



Exploring Consumer Preferences on Cucumber (*Cucumis sativus*) Varieties in Besut, Terengganu

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ABSTRACT

Cucumber (*Cucumis sativus* L.) agriculture production in Terengganu, Malaysia, could boost income due to widespread consumer demand and its nutritional value. Instead of merely cultivating and producing any variety of cucumber, this study looked at what purchasers genuinely want when deciding between three common cucumber varieties (*Timun Hijau*, *Timun Ulam* or *Timun Jepun*) in the Besut area. By verifying genuine options, it attempted to match supply with what consumers desire. The focus was on what makes someone prefer one variety of cucumber over another. Factors like taste, texture, appearance, price or if it is easy to find (availability) can impact decisions, but not much was understood before now. Without that intelligence, marketers and growers frequently guess wrong, which leads to unsold harvests stacking up. The main objectives of this study were to identify what attract consumers in cucumber varieties, measuring how much they prefer one variety over another, while also looking into reasons behind their choices. The study used a quantitative cross-sectional survey design (n=140), drawing on the Theory of Planned Behaviour (TPB) to construct its structure, focusing on individual perceptions impacted by sensory attributes (Taste, Texture, Appearance) and practical accessibility of Perceived Behavioural Control (PBC) through market factors (Price and Availability) of individuals living in Besut, Terengganu. A pilot study confirmed strong reliability, with Cronbach's alpha values exceeding 0.7 (the lowest was Appearance (0.731) and the highest was Price (0.906)) for all items (n = 20). The data were analyzed using IBM SPSS Statistics (Version 25), applying descriptive analysis, Pearson correlation and regression analysis. The overall multiple regression model was statistically highly significant with $[F(5, 134) = 12.506, p < 0.001]$, accounting for 31.8% of the variance in Consumer Preferences. However, hypothesis testing revealed a clear separation in predictive power. The factors representing PBC, which were Availability ($\beta=0.362, p=0.002$) and Price ($\beta=0.253, p=0.035$) emerged as the only statistically significant unique predictors. On the other hand, sensory traits like Taste, Texture or Appearance were not significantly influential in the final analysis, suggesting personal opinions on these features matter less compared to pragmatic factors. In Besut, purchasing decisions on cucumbers appeared to be influenced primarily by availability and accessibility, not necessarily their actual quality of the produce. As such, initiatives in biotechnology agriculture or regional farming may prove more effective if they concentrate on reliable distribution systems and consistent pricing, helping align supply with what consumers really respond to.

Keywords: Consumer preferences, cucumber varieties, market demand, consistent supply chain, Theory of Planned Behaviour, regression analysis

INTRODUCTION

The Cucurbitaceae family, which consists of watermelons, pumpkins, squashes and melons, also includes the fresh fruit vegetable cucumber (*Cucumis sativus* L.) (Sharma et al., 2020). This class of plants is predominantly cultivated and produced in Asia, and is thought to have originated in Asia, particularly on India's Himalayan slopes (Kaur & Sharma, 2022). There are over 100 varieties of cucumber exist globally (Akhtar et al., 2020). Cucumbers are a universally popular vegetable recognised for their refreshing flavour and versatility (Mallick, 2022). Cucumbers are cultivated mainly for two purposes which are for fresh consumption and processing. The diverse applications resulted in the emergence of specific market categories exhibiting different morphological characteristics, such as fruit size, skin colour and texture, firmness, crispness and flavour.

Cucumber is also an important vegetables crop species cultivated both in greenhouse and field in Malaysia. According to the Department of Agriculture Malaysia, cucumbers consistently rank among the top 10 most produced vegetables in the country (Jabatan Pertanian Malaysia, 2022). As outlined in the FAMA Standard (FS 009: 2023) by the Federal Agricultural Marketing Authority (FAMA), *Timun Hijau* and *Timun Jepun* are the two most commonly planted cucumber varieties in Malaysia (FAMA Standard, 2023). Particularly in Besut Terengganu, there are three varieties which is very popular like *Timun Hijau*, *Timun Jepun* and *Timun Ulam*.

These cucumbers are highly valued both as a food and in traditional medicine due to their excellent hydration qualities, low calorie content and advantageous flavour and texture. They have antioxidant, antimicrobial and glycaemic-lowering qualities and are frequently eaten fresh or in processed forms like pickles. Regular intake or applied treatment is believed to reduce skin ageing, improve metabolism and boost body immunity. Their soothing effects make them popular for relieving puffiness, irritation, sunburn, and inflammation (Sharma et al., 2020). Additionally, cucumbers contain cucurbitacin's, bioactive compounds that may help inhibit the growth and survival of cancer cells, highlighting their wider potential health benefits (Akhtar et al., 2020).

Consumer preferences are influenced by multiple factors, such as individual attitudes, demographics (including age, gender and income), cultural background and external elements such as societal pressures and product details (Jamuni & Halijol, 2025). These preferences are crucial when companies create products that genuinely engage with consumers, which builds trust while keeping satisfaction among consumers. The happiness of purchasers, referred to as utility, reflects their valuation of items depending on their needs or experiences (Du et al., 2022). Moreover, consumer purchasing decisions frequently hinge on their habits, social influences and perceived flexibility; hence, companies must accurately address these variables to fulfil genuine market demands.

The Theory of Planned Behaviour, commonly referred to as TPB, was used in this study to meet its objectives. This conceptual framework frequently arises when researchers explore human cognition on social behaviour. In 1986, Ajzen collaborated with Madden to develop the TPB, focussing on the relationship between purchasing intentions, personal beliefs, social influence and sense of control. A person's opinion on a product, what others expect, along with how much they feel in charge, altogether shape whether they will actually buy the product. Subjective norms, referred to as social influence, related to individuals' perceptions of others' opinions, such as conformity or social adherence, in which they do not simply indicate approval of a decision, rather they reflect whether an individual feel accepted by those around them. Factors such as social pressure, shared beliefs and group expectations can influence the formation of behaviours and individuals' intentions to behave in a particular manner. On top of that, the TPB gives a clear method for building effective strategies (Ajzen, 2020).

The three main parts; attitude, subjective norms and perceived behavioural control, aligned effectively with the focus of this study, which examined factors such as sensory attributes (Taste, Texture and Appearance) and market-related factors (Price and Availability). This TPB concept is applicable since the selection of products, such as cucumbers varieties, frequently relies on individuals' perceptions of the item's quality. Consumers' evaluations of flavour, freshness, surface texture and visual appeal distinctly indicate their preference for a specific variety of cucumber.

Recent studies used TPB to explore consumer decisions about the purchase of fruits and vegetables, revealing that favourable taste or aroma typically correlates with increased preference and purchase intent (Abduljawad et al., 2025). Nevertheless, the framework also highlights another aspect, in which the perceived behavioural control (PBC) over decisions, especially with regard to agricultural products at local markets. In this study, price and availability represent a sense of control. An individual may prefer a particular variety but opt for another if it is more accessible or less expensive. The TPB framework is particularly applicable to the investigation of products like vegetables, as factors such as consistent supply, market sales patterns and fluctuating prices really shape what people plan to do and actually end up doing (Aljehany et al., 2025). Researchers often use TPB when investigating food choices, as it considers not just individual preferences but also practical obstacles.

In locations such as Besut, where particular variety of cucumbers command more sales or maintains superior pricing, the TPB explains the rationale for consumers' preferences for one type while ultimately purchasing another based on optimal functionality. As shown in Fig. 1, the model outlines key elements associated to this research. The present study aimed to figure out the factors influencing individuals' purchases among various cucumber varieties. The factors addressed includes Taste, Texture, Appearance, Pricing and Availability, all of which having an impact on the primary outcome; Consumer Preferences.

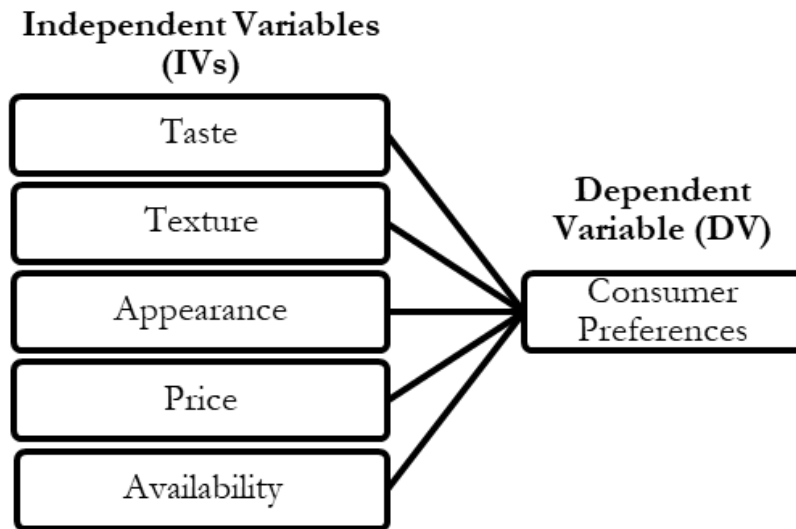


Fig. 1. Conceptual framework of consumer preferences on different types of cucumber varieties.

MATERIALS AND METHODS

Research Design

In order to determine the factors that influence consumer preferences for cucumber varieties, this study used a quantitative methodology. Quantitative research methods involve the gathering and analysing of numerical data to investigate correlations between variables. This approach allowed us to measure and analyse consumer preferences for different cucumber varieties (*Timun Hijau*, *Timun Ulam* and *Timun Jepun*) in Besut, Terengganu, and to identify the factors that have a major impact on those selections. A quantitative method is ideal for this study as our objective was to determine the critical factors that influence consumer preferences for cucumber varieties. We can statistically explore the correlations between various elements and consumer selections for cucumber varieties by gathering survey data from a sizable sample of consumers.

Population and Sampling Method

The target group of this study was adult consumers from Besut, Terengganu, who purchasing fresh produce regularly, and were at least 18 years old. Respondents were chosen according to their availability and willingness to participate, applying a convenient sampling method. Convenience sampling is affordable and suited for initial-stage studies in local areas, but we understood its constraints regarding broader application.

We employed non-proportional quotas to achieve a balanced distribution across relevant demographic variables in order to minimise potential sampling biases; this helped improved the final group's representation of the larger population. Fixed respondent numbers were assigned to specific category; in this case, age and gender, instead of matching real-region population ratios. Regardless of their actual proportions in Besut, the target was 70 males and 70 females, with a concentration on participants who were at least 18 years old. The minimum required sample size, determined using G*Power software (Faul et al., 2007) for a multiple regression analysis with a desired effect size, was calculated to be $n=138$. A total of 140 completed questionnaires were collected and used for the final analysis.

Instrument Development

The data was collected using a self-administered questionnaire, distributed both face-to-face and via an online survey platform (Google Forms) to ensure a wide reach among the target population. This survey comprised of five sections which were Section A (Respondent Profile), Section B (Consumer Preferences), Section C (Taste), Section D (Texture and Crispiness), Section E (Appearance), Section F (Price) and Section G (Availability). Section A, the respondent profile, was related to the respondents' demographic backgrounds. The demographic backgrounds of consumers related to age, gender, education level and occupation were obtained from this section. Furthermore, Section B of consumer preferences covers the consumers' familiarity for three types of cucumber varieties which were *Timun Hijau*, *Timun Jepun* and *Timun Ulam*. Moreover, in the Section C, Section D, Section E, Section F and Section G, the respondent had to answer five Likert scale questions based on taste, texture, appearance, price and availability as factors for consumer preferences on different types of cucumber varieties. All preference and factor items utilized a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree).

Reliability Test

A pilot test was conducted among 20 consumers to assess the instrument's clarity and reliability. The results, as detailed in Table 1, showed that the Cronbach's Alpha (α) values for all constructs in the final data collection ($n=140$) exceeded the minimum acceptable threshold of $\alpha > 0.7$ (Awang & Mohamad, 2016). For example, the values ranged from $\alpha = 0.848$ (Consumer Preferences) to $\alpha = 0.901$ (Taste), indicating strong internal consistency and reliability for all measurement scales. Sekaran (2003) defines reliability as the degree of reliable the question that is going to be asked to respondents in order to get consistent results. As for the pilot-test was conducted among the 20 respondents among the consumers, showing that the data were interpreted using reliability analysis. Hoque et al. (2018) recommended the minimum value for Cronbach Alpha is 0.7 is dependent on the number of items in the scale, showing that there is consistency among the questions. The higher the Cronbach's Alpha value, the better the questions constructed. The results of Cronbach's alpha (Table 1) showed a value over than 0.7 for all items in the questionnaire attribute, indicating that the consumers were able to answer and understand the questions. The number of construct item for both pilot test and data collection. The Cronbach Alpha value for independent variables component and the value exceed the minimum figure of 0.7 and can be utilized for the study (Awang & Mohamad, 2016; Hoque et al., 2018).

Table 1. The Cronbach's Alpha (α) values of the study instrument for pilot test and data collection.

Reliability Statistics				
Construct	Pilot Test (n = 20)		Data Collection (n = 140)	
	Item	Cronbach's Alpha	Item	Cronbach's Alpha
IV				
Taste	7	0.836	0.901	7
Texture	5	0.857	0.880	5
Appearance	5	0.731	0.898	5
Price	5	0.906	0.896	5
Availability	5	0.756	0.881	5
DV				
Consumer Preferences	6	0.710	0.848	3

Data Collection and Data Analysis

A total of 140 adult consumers from Besut, Terengganu participated in the survey. To address the study objectives, data analysis was performed using IBM SPSS Statistics (Version 25). Descriptive statistics (means, standard deviations and frequencies) were used to summarize the demographic profile and overall consumer familiarity and preference ratings for the cucumber varieties. One-way Analysis of Variance (ANOVA) were utilized to compare and identify statistically significant differences in the mean preference levels across the three cucumber varieties and Multiple Regression Analysis was employed to test the predictive power of the independent variables on consumer intention to select each specific cucumber variety.

RESULTS AND DISCUSSION

Descriptive statistics in SPSS were used to analyse the demographic characteristics of the Besut consumer respondents (n=140), as illustrated graphically in Fig. 2. The respondent profile, which included details like age, gender, occupation and educational level, was described using descriptive analysis.

Age and Gender Distribution

The sample exhibited a relatively young skew, with the largest proportion of respondents (33.6%, n=47) falling into the 18 to 25 years old age group. This was followed by the 26 to 33 years old group (20.0%, n=28) and the 34 to 41 years old group (19.3%, n=27). Consumers aged 42 and above collectively accounted for 27.2% of the total sample. Young consumers between the ages of 18 and 25 made up the majority of the sample. These matters, because, according to recent studies, younger consumers are prone to try a variety of produce and are more likely to consider overall appearance, colour and the freshness when making decisions about what to buy (Zhang et al., 2023).

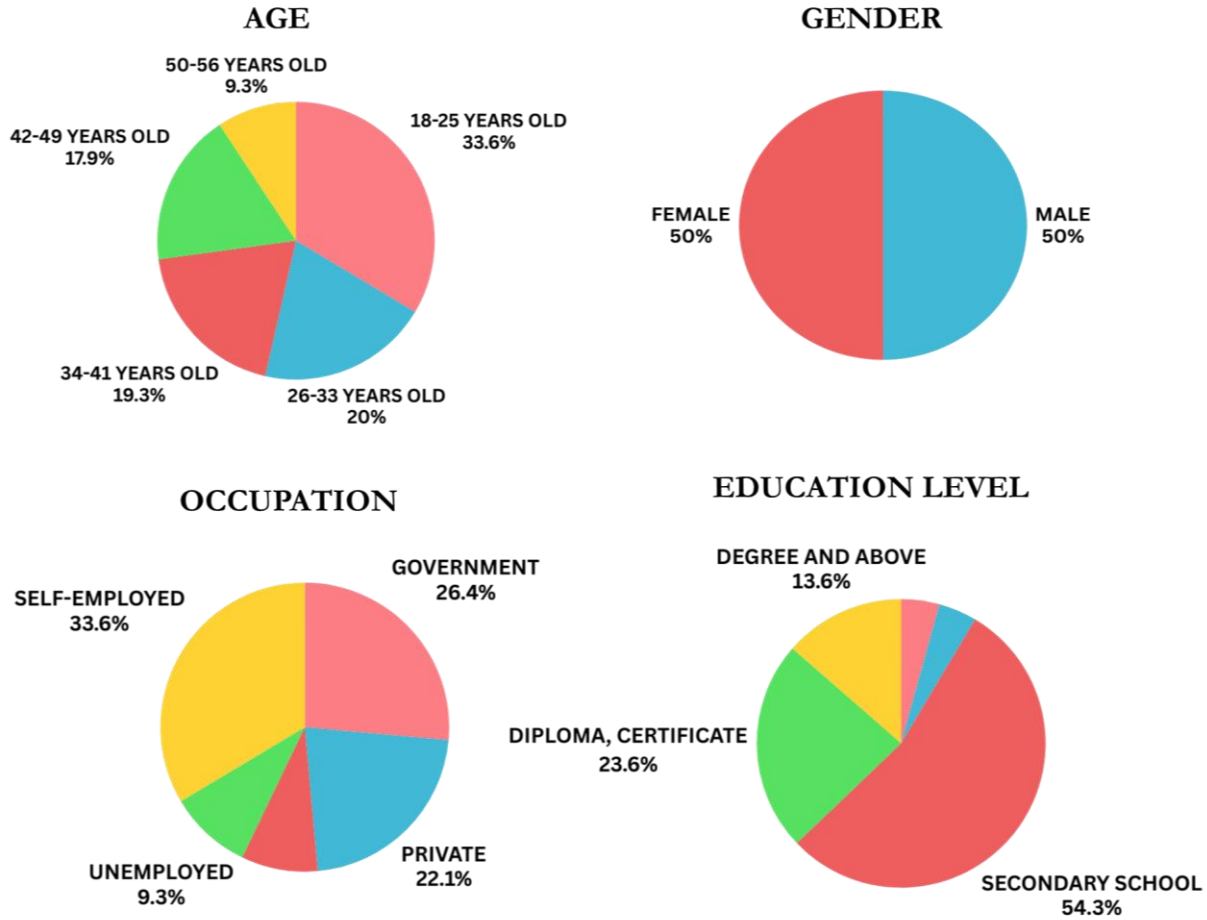


Fig. 2. Demographic profile of consumer respondents in Besut (n = 140).

Additionally, young people are more conscious of the importance of eating healthily and are more likely to go for produce that they believe are beneficial to their health (Rahman et al., 2024; Savelli & Murmura, 2023). Yet, studies showed that middle-aged and older consumers frequently prioritise familiarity, taste and regular purchasing patterns, therefore it is beneficial to include a reasonable percentage of these consumers in the sample (Carvalho et al., 2022).

Notably, the study's gender representation was precisely equal, with 50.0% of the sample being made up of male and female respondents (n=70 for each gender). A balanced perspective on cucumber preferences across genders is delivered by a comparable proportion of males and females, which further supports the results. Vegetable intake patterns are known to be influenced by gender differences. According to recent research, men are more likely to prioritise cost and convenience, whereas women often eat vegetables regularly and place a higher value on freshness and safety (Li & Wang, 2023; Feraco et al., 2024).

Occupational and Educational Background

Self-employed individuals made up the largest group in terms of occupational status, accounting for the majority proportion at 33.6% (n=47). Given the fact that small business owners often deal with fluctuating incomes and time constraints, the high percentage of self-employed individuals may have more flexible purchasing habits and may prioritise affordability and accessibility when choosing fresh produce (Tan & Abdullah, 2023). Employees

in the government sector (26.4%, n=37) ranked second, followed by those in the private sector (22.1%, n=31). The remaining 17.9% of the sample included both unemployed individuals and college students. Because of the varied occupations of the participants, the study was able to capture a variety of economic factors that may influence the choices of cucumbers.

In terms of education, secondary school was the most often reported educational level, possessed by 54.3% (n=76) of respondents. Respondents with a diploma or certificate made up 23.6% (n=33), whereas those with a degree or higher education made up 13.6% (n=19). Secondary school was the most common educational level stated, with 54.3% (n=76) of the participants indicating this. In the study, 23.6% of the participants (n=33) had a diploma or certificate, while 13.6% (n=19) had a degree or higher education.

Studies exhibited that consumers with higher levels of education are more likely to review product information prior to making a purchase. They also generally have a better understanding of food quality (Haryanto et al., 2023). Therefore, the participation of diploma and degree holders in the sample was beneficial, as they usually display a greater interest in healthy eating and a better responsiveness to product variety, including diverse vegetable varieties. A tiny minority had either no formal education (4.3%, n=6) or only completed primary school (4.3%, n=6). The sample appears to represent a wide range of consumer groups in the Besut region based on the diversity of educational and occupational backgrounds.

Consumer’s Preferences on Cucumber Varieties

In order to determine the consumer preferences on different cucumber varieties, the study used descriptive analysis to measure the dependent variable which was consumer preferences and five independent variables which were Taste, Texture, Appearance, Price and Availability factor. Overall, all of the statements stated the mean above 4.00 (using 5 Likert-like scale).

Pearson-Correlation Analysis

The Pearson-Correlation analysis served as an essential preliminary step in examining the relationships between consumer preferences for cucumber varieties and the five key influencing factors; taste, texture, appearance, price and availability based on the Theory of Planned Behavior (TPB). A bivariate Pearson-Correlation was conducted to determine the strength and direction of the linear relationship between the variables (Table 2). The findings from the Pearson correlation give early support for the study’s objectives, showing clear connections between what was studied and what consumers prefer. Availability stood out the highest among the others ($r = 0.515$), followed by Price ($r = 0.478$); suggesting outside forces connected to the marketplace moderately influenced buying choices, especially in smaller regions such as Besut (Akoglu, 2018).

Table 2. Pearson correlation analysis

DV	Items	IV				
		Taste	Texture	Appearance	Price	Availability
Consumer Preferences	Pearson-correlation	0.458	0.437	0.409	0.478	0.515
	Significant Value	0.000	0.000	0.000	0.000	0.000
	n	140	140	140	140	140
	Strength of Relation	Moderate	Moderate	Moderate	Moderate	Moderate

These findings highlighted that consumer's preferences for cucumber varieties extend beyond sensory appeal and are more influenced by practical considerations related to access (market supply) and affordability (cost). If these varieties are not sold locally or cost too much, consumers tend not to buy them. That relates into the concept of perceived behavioural control; when a product is hard to find or too costly, individuals usually refuse to purchase it, even if they prefer it (Daniel, 2020; Bartkiene et al, 2019). The rationale behind this approach indicates that stronger perceptions increase both intended and actual decisions (Ajzen, 2020). Therefore, when someone sees a particular variety of cucumber as inexpensive and easy to get, they feel more in command and are likelier to go for it.

Moreover, the connection between taste, texture and appearance clarify how thinking impacts which products an individual prefers. Things like the refreshing taste of *Timun Ulam* or the crispness of *Timun Jepun*, contrasted to the soft texture of *Timun Hijau*, were considered important when consumers evaluate cucumbers, as reflected by the correlation for texture ($r = 0.437$). This demonstrates both senses and outside conditions shape the decisions on which cucumber variety wins favour (Baingana, 2024). Consumers tend to choose cucumbers they think taste good, looks fresher or has a pleasant texture. That idea corresponded with recent studies stated that the greater senses mean the more desire for fresh produce (Liu & Grunert (2020). What consumers think about flavour, how it feels and how it looks are very important, but so does cost and if it is easy to obtain. This really supports TPB's assumption. Choices are not just about enjoying something, but they are determined by whether buying it feels reasonable. Making cucumbers tastier does not seem sufficient on its own, yet low pricing and wide access allow individuals to actually go for them (Zhang et al., 2023).

Pearson product–moment correlation coefficients (r) and their corresponding significance levels (p) between Consumer Preferences (DV) and the five influencing variables, IVs (Taste, Texture, Appearance, Price and Availability) were reported in the correlation matrix shown in Table 3. Based on a sample size of 140 participants ($n=140$), the results showed that each variable used for prediction had moderate positive correlations with Consumer Preferences. Availability (IV5) exhibited the highest correlation with Consumer Preferences ($r = 0.515$, $p < 0.001$) compared to other IVs, highlighting that the availability to sources and getting access of different cucumber varieties is still a key determinant to consumer choice (Baingana, 2024).

Table 3. Pearson correlation matrix between Consumer Preferences (DV) and Independent Variables (IV1-IV5).

	DV Consumer Preferences	IV1 Taste	IV2 Texture	IV3 Appearance	IV4 Price	IV5 Availability
Pearson- Correlation	DV	1	0.458	0.437	0.409	0.478
	IV1	0.458	1	0.724	0.749	0.654
	IV2	0.437	0.724	1	0.747	0.775
	IV3	0.409	0.749	0.747	1	0.693
	IV4	0.478	0.654	0.775	0.693	1
	IV5	0.515	0.687	0.653	0.742	0.623
Significant (1-Tailed)	DV	-	0.000	0.000	0.000	0.000
	IV1	0.000	-	0.000	0.000	0.000
	IV2	0.000	0.000	-	0.000	0.000
	IV3	0.000	0.000	0.000	-	0.000
	IV4	0.000	0.000	0.000	0.000	-
	IV5	0.000	0.000	0.000	0.000	0.000

Sensory attributes also played a meaningful role, with Taste, IV1 ($r=0.458, p<0.001$) and Appearance, IV3 ($r=0.409, p<0.001$) showed moderate positive correlations, underscoring the importance of intrinsic product qualities within the Attitude component of the TPB. All correlations were moderately significant, evidenced by $p=0.000$ (indicating $p<0.001$) for all IV-DV pairs, justifying their inclusion in subsequent predictive modelling. The inter-correlation analysis further revealed several strong relationships among the IVs, particularly between the sensory attributes (IV1, IV2, IV3) and between Appearance (IV3) and Availability (IV5), exceed $r=0.70$. These high inter-correlations suggested potential overlap in how consumers evaluate sensory cues and product availability, indicating the need to assess multicollinearity before conducting multiple regression analysis.

The correlation findings offer initial proof that consumer preference for cucumber varieties in Besut were influenced by numerous interconnected elements, rather than one single dominant influence. The strongest correlation was observed for Availability ($r=0.515$), aligning with the PBC component of the TPB. This suggests that even though consumers might prefer certain varieties due to its flavour or looks, their decisions can still be limited by practical issues. These include issues like irregular availability of any cucumber variety in stores or restricted access to the items. Therefore, the market conditions seem to give a major impact on consumer purchasing decisions in the local region.

Additionally, the strong correlations among independent variables, especially those related to sensory traits, revealed a possible multicollinearity issue in the upcoming regression analysis. Taste (IV1) and Appearance (IV3) have correlations above $r>0.70$ (with $r=0.749$), suggest that these factors could not be completely isolated. Alternatively, they could represent a shared fundamental element connected to the overall product quality or the way consumers perceive the product (Rustagi, 2020). This overlap emphasises how important thorough statistical analysis is. This is essential to properly assess the distinct predictive contributions of every variable in the regression model.

Multiple Regression Analysis

The multiple regression model analysing the cumulative effect of the five independent variables, or IVs (Taste, Texture, Appearance, Price and Availability) on Consumer Preferences was summarized in Table 4. These five variables collectively contribute to 31.8% of the variance in Consumer Preferences for cucumber varieties in Besut. The model recorded a multiple correlation coefficient of $R=0.564$, with the coefficient of determination, R^2 value of 0.318. Given the number of variables evaluated, the Adjusted R^2 of 0.293 provides a considerably more reliable estimate. As is common for research incorporating consumer behaviour and social variables, the model's overall level of explanatory power was moderate.

Table 4. Model summary multiple regression analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.564 ^a	0.318	0.293	0.37217

a. Predictors: (Constant), IV1, IV2, IV3, IV4, IV5

Considerable understanding into the TPB's effectiveness in clarifying consumer preferences for cucumber varieties was obtained from the interpretation of the model fit. The implemented TPB constructs, Attitude (Taste, Texture, Appearance) and Perceived Behavioural Control (Price, Availability), collectively make up nearly a third of the variance in consumer preferences, according to the Adjusted R^2 value of 0.293. This demonstrated

that the selection of cucumber varieties like *Timun Hijau*, *Timun Ulam* and *Timun Jepun* is greatly influenced by both psychological evaluations and access-related constraints. However, the moderate explanatory power also suggests that few additional aspects are still important to be included. One obvious gap was the Subjective Norms construct, which represents social impact. This includes cultural eating habits of the consumers, friends' suggestions and family routines. The remaining 68.2% of the unexplained variance presumably could be obtained from this absence particular element (Elimelech et al., 2024; Hamilton et al., 2019).

In addition, the design of the model did not consider for contextual elements that could influence consumer decisions. These factors include the frequency of consumer buy things, their loyalty to brands or sellers, their health-related beliefs, and how they plan to consume or cook the products. These results showed that the regression model was effective in explaining the effects of certain variables. However, a better understanding of consumer behaviour will require further research that uses the entire TPB framework and considers other relevant contextual elements.

The Analysis of Variance (ANOVA) outcome clearly justified the overall significance of the multiple regression model. The model generated was highly significant, as illustrated in Table 5, with $F(5, 134) = 12.506, p < 0.001$, indicating that the combined influence of Taste, Texture, Appearance, Price and Availability had a great influence of predicting Consumer Preferences. This finding proved that it is less effective to rely only on the mean preference score rather than combining these five factors in a linear model to explain variance in preference. The ANOVA and coefficient analysis revealed those components that serve as the best components for the regression model.

Table 5. ANOVA of multiple regression analysis

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	8.661	5	1.732	12.506	0.000 ^b
1 Residual	18.560	134	0.139		
Total	27.221	139			

a. Dependent Variable: DV

b. Predictors: (Constant), IV5, IV4, IV1, IV3, IV2

The highly significant F -statistic confirmed the applicability of the predictors chosen under the TPB and offered substantial support for the overall validity of the multiple regression model. The ANOVA results confirmed that the combined influence of Attitude-related factors (Taste, Texture and Appearance) and PBC factors (Price and Availability) displayed a significant, non-random effect on consumer decisions regarding cucumber variety selection in Besut, considering the moderate explanatory power ($R^2 = 0.318$). This outcome verified that the chosen predictors are reasonable and statistically supported, thus directly fulfilling the study's objective of identifying important factors of preference. Furthermore, the study was able to be confidently proceed in identifying which factors function as the strongest unique predictors of consumer preference as the significance of the overall model provided the basis for interpreting the individual regression results. Thus, the outcomes of the ANOVA confirmed the model's robustness and prepared its structure for the coefficient analysis to examine the relative contributions of each specific factor.

The regression coefficient results presented in Table 6 revealed the unique contributions of each predictor to consumer preference when controlling for all other variables in the model. Among the five IVs, only Price (IV4) and Availability (IV5) emerged as statistically significant predictors ($p < 0.05$). Availability demonstrated the strongest influence, with a standardized coefficient of $\beta = 0.362$ ($p = 0.002$) and an unstandardized coefficient of

$B=0.279$, indicating that improved perceived availability leads to higher consumer preference scores. Price also showed a significant positive effect ($\beta=0.253$, $p=0.035$), suggesting that greater price acceptability or perceived value contributes meaningfully to preference, as supported by its unstandardized coefficient ($B=0.216$).

The findings clearly demonstrated that the PBC factor gave a major influence on Besut consumers' decision to purchase cucumber varieties, particularly when it comes to the TPB framework's greatest factors, which were price and availability. The most notable and most significant influence was found in Availability ($\beta = 0.362$), suggesting that consumers eventually give priority to the variety of cucumber that are consistently available in the Besut market.

Table 6. Coefficient of multiple regression analysis
Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
(Constant)	2.509	.320		7.849	.000	
1	IV1	.134	.102	.158	1.316	.190
	IV2	.009	.114	.011	.082	.935
	IV3	-.134	.110	-.162	-1.221	.224
	IV4	.216	.102	.253	2.130	.035
	IV5	.279	.087	.362	3.206	.002

a. Dependent Variable: DV

This means that limited distribution or insufficient supply served as the practical barrier, forcing consumers to choose whichever variety of cucumber they can consistently obtain, even though sensory characteristics like taste, texture or appearance were evaluated favourably. Price ($\beta = 0.253$) also had a strong positive influence, illustrating that consumers prioritise affordability when choosing alternatives of cucumbers that offer a fair balance between perceived quality and cost rather than just chosen the cheapest one. On the other hand, despite generally thought to be crucial to food choice behaviours, the three sensory factors (Taste, Texture and Appearance) that represented the Attitude component of the TPB, did not sufficiently predict consumer preference (Du et al., 2022).

There are two potential reasons could explain for this unexpected result. Firstly, multicollinearity was probably introduced into the regression model due to the high inter-correlations among sensory variables ($r > 0.70$), which suppressed their distinct contributions and produced non-significant effects (Azizam et al., 2020). Secondly, consumer perceptions on the three cucumber varieties under study (*Timun Hijau*, *Timun Ulam* and *Timun Jepun*) may be rather consistent, suggesting that sensory differences are either negligible or less significant than wider market accessibility concerns. As the result, assumptions regarding the effects of availability and price were confirmed, yet those regarding to sensory characteristics were not.

Overall, the findings showed that practical market factors, specifically consistent supply and perceived value, play a great decisive role on consumer preferences than minimal differences in sensory characteristics. These findings suggest that in order to successfully match consumer decision-making patterns in Besut, future breeding initiatives (Weng, 2021), marketing strategies and supply-chain intervention should prioritize on improving availability and preserving competitive pricing.

CONCLUSION

This study investigated consumer preferences for three commonly consumed cucumber varieties in Besut, Terengganu, and established the main factors influencing their choices. Using the Theory of Planned Behaviour

(TPB), the study's findings demonstrated that although consumers' perceptions were usually favourable towards cucumbers' sensory qualities, these attributes did not significantly affect their ultimate preference decisions in the regression model. Instead, the findings showed that the most important factors affecting consumer preference were price and availability, which together make up the Perceived Behavioural Control (PBC) component. This suggests that consumers are more influenced by price and what is available in the market than by taste, texture or appearance. Overall, the study concludes that practical market considerations are the main determinants of cucumber preference in Besut, rather than inherent product features.

In order to meet consumer demand, farmers should prioritise maintaining a consistent supply of cucumber varieties throughout the growing season. Product availability can be increased by developing connections with local markets, lengthening planting cycles and improving post-harvest management. Since affordability matters, adopting cost-efficient production practices can help farmers maintain competitive prices without sacrificing revenue.

Marketers and retailers must also prioritize price transparency and ensure consistent stock availability, since these elements greatly impact consumer decision. Consumers are typically motivated in their decisions, by discounts and promotions, package pricing and clear labelling of cucumber varieties. Highlighting freshness, visual appearance and crisp texture may nevertheless increase favourable evaluations of the product even though sensory characteristics were not greatly important predictors in this obtained finding. Perceived accessibility can be further strengthened by expanding distribution channels within local markets in Besut.

Upcoming studies ought to integrate Subjective Norms within the TPB framework as cultural consumption behaviours, domestic dining routines, home eating habits and social influence could also have an impact on variety selections. To boost explanatory power, supplementary variables such as frequency of purchases, culinary usage, health beliefs, seasonal price fluctuations and brand or vendor loyalty should be considered. In addition to enabling a larger generality of the findings, expanding the study to other Malaysian states or districts might aid in the formulation of region-specific cucumber production and marketing plans.

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