEs
H6 : Product development has a positive and significant effect on support for MSMEs
H7 : Product assessment has a positive and significant effect on support for MSMEs

H8 : Product potential has a positive and significant effect on support for MSMEs through business feasibility
H9 : Product development has a positive and significant effect on support for MSMEs through business feasibility
H10: Product assessment has a positive and significant effect on support for MSMEs through business feasibility

Research Methodology

3.1 Research Location and Research Time

This study will be conducted in Perlis, Malaysia and Medan City. The population in this study is foreign tourists who visit Perlis, Malaysia, and Medan City. Samples were taken using an accidental sampling technique, which is a method of selecting respondents based on their availability during the study. Data collection was carried out using a questionnaire arranged based on the dimensions or indicators of each research variable**.** The sampling technique in this study uses objective sampling techniques. Sampling is objective, i.e. the selection of respondents based on certain criteria, such as: tourists visiting Perlis Malaysia. It has used AI-based applications (such as AI chatbots, system recommendations, or AI analytics for marketing). Referring to Hair et al. (2014), respondents were asked to answer questions based on their experiences and perceptions of the variables studied, so that the results obtained can describe the actual conditions. The sample obtained was 250 respondents.

3.2 Research Data Sources

Primary Data, The main data in this study was obtained from the results of the processing of research questionnaires distributed based on the preferences and perceptions of tourists in Perlis Malaysia.

3.3 Variable Measurement Scale

In this study, the Likert scale was used to measure all variables that are respondents of perception and attitude towards the use of AI. This scale is best suited because it allows the measurement of attitudes from ordinal to interval through statements that describe respondents' level of approval or disagreement with a statement

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No.	Scale	Rekor
1.	Strongly Agree	5
2.	Agree	4
3.	Disagree	3
4.	Not Disagree	2
5.	Strongly disagree	1

Source: Processed by Researchers (2025)

Data Collection Techniques

In this study, a quantitative approach was used to test the relationships between variables using the Pathway Analysis technique. Therefore, the selected data collection technique should support the quantification of respondents' perceptions.

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Results

4.1 Respondent Characteristics

Table 1 . Characteristics of Respondents

Characteristics	Pilihan		Responden	
			N	%
		Length of Involvement		
Gender	Male		54	54
	Female		46	46
Age	16-25		28	28
	26-35		32	32
	36-45		24	24
	37-45		10	10
	>45		6	6
Education	SD/Equivalent		8	8
	SMP/ Equivalent		14	14
	SMA/ Equivalent		38	38
	Diploma/Bachelor's Degree		34	34
	Post Graduate		6	6
Engagement in Tourism	15	< 1 tahun	15	15
	33	1–3 tahun	33	33
	29	4- 6 tahun	29	29
	23	> 6 tahun	23	23

Based on Table 1, it is known that most of the respondents are male as many as 54 respondents (54%), while female respondents are 46 respondents (46%). This composition shows that the activity of selling juice from sweet fragrant mango in Perlis is very supportive of the community's economy involving people from various gender groups in a relatively balanced

manner. Based on age characteristics, the majority of respondents are in the age group of 26-35 years as many as 32 respondents (32%), followed by the age group of 17-25 years as many as 28 respondents (28%). This condition shows that most of the respondents are at a productive age who have the ability to adapt

Based on the level of education, the majority of respondents have high school/equivalent education as many as 38 respondents (38%), then diploma/bachelor education as many as 34 respondents (34%). This shows that respondents have a sufficient level of education to understand the concept of MSME development for sweet fragrant mango juice entrepreneurs.

Based on the length of involvement, most of the respondents have been active in the tourism sector for 1-3 years as many as 33 respondents (33. Based on the length of involvement, most of the respondents have been active in the tourism sector for 1-3 years as many as 33 respondents (33%). This shows that the respondents have sufficient experience in the development of MSMEs.

4.2 Convergent Validity Test

The convergent validity was evaluated through the outer loading value of each indicator and the Average Variance Extracted (AVE) value of each construct. An indicator was declared to be convergently valid if the outer loading ≥ 0.70, and the construct met the convergent validity if the AVE value was ≥ 0.50 (Hair et al., 2019). The test results are presented in Table 2.

Table 2. Outer Loadings Test Results

Construct	Indicator	Outer Loading	Remarks
Product Potential (X1)	X1		
	X1.1	0,857	Valid
	X1.2	0,815	Valid
	X1.3	0,824	Valid
	X1.4	0,818	Valid
Product Development (X2)	X2		
	X2.1	0,851	Valid
	X2.2	0,787	Valid
	X2.3	0,810	Valid
	X2.4	0,813	
Product Ratings (X3)	X.3		
	X.3.1	0,817	Valid
	X.3.2	0,830	Valid
	X.3.3	0,814	
Business Eligibility (Z)	Z		
	Z1.1	0,846	Valid
	Z1.2	0,793	Valid
	Z1.3	0,859	Valid
	Z1.4	0,798	Valid
Support For UMKM (Y)	Y		
	Y1.1	0,836	Valid
	Y1.2	0,794	Valid
	Y1.3	0,818	Valid

Based on Table 2, all indicators from the five constructs have an outer loading value ranging from 0.758 to 0.882, and all are above the limit value of 0.70. Thus, all indicators are declared to be convergently valid and eligible for use in further analysis.

4.3 Construct Reliability and Validity Test

Construct reliability was measured using Cronbach's Alpha (α), Composite Reliability (ρa and ρc), and Average Variance Extracted (AVE). Cronbach's Alpha and Composite Reliability values above 0.70 indicated adequate reliability, while AVE ≥ 0.50 indicated good convergent validity (Fornell & Larcker, 1981; Hair et al., 2019). The test results are presented in Table 3.

Tabel 3. Construct Reliability and Validity

Construct	Cronbach's Alpha (α)	rho_a (ρa)	Composite Reliability (ρc)	AVE
Product Potential (X1)	0,883	0,884	0,914	0,680
Product Development (X2)	0,888	0,835	0,889	0,667
Product Ratings (X3)	0,886	0,887	0,914	0,682
Business Eligibility (Z)	0,885			
Support for MSEsM (Y)	0,880	0,884	0,912	0,675
Limit Value	≥ 0,70	≥ 0,70	≥ 0,70	≥ 0,50

Table 3 shows that the entire construct has Cronbach's Alpha values between 0.880 to 0.888, Composite Reliability (ρc) between 0.889 to 0.914, and AVE between 0.667 and 0.682. All of these values are above the required threshold, so it can be concluded that the entire construct has met the criteria of good convergent reliability and validity.

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Table 4. Heterotrait-Monotrait Ratio (HTMT)

Construct	X1	X2	X3	Y	Z
Product Potential (X1)	-				
Product Development (X2)	0,347	-			
Product Ratings (X3)	0,549	0,412	0,536	-	
Business Eligibility (Z)	0,581	0,562	0,519	0,703	
Support For UMKM	0,582	0,564	0,520	0,796	0,792

Remarks: The entire HTMT value is below 0.347 (highest value: Z ↔ Y = 0.796), so the discriminant validity is met.

Table 5. Kriteria Fornell-Larcker

Construct	X1	X2	X3	Y	Z
Product Potential (X1)	0,825				
Product Development (X2)	0,301	0,817			

Product Development (X3)	0,490	0,357	0,479		
Business Eligibility (Z)	0,515	0,484	0,472	0,624	
Support for MSMEs	0,515	0,486	0,479	0,638	0,826

4.4 R-Square Analysis

Before entering the analysis of the structural model (inner model), an evaluation was carried out on the value of the determination coefficient (R-Square / R^2). The R^2 value measures how much variation of endogenous variables can be explained by exogenous variables in the model. Hair et al. (2019) classified R^2 as 0.75 as substantial, 0.50 as moderate, and 0.25 as weak.

Tabel 6. Hasil Analisis R-Square

Category	R-Square (R^2)	R-Square Adjusted	Category
Business Eligibility (Z)	0,475	0,468	Moderate
Support for MSMEs (Y)	0,470	0,463	Moderate

Based on Table 5, the business feasibility variable (Z) has an R^2 value of 0.475, meaning that 47.5% of the variation in business feasibility can be explained by the variables of product potential (X1), Product development (X2), The support variable for MSMEs (Y) has an R^2 value of 0.470, meaning that 47.0% of the variation can be explained by X1, X2, and Z together. The two R^2 values are included in the moderate category, showing that the model has a fairly good predictive power in explaining the variability of endogenous variables.

4.5 Model Feasibility Test (Model Fit)

Model feasibility was assessed using SRMR (Standardized Root Mean Square Residudual) and NFI (Normed Fit Index). An SRMR of < 0.08 indicates a fit model (Hu & Bentler, 1999), and an NFI close to 1.0 indicates a good model fit. The test results showed SRMR values of 0.056 (saturation model) and 0.057 (estimation model), both below the limit value of 0.08. An NFI value of 0.864 indicates tingkat kelayakan model yang dapat diterima. Thus, the structural model in this study has an adequate goodness-of-fit.

Structural Model Evaluation (Inner Model) and Hypothesis Testing

The structural model evaluation was carried out to test the relationship between latent variables and test the research hypothesis. This analysis included testing direct effects, indirect effects (mediation) through the Corridor 2026 (Z) variables, and total overall effects. The results of path coefficients analysis are presented in Table 6.

a) Direct Effect

Table 7. Direct Influence Path Coefficient

Hipotesis	Path	Path Coefficients (β)	T Statistik	P Value	Remarks
H1	Product Potential (X1) → Business Eligibility (Z)	0,226	4,299	0,000	Signifikan
H2	Product Development (X2) → Business Eligibility (Z)	0,342	6,517	0,000	Signifikan

H3	Product Ratings (X3) → Business Eligibility (Z)	0,309	6,184	0,000	Signifikan
H4	Eligibilitya (Z) → Support for MSMEs (Y)	0,235	4,235	0,000	Signifikan
H5	Product Potential (X1) → Support for MSMEs (Y)	0,315	6,375	0,000	Signifikan
H6	Product Development (X2) → Support for MSMEs (Y)	0,317	6,378	0,000	Signifikan
H7	Product Ratings (X3) → Support for MSMEs (Y)	0,319	6,79	0,000	Signifikan

Table 7 shows that all direct influence pathways have a path coefficient (β) of positive and statistically significant value ($p < 0.001$). Business feasibility (Z) has the largest direct influence on Support for MSMEs (Y) with $\beta = 0.235$ ($T = 4.235$; $p = 0.000$), followed by product potential (X1) Support for MSMEs (X1 → Y) with $\beta = 0.315$ ($T = 6.375$; $p = 0.000$), (X3 → Z) with $\beta = 0.315$ ($T = 6.375$; $p = 0.000$), Product potential (X1) → business feasibility (Z), product development on business feasibility(X2 → Z) with $\beta = 0.309$ ($T = 6.184$; $p = 0.000$), (X3 → Y) with $\beta = 0.235$ ($T = 4.235$; $p = 0.000$), and product development (X2) → support for MSMEs (Y) (X1 → Y) with $\beta = 0.226$ ($T = 4.299$; $p = 0.000$).

b) Indirect Effect

Mediation effect testing was carried out to see if the business feasibility variable (Z) was able to mediate the influence of independent variables on support for MSMEs (Y). The results of specific indirect effects are presented in Table 8.

Tabel 8. In Direct Effect Support Of UMKM

Hypotesis	Mediation Pathway	Indirect Effect (β)	T Statistik	P Value	Conclusion
H8	Product Potential (X1) → support for MSMEs (Y) Through business feasibility (Z)	0,396	5,721	0,000	Signifikan
H9	Product Development (X2) → support for MSMEs (Y) Through business feasibility (Z)	0,398	5,723	0,000	Signifikan

H10	Product Ratings (X3) → support for MSMEs (Y) Through Business Eligibility (Z)	0,394	5,712	0,000	Signifikan

Remarks: All mediation effects are statistically significant ($p < 0.001$). X1 product potential does not have a direct path to Y, so business feasibility (Z) plays a role as full mediation (full mediation; T = 3.911; p = 0.000). X1 (T = 5.721 p = 0.000) and X2 and X3 (T = 4.018; p = 0.000) have direct or indirect paths to Y, so that business feasibility (Z) acts as partial mediation.

c) Total Effects

Table 9. Total Variable Effects on Support of MSMEs (Y)

Variable l	Direct Effects (β)	Indirect Effects (β)	Total Efek (β)
Product Potential (X1)	0,226	0,136	0,361
Product Development (X2)	0,228	0,123	0,123
Product Development (Z)	0,396	0,128	0,396

Tabel 10 merangkum seluruh hipotesis penelitian beserta koefisien jalur, efek mediasi, dan kesimpulan berdasarkan arah dan besaran pengaruh yang diperoleh dari hasil pengolahan Smar-tPLS 4.

Tabel 11. Ringkasan Hasil Pengujian Hipotesis

	Hypothesis	β	T Statistik	P Value	Conclusion
H1	Product Potential (X1) → Business Eligibility (Z)	0,226	4,299	0,000	Signfikan
H2	Product Development (X2) → Business Eligibility (Z)	0,342	6,517	0,000	Signfikan
H3	Business Eligibility (Z)(X3) → Feasibility of the venture (Z)	0,309	6,184	0,000	Signfikan
H4	Feasibility of the venture (Z) → Support for MSMEs (Y)	0,396	5,721	0,000	Signfikan

H5	Business Potential (X1) → Support for MSMEs (Y)	0,136	4,430	0,000	Signfikan
H6	Support for MSMEs (Y)(X2) → Support for MSMEs (Y)	0,123	3,911	0,000	Signfikan
H7	Product Ratings (X3) → MSME Support (Y)	0,125	4,018	0,000	Signfikan
H8	Business Potential (X1) → Support for MSMEs (Y) → Business Eligibility (Z)	0,128	4,019	0,000	Signfikan
H9	Pengembangan Produk (X2) → Product Development (Y) → Business Eligibility (Z)	0,129	4,010	0,000	Signfikan
H10	Product Ratings (X3) → MSME Support (Y) → Business Eligibility (Z)	0,130	4,013	0,000	Signfikan

Conclusion

The development of cake and juice products made from Harum Manis mango is a form of food processing innovation that can provide added value to local fruits. Harum Manis has a distinctive taste and aroma so that it has the potential to be processed into products that are attractive to consumers. By developing mangoes into cakes and juices, their use is not limited to the consumption of fresh fruit, but can also be expanded into processed products that have a variety of flavors, shapes, and ways of presentation.

This activity has the potential to support the development of MSMEs within the Tuanku Syed Sirajuddin Polytechnic, Malaysia. The product development process can be a means for students to learn entrepreneurship directly, starting from raw material selection, processing, packaging, to marketing. In addition, this activity can encourage creativity, cooperation, and student skills in creating products that suit consumer needs and interests.

Harum Manis mango cake and juice products also have the opportunity to be developed as superior products that have distinctive characteristics. However, the success of its development needs to be supported by consistent product quality, taste that suits consumer tastes, cleanliness and food safety, and attractive and practical packaging. Proper pricing and marketing strategies are also important so that products can compete and reach a wider market, both in the polytechnic environment and off-campus.

Overall, the development of cake and juice products made from Harum Manis mango can be the first step to build creative and productive business activities in the polytechnic environment. With continuous planning, management, and evaluation, this product is expected to increase the use value of mangoes, provide entrepreneurial experiences for students, and open up opportunities for the growth of competitive MSMEs.

Suggestions

In order for the development of Manis-based cake and juice products to run well and sustainably, the following things can be considered:

1. Maintaining the quality of raw materials Choose Manis Manis that is ripe, fresh, and suitable for consumption. The quality of raw materials affects the taste, aroma, color, texture, and durability of the product. If the business starts to develop, the availability of mangoes also needs to be planned, especially when the harvest amount changes or raw materials are difficult to obtain.

2. Testing and evaluating recipes Cake and juice recipes should be tested multiple times to obtain consistent ingredient composition and flavor. Trials can include sweetness, cake texture, juice consistency, serving size, and choice of additional ingredients. Feedback from students, staff, and potential consumers can be used to refine the product.
3. Paying attention to food hygiene and safety The entire process, from mango washing to processing and packaging, needs to be done hygienically. Equipment must be clean, materials stored properly, and products served or stored in appropriate conditions. This is important to maintain product quality and build consumer trust.
4. Gradually developing product variations Once the main product is accepted by consumers, the development of variations can be done gradually. For example, adding flavor or size options, making different types of cakes, or offering juices with a selectable level of sweetness. Each innovation should still maintain the distinctive flavor of Fragrant Mango.

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