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**A PLS-SEM APPROACH TO ANALYZING THE MARKETING MIX AND ITS  
IMPACT ON REPURCHASE INTENTIONS IN THE PARBOILED RICE MARKET**

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**ABSTRACT**

The market landscape is marked by intense competition, necessitating continuous product enhancements, particularly within the food sector. To meet evolving consumer demands and adapt to changing consumption patterns, the marketing mix serves as a strategic tool to foster profitable relationships rooted in consumer satisfaction and loyalty. This study aims to investigate the impact of the marketing mix on consumer satisfaction with parboiled rice and to examine its influence on repurchase intentions. Data were collected from 300 respondents and analyzed using PLS-SEM. Findings indicate that marketing mix elements; product, price, place, and promotion, positively and significantly influence consumer satisfaction. However, the relationship between these variables and repurchase intentions varied. The final model supports the connection between satisfaction and the intention to repurchase. Product attributes, such as the health benefits of parboiled rice, play a crucial role, alongside the significance of the sales location. Remarkably, there was no evidence to support the notion that price and repurchase intention were related, and promotion had a negative correlation with repurchase intention, which calls for more research. These insights are invaluable for parboiled rice producers and marketing managers, highlighting the need to enhance these product aspects to boost consumer engagement and loyalty.

**Keywords:** consumer loyalty, food marketing, health-oriented purchasing, PLS-SEM in marketing, purchasing behaviour

## INTRODUCTION

The global rice industry has long acknowledged the advantages of parboiled rice, which is distinguished by its unique processing methods and enhanced nutritional profile. Unlike standard white rice, parboiled rice undergoes a series of processes: soaking, steaming, and drying the paddy before husking. This technique not only improves the texture and durability of the rice grains but also retains a higher concentration of nutrients, including fibre, vitamins, and minerals, typically lost during the milling of white rice (Mudgal & Singh, 2024). Additionally, the alteration in starch structure makes parboiled rice less likely to break during cooking, increasing its appeal to consumers and producers. Due to these benefits, parboiled rice is highly esteemed in health-conscious markets globally, as well as in regions where traditional diets emphasize nutrient-rich staples. Parboiled rice's health benefits, such as a lower glycaemic index than white rice, make it a preferred choice for individuals managing conditions like diabetes or seeking a balanced, nutrient-dense diet. Its capacity to slow glucose absorption has cemented its reputation as a functional food promoting healthier eating habits.

In Malaysia, there has been a significant increase in the consumption of parboiled rice in recent years, driven by growing awareness of its health benefits. This upward trend is evident in urban areas and among communities historically dependent on rice as a dietary staple. Among these, the Indian ethnic group has long incorporated parboiled rice into their culinary traditions (Ankita & Seth, 2025), making it both a culturally significant and nutritionally beneficial food. As consumers increasingly seek healthier alternatives to traditional white rice, the demand for parboiled rice has surged. This growing demand has intensified competition among rice producers and marketers, each striving to position their products as the preferred choice. In this competitive market, achieving a competitive edge allows a business to differentiate its products and services from those of its competitors, delivering greater value and superior customer service. This requires a strategic focus. The marketing mix, often referred to as the 4Ps, plays an essential role in this process (Al Badi, 2018), as it is instrumental in providing customer value and satisfaction. It is an effective tool for meeting customer needs and fostering sustainable relationships over the long term.

The research problem addressed in this study is the limited understanding of how the marketing mix influences customer satisfaction and repurchase intention in the parboiled rice market in Malaysia. While various studies have examined the marketing mix's impact in other industries, research on its role in the parboiled rice market remains scarce. This gap highlights the need for further investigation. Using parboiled rice as a case study, this research underscores the importance of the marketing mix in securing a competitive advantage for food producers and marketers. Agricultural products typically operate in highly competitive and rapidly changing markets. Entrepreneurs must secure a competitive edge to survive, attract new clients, and expand into new markets. Despite its significance, limited research has been conducted on the food industry's marketing mix and competitive advantage. By examining how marketing mix elements support a competitive edge in customer satisfaction and loyalty within the food industry, this study seeks to close that gap.

Consumer satisfaction often leads to repeat purchases, while loyal customers tend to stick with a brand over time, making regular purchases rather than succumbing to impulse buys. The marketing mix significantly influences customer satisfaction and repurchase intention across various product categories. Studies on bottled water (Kusuma & Suryani, 2017), SME products (Jasin & Firmansyah, 2023), organic food (Farida, 2019), and banana bread (Hidayat & Trifiyanto, 2020) consistently demonstrate positive relationships between marketing mix elements and these outcomes. Customer satisfaction was found to mediate the effect of marketing mix on repurchase intention (Kusuma & Suryani, 2017). Product quality is particularly crucial in shaping customer satisfaction and repurchase

intention for organic food (Farida, 2019). Service quality also significantly influences customer satisfaction and repurchase intention (Jasin & Firmansyah, 2023; Hidayat & Trifiyanto, 2020). While most marketing mix elements (product, price, place, promotion, and service) significantly affect customer satisfaction, only product, price, and service significantly impact repurchase intention for organic food (Farida, 2019). These findings underscore the importance of effective marketing mix management in enhancing customer satisfaction and encouraging repeat purchases.

Given that acquiring new customers can cost up to five times more than retaining existing ones (McDonalds et al., 2003), the parboiled rice industry gains significantly from fostering customer loyalty. This is particularly critical in a market where rising health consciousness has fuelled demand and intensified brand competition. Factors such as price sensitivity, product differentiation, and consumer-switching behaviour pose challenges to long-term retention. While it has been established that the marketing mix plays a fundamental role in shaping customer satisfaction and repurchase intention, its specific impact within the parboiled rice remains underexplored. Further research is necessary to assess how strategic adjustments can be made to drive sustainable business growth in the parboiled rice market. Thus, this study examines the influence of product, price, place, and promotion on customer satisfaction and repurchase intention in the parboiled rice market.

## **LITERATURE REVIEW**

Parboiled rice has gained global recognition for its unique processing advantages and improved nutritional profile compared to regular white rice. The process of parboiling involves three main steps: soaking, steaming, drying, and husking. This process helps to retain nutrients such as fibre, vitamins, and minerals that are usually lost during the processing of white rice (Bhattacharya, 2011). Additionally, the structural changes in the starch in parboiled rice make it more resistant to breakage during cooking, increasing its appeal to producers and consumers. Studies by Larsen et al. (2000) and Wordu and Banigo (2013) showed that parboiled rice has a lower glycaemic index than white rice. This feature makes it suitable for individuals with diabetes or those looking for healthier food options. Furthermore, its properties that help slow down glucose absorption have strengthened its reputation as a functional food for a healthier diet. In Malaysia, the consumption of parboiled rice is increasing, especially among the public who are becoming aware of its health benefits. This development is also driven by the traditional practices of ethnic Indians in Malaysia, who have long prioritized parboiled rice in their diet.

Building upon the growing consumer acceptance of parboiled rice due to its health benefits, it becomes imperative for companies within the food industry to leverage this trend to gain a competitive advantage. Competitive advantage is an important element for maintaining business continuity. Competitive advantage allows companies to differentiate their products from competitors and provide added value to customers (Porter, 1985). In this regard, the elements of the marketing mix, or 4P (Product, Price, Promotion, Place), play an important role in creating customer satisfaction and lasting relationships. A study by Al Badi (2018) asserted that the marketing mix is a strategic tool to meet customer needs, enhance product value, and foster long-term relationships. In the food industry, applying a strategic marketing mix can help manufacturers achieve market targets through customer satisfaction and increase the competitiveness of their products.

Customer satisfaction is often associated with repeat purchases, while customer loyalty ensures the stability of business relationships in the long term. Customer satisfaction is a multifaceted concept that is crucial in business marketing and strategy. It is generally defined as the degree to which a company's

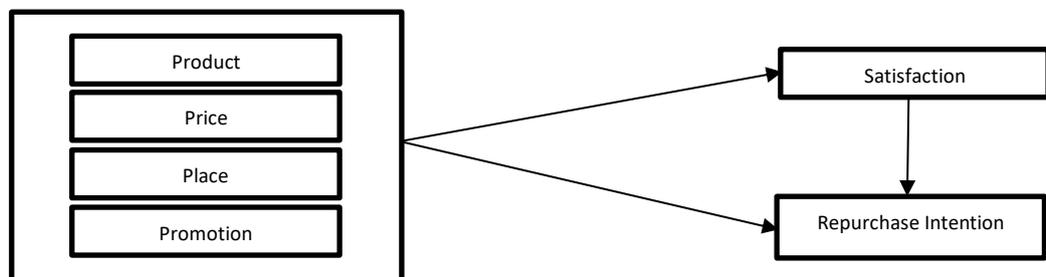
products or services meet or exceed customer expectations, leading to positive customer experiences and behaviors. Studies show that satisfied customers are more likely to make repeat purchases and indirectly become brand advocates (Kotler & Keller, 2016). The importance of food quality is underscored by its role in shaping repurchase intentions. A study by Ellitan and Edgar (2024) revealed that food quality significantly influences customer satisfaction, which in turn drives repurchase intentions. This emphasizes the need for food industry players to maintain high-quality standards to ensure customer retention and loyalty. In the food industry, like parboiled rice, the cost of acquiring new customers is usually higher than retaining existing customers. Therefore, an effective marketing strategy is critical to maintaining customer loyalty, primarily through the marketing mix. For example, a study by Muhamad Radzi et al. (2023) found that price and product quality influence customer satisfaction in the food industry in Malaysia.

Recent studies have explored the impact of marketing mix elements on customer satisfaction and loyalty in the food sector. Research consistently shows that product and price significantly positively affect customer satisfaction (Ratnawati et al., 2024; Nuseir & Madanat, 2015). While some studies found place and promotion to be less influential (Ratnawati et al., 2024; Danapriatna et al., 2024), others reported positive effects for all 4Ps (Nuseir & Madanat, 2015; Mustaqimah et al., 2019). The literature review suggests a positive link between customer satisfaction, loyalty, and repurchase intention across multiple studies (Ratnawati et al., 2024; Curtis et al., 2011; Tsai et al., 2006). The marketing mix elements were also shown to affect loyalty through customer satisfaction indirectly (Danapriatna et al., 2024). These findings highlight the importance of focusing on product quality and pricing strategies to enhance customer satisfaction.

Although many studies have been conducted on the role of marketing mix in various industries, specific studies on its impact in the food sector, especially about products such as parboiled rice, are still lacking. A study by Fachriyani et al. (2022) suggests that understanding the relationship between marketing mix and consumer behaviour is important to improve competitiveness in the food marketplace. However, there is a gap in research on how the marketing mix can influence repurchase intention and customer satisfaction in the context of parboiled rice in Malaysia. The research model that guides this study is shown in Figure 1.

**Figure 1**

*Research Model*



The research model in Figure 1 configures the relationships among the key variables - Product, Price, Place, Promotion, Satisfaction, and Repurchase Intention—all of which assume a direct effect. In this framework, the 4Ps of the marketing mix (Product, Price, Place, and Promotion) are conceptualized as independent constructs that directly influence Satisfaction as well as Repurchase Intention. Additionally, Satisfaction is then posited as also having a direct influence on Repurchase Intention. This structure emphasizes how the marketing mix components not only contribute to customer satisfaction but also directly affect the likelihood of repeat purchases. The satisfaction and repurchase intention

pathway is also included for testing. This approach offers actionable insights for optimizing marketing strategies to enhance consumer loyalty in the context of parboiled rice consumption. Subsequently, nine hypotheses were proposed based on previous literature:

- H1a. The higher the quality of parboiled rice, the higher the consumer's satisfaction.
- H1b. The higher the quality of parboiled rice, the higher the consumer's intention to repurchase.
- H2a. The higher the price of parboiled rice, the higher the consumer's satisfaction.
- H2b. The higher the price of parboiled rice, the higher the consumer's intention to repurchase.
- H3a. The higher the promotional activities of parboiled rice, the higher the consumer's satisfaction.
- H3b. The higher the promotional activities of parboiled rice, the higher the consumer's intention to repurchase.
- H4a. The sales location of parboiled rice is positively related to the consumer's satisfaction.
- H4b. The sales location of parboiled rice is positively related to the consumer's intention to repurchase.
- H5. The higher the consumer's satisfaction with parboiled rice, the higher the consumer's intention to repurchase.

## **METHODOLOGY**

A questionnaire was created to test the study model empirically. Sections in the questionnaire include marketing mix components, namely product, price, place, and promotion, as well as sections on consumer satisfaction and repurchase intention. The structured questionnaire was also supplemented by demographic profiling to provide comprehensive respondent information. Most of the measurement items in the questionnaire were adapted from the literature. The operational definition for Product is the parboiled rice offered to consumers. Price is operationally defined as everything related to the cost of purchasing the parboiled rice, while Place is the sales location and its environment, and Promotion are the elements to communicate the parboiled rice to the public. These questionnaire items were adapted from Chou et al. (2020), Maulana et al. (2021), and Moriuchi and Takahashi (2021). Specifically for measuring Satisfaction, the items were adapted from Seo et al. (2020) and Maulana et al. (2021) and operationally defined as the feelings of pleasure or disappointment resulting from comparing the product's perceived performance against expectations. For measuring Repurchase Intention, items were adapted from Seo et al. (2020) and Maulana et al. (2021) and operationally defined as the interest in buying parboiled rice based on the buying experience that has been done in the past. A five-point Likert scale was adopted with anchors ranging from strongly disagree (1) to strongly agree (5) for all measures.

The study employed a non-probability sampling method to collect data from 300 respondents across three major regions of Peninsular Malaysia: the north, central, and south zones. The target population consisted of regular consumers of parboiled rice, selected to ensure representation across diverse racial and gender demographics. A purposive sampling approach was utilized to focus on households with high parboiled rice consumption, ensuring the relevance of responses to the study objectives. Participants were asked to evaluate statements about marketing mix components influencing their parboiled rice purchasing decisions. Prior to that, a pilot test was conducted with respondents who share

characteristics similar to those of the target population. Feedback from the pilot test improved the questionnaire by refining ambiguous questions and ensuring all items effectively capture the intended constructs. The final questionnaire has a cover letter on the first page to ensure that respondents were informed about the study objectives, that their participation was voluntary, and that their responses would be kept confidential.

Data analysis consists of a two-step analysis of the measurement and structural models. The two-step technique establishes the reliability and validity of the measures before examining the model structure. Two methods of structural equation modelling (SEM) were taken into consideration in order to examine the hypotheses proposed in this study, namely the covariance-based approach and the variance-based approach (Hair et al., 2011). Hair et al. (2011) suggested that covariance-based SEM should be used if the research objective is theory testing and confirmation. On the other hand, variance-based SEM is appropriate if the research objective is for prediction and theory development. Each endogenous variable undergoes an independent multiple regression analysis using a bootstrapping estimation procedure in the variance-based approach (Hair et al., 2012).

Since this study aims to predict the influence of the marketing mix components on customer satisfaction and repurchase intention, the study chose to use a variance-based approach (PLS-SEM) for further analysis. PLS-SEM has gained popularity in business and marketing research due to its ability to handle complex models, small sample sizes, and non-normal data (Hair et al., 2014). It is also useful for theory development and allows researchers to explain better relationships among variables (Soujata Rughoobur-Seetah et al., 2021). In consumer food research, it has been applied to study organic food consumers' behaviour (Sultan et al., 2020). Using PLS-SEM is considered appropriate to meet the study's research objectives by following guidelines for proper validation and communication of results (Margalina Vasilica-Maria et al., 2023). Multicollinearity was evaluated using the Variance Inflation Factor (VIF) values, all of which were within acceptable thresholds. Normality was assessed through skewness and kurtosis values, which confirmed that PLS-SEM's flexible distribution requirements would appropriately handle non-normal data characteristics. Reliability was verified through composite reliability (CR) values, while validity was verified through HTMT values, as explained further in the results and discussion section.

## **RESULT AND DISCUSSION**

### **Demographic Profile**

Based on the analysis of respondents' socio-economic profile, a significant portion of respondents are aged between 31 and 40 (29.7%). The dominance of the 31-40 age group suggests targeting an active, potentially upwardly mobile segment that values quality and efficiency in food products. Females constituted 64.3% of the sample, while males accounted for the remainder. The higher percentage of female respondents may indicate that women are key decision-makers in household grocery purchases. The majority of the ethnicity represented was Malay (56.7%). The significant proportion of Malays may imply cultural or geographic specificity in the study's findings, warranting careful consideration in broader applications. With Malays forming the majority, cultural preferences and dietary habits must be considered. Income data indicated that the predominant range is RM4,851 to RM5,880. The prevalent income range indicates a market segment that may seek value for money but is willing to pay for quality. Most respondents possess educational qualifications at the level of certificates, diplomas, or university degrees (68.3%), with 28.3% holding secondary school qualifications. Highly educated

respondents are likely to be informed consumers who prioritize health and nutrition. Table 1 further elucidates that 32.3% of participants are employed in the private sector, and 29.0% are civil servants. With a significant portion of respondents working in the private sector and civil service, marketing efforts could focus on convenience and work-life balance. Additionally, a substantial majority (64.0%) belong to households with more than four members. Larger households may prioritize bulk purchases and family-friendly products.

**Table 1**

*Socioeconomic background of respondents (N = 300)*

<b>Item</b>	<b>Category</b>	<b>Percent (%)</b>
<b>Age</b>	< 20 years	2.0
	21 - 30 years	10.0
	31 - 40 years	29.7
	41 - 50 years	27.7
	51 - 60 years	17.3
	> 61 years	13.3
<b>Gender</b>	Male	35.7
	Female	64.3
<b>Race</b>	Malay	56.7
	Chinese	18.7
	Indian	24.3
	Others	0.3
<b>Religion</b>	Islam	57.7
	Christian	3.3
	Hindu	22.0
	Buddha	15.7
	Others	1.3
<b>Education</b>	Informal	0.7
	Primary	2.7
	Secondary	28.3
	University	68.3
<b>Occupation</b>	Government sector	29.0
	Private sector	32.2
	Self-employed	11.7
	Student	4.0
	Retiree/Pensioner	8.0
	Not working	14.7
	Others	0.3
<b>Household income</b>	< RM2,500	13.0
	RM2,501 - RM3,170	13.3
	RM3,171 - RM3,970	4.7
	RM3,971 - RM4,850	9.7
	RM4,851 - RM5,880	16.7
	RM5,881 - RM7,100	8.7
	RM7,101 - RM8,700	5.3
	RM8,701 - RM10,970	15.7
	RM10,971 - RM15,040	8.3
	>RM15,041	4.7
<b>Household Size</b>	1 person	4.3
	2 people	14.7
	3 people	17.0

4 people and more

64.0

Source: Research Data, 2023

### Measurement Model for Validity and Reliability Testing

To explore the relationships between the key variables in this research, Table 2 outlines the details of the measured items. The focus encompasses four primary dimensions of the marketing mix: Product, Price, Place, and Promotion (4Ps). Each variable is represented by a specific set of items (E1 to E15), capturing various aspects of the respective constructs. The loadings, ranging from 0.6 to 0.9, were evaluated to determine the strength of association between items and their respective variables. For example, item E1 under the Product dimension has a loading value of 0.874, indicating its strong contribution to assessing product-related perceptions. Factor loadings for E5 and E13 are slightly lower but still within an acceptable range (Chin, 1998). Items E10 and E12 were removed due to low loadings, ensuring that only items with strong indicator reliability were retained.

**Table 2**

*The Measurement Model*

Variable	Item	Loadings	CR	AVE
<b>Product</b>	E1	0.874	0.920	0.743
	E2	0.903		
	E3	0.808		
	E4	0.860		
<b>Price</b>	E5	0.656	0.851	0.589
	E6	0.794		
	E7	0.797		
	E8	0.812		
<b>Place</b>	E9	0.834	0.757	0.611
	E11	0.725		
<b>Promotion</b>	E13	0.682	0.787	0.553
	E14	0.828		
	E15	0.714		
<b>Satisfaction</b>	E16	0.843	0.885	0.720
	E17	0.876		
	E18	0.825		
<b>Repurchase Intention</b>	E19	0.868	0.904	0.703
	E20	0.794		
	E21	0.906		
	E22	0.781		

Note: E10 and E12 were deleted due to low loadings.

The reliability and validity of the measurement model were established through two essential metrics. First, the composite reliability (CR) values, ranging from 0.757 to 0.920, confirmed the internal consistency of the items for each variable, with higher CR values indicating greater reliability (Fornell & Larcker, 1981). Second, the average variance extracted (AVE) assesses convergent validity by measuring the variance captured by a construct relative to the variance due to measurement error, with an AVE value above 0.50 indicating adequate convergent validity. All the study constructs met this

criterion, with values ranging from 0.553 to 0.743, demonstrating satisfactory validity, representing the proportion of variance captured by the items. Beyond the 4Ps, additional variables such as satisfaction and repurchase intention were evaluated. Items E16 to E22 exhibited high loadings (0.7 to 0.9), alongside consistent CR and AVE values, further validating their reliability and robustness.

In the subsequent step, discriminant validity was analyzed using the HTMT criterion outlined by Henseler et al. (2015). This ensures that distinct constructs are conceptually separate. The measurement model confirmed discriminant validity, with loadings showing clear differentiation across constructs. As shown in Table 3, HTMT values remained below the threshold of 0.85. The highest HTMT is 0.82 (Satisfaction-Repurchase Intention). This suggests these two constructs are closely related but still empirically distinct. No values exceed 0.90, even under a more lenient threshold, further confirming construct distinctiveness.

**Table 3**

*Discriminant validity (HTMT)*

		1	2	3	4	5	6
1	Product						
2	Price	0.818					
3	Place	0.776	0.663				
4	Promotion	0.628	0.480	0.447			
5	Satisfaction	0.720	0.579	0.662	0.271		
6	Repurchase Intention	0.770	0.787	0.698	0.499	0.82	

The results provide strong evidence of discriminant validity in the model, confirming that each construct measures a unique concept. It enhances the robustness of the research findings, ensuring that observed relationships are not due to measurement overlap. The results further affirm that the measurement items are reliable and valid for the examined variables.

**Structural Model for Hypothesis Testing**

Following the validation of the measurement model, the structural model was assessed to test the hypothesized relationships among the key constructs. The current study looked at the R2 value, also referred to as the coefficient of determination. The R2 for satisfaction is 0.504, indicating that the exogenous variables account for approximately 50.4% of the variation in satisfaction. This value reflects a moderate to substantial explanatory power within the context of social science research, particularly in marketing and consumer behaviour studies, where R2 values above 0.50 are considered meaningful. The result demonstrates that half of the variability in consumer satisfaction with parboiled rice can be attributed to the identified marketing mix elements, underscoring the relevance of these variables in shaping customer perceptions.

All four hypotheses of the marketing mix indicators were supported since there was a positive correlation between satisfaction and place ( $\beta=0.158, p<0.01$ ), price ( $\beta=0.348, p<0.01$ ), product ( $\beta=0.280, p<0.01$ ), and promotion ( $\beta=0.114, p<0.01$ ). While all marketing mix elements contribute to satisfaction, product and price provide the most potent effects. Notably, product quality and price exert stronger influences on satisfaction than place and promotion, suggesting that consumers are susceptible to intrinsic product attributes and perceived value. The remaining 49.6% of unexplained variance may be due to other factors not captured in this model.

The following finding that lends credence to H1b is that the product positively correlated with intention to repurchase ( $\beta=0.239, p<0.01$ ). However, H2b did not show any significance, because the p-value of 0.40 does not meet the 0.05 criterion. This implies that pricing strategies may be more relevant for initial customer satisfaction rather than repeat purchases. Furthermore, it is important to note that the relationship between intention to repurchase and place ( $\beta=0.166, p<0.01$ ) is positive. On the other hand, promotion ( $\beta=-0.108, p<0.01$ ) is adversely associated with intention to repurchase. This suggests that certain promotional tactics may fail to foster long-term commitment. Both hypotheses 3b and 4b were supported. Lastly, in H5, satisfaction positively affects intention to repurchase ( $\beta = 0.510$ ). A p-value of 0.000 is more than the significance level of 0.05, lending credence to the hypothesis. The exogenous variables account for 54.2% of the variation in repurchase intention, as shown by the substantial R2 value of 0.542 for the endogenous construct of intention to repurchase.

Table 4 displays the results of applying a bootstrapping technique with 5000 subsamples to the structural model, including the path coefficients, standard deviations, t-values, p-values, bias-corrected confidence intervals, and effect sizes. The effect size, denoted by the symbol  $f^2$ , was determined by analysing the changes in R2 values (Hair et al., 2017). As a rule of thumb, values above 0.02, 0.15, and 0.35 indicate small, medium, and large  $f^2$  effect sizes (Cohen, 1988). The effect sizes of  $f^2 = 0.095$  for satisfaction and 0.069 for repurchase intention confirm that product quality contributes meaningfully to the model. Price has a moderate effect size of  $f^2 = 0.152$ , similarly with place, whereby its effect sizes for satisfaction are  $f^2 = 0.035$  and repurchase intention is  $f^2 = 0.040$ . Customer satisfaction demonstrated a substantial effect size of  $f^2 = 0.282$ . According to the recommendations, the supported hypotheses' effect size is satisfactory.

**Table 4**

*Hypothesis Testing Results*

H <sub>A</sub>	Relationship	$\beta$	SD	t-value	p-value	BCI LL	BCI UL	$f^2$
H <sub>3b</sub>	Place -> Repurchase Intention	0.166	0.061	2.709	0.003	0.070	0.270	0.040
H <sub>3a</sub>	Place -> Satisfaction	0.158	0.056	2.843	0.002	0.063	0.244	0.035
H <sub>2b</sub>	Price -> Repurchase Intention	-0.014	0.056	0.241	0.405	-0.110	0.075	0.000
H <sub>2a</sub>	Price -> Satisfaction	0.348	0.069	5.038	0.000	0.236	0.464	0.152
H <sub>1b</sub>	Product -> Repurchase Intention	0.239	0.058	4.114	0.000	0.147	0.337	0.069
H <sub>1a</sub>	Product -> Satisfaction	0.280	0.058	4.838	0.000	0.188	0.379	0.095
H <sub>4b</sub>	Promotion -> Repurchase Intention	-0.108	0.043	2.535	0.006	-0.182	-0.042	0.021
H <sub>4a</sub>	Promotion -> Satisfaction	0.114	0.056	2.052	0.020	0.022	0.204	0.022
H <sub>5</sub>	Satisfaction -> Repurchase Intention	0.510	0.062	8.236	0.000	0.400	0.606	0.282

The marketing mix variables were used as the determinants to understand Malaysian customers' satisfaction and intention to repurchase parboiled rice. Hypothesis testing is a foundation that allows practitioners and researchers to make informed decisions based on reliable and valid assessments. It has been observed that when purchasing parboiled rice, customers consider its distribution methods and retail locations. This shows that better distribution channels and easily accessible marketing locations positively affect customer satisfaction and their decisions to repeat their purchases.

A positive relationship between product and satisfaction shows that greater product features result in higher satisfaction levels. This is consistent with research by Malekpour et al. (2022), who discovered that customer satisfaction was positively and significantly impacted by the product attributes,

moderated by competitive intensity. Furthermore, the most crucial link is the one that exists between customer's satisfaction and their intention to continue making purchases. Consistent with what Sultan et al. (2020) found, satisfaction significantly enhances their buying behaviour. Customers are more inclined to return for more purchases when satisfied. The health benefits that parboiled rice users obtain are also factors that influence their decision-making process. It is necessary to pay particular attention to the processed ingredients and packaging, in addition to maintaining strict product control. This should also be done to establish more consistent pricing policies.

Higher customer satisfaction is correlated with higher pricing for parboiled rice. This may indicate that buyers find the product valuable even when expensive. Price by itself, however, might not be the deciding factor for repeat purchases, as seen by the absence of evidence supporting price's influence on the intention to repurchase. This makes sense in the case of consumers of parboiled rice who place a higher value on the product's health advantages than on its relatively higher selling price about the market price of white rice. For example, the high cost of organic rice puts buyers in a selected group of people who are prepared to pay more for it because they recognise its excellence. In the study of Aschemann-Witzel & Zielke (2017), consumers are willing to pay a premium of around 30% for organic products, corroborating the parboiled rice situation.

Remarkably, the non-significant finding between price and repurchase intention may reflect the unique purchasing behaviour of parboiled rice consumers. Potential confounding variables include perceived value and brand loyalty. Since parboiled rice is often perceived as a health-conscious choice, consumers may prioritize quality, nutritional value, and product trustworthiness over price (Hati et al., 2020). As a result, consumers might be less sensitive to price variations when making repeat purchases, especially if they view the product as essential for their dietary preferences or well-being. Additionally, the presence of various brands offering similar price ranges may reduce price differentiation, further weakening its impact on repurchase decisions.

The unexpected negative impact of promotion may be attributed to ineffective or excessive promotional strategies. Overusing discounts or aggressive marketing tactics could inadvertently create a perception of reduced product quality or temporary price manipulation. For parboiled rice consumers, who may prioritize quality and health benefits, excessive promotions could signal lower product value or raise concerns about authenticity (Verhaal & Dobrev, 2020). Therefore, promotion type, consumer perception, and purchase frequency are the potential confounding variables.

Finally, it was found that the effectiveness of promotional activities influences customer satisfaction. Effective marketing initiatives improve the whole experience. Surprisingly, promotion has an adverse effect on repurchase intention in this study. The outcome demonstrates a negative association between consumers' intentions to repurchase and their impression of promotions. This could suggest that loyalty may not always result from excessive promotions or discounts. In other words, specific promotional tactics may fail to foster long-term commitment and could instead lead to price-sensitive behaviour rather than sustained loyalty. In fact, Hecht et al. (2020) found that retailer marketing strategies were less effective at driving sales of healthy products than unhealthy ones.

## **PRACTICAL IMPLICATIONS**

This study offers significant novelty by developing and empirically testing a framework that examines the relationship between the marketing mix, consumer satisfaction, and repurchase intention, specifically in the context of parboiled rice. This is a niche and under-researched segment in the

Malaysian food market. Unlike previous studies that broadly examine repurchase intentions for general food products, this research focuses on parboiled rice, which holds unique consumption patterns and marketing challenges. Furthermore, the study advances the marketing literature by revealing the contrasting roles of the marketing mix elements, where product quality and place or distribution channels are strong drivers of satisfaction and repurchase intention, whereas price and promotion exhibit weaker or even adverse effects on repurchase behaviour. Integrating PLS-SEM to analyze the relationships between multiple latent variables in this context also enhances methodological contributions.

From a practical perspective, the findings of this study provide valuable insights for marketers, producers, and policymakers in the food and agricultural sectors. The strong influence of product quality on both satisfaction and repurchase intention highlights the need for manufacturers to focus on maintaining and communicating superior quality, including the health benefits and nutritional value of parboiled rice, to attract and retain customers. Meanwhile, the significant role of place or distribution channels underscores the importance of ensuring wide and convenient availability of parboiled rice in both urban and rural markets, leveraging efficient supply chains and partnerships with retailers.

Another implication is that the insignificant impact of price on repurchase intention suggests that consumers prioritize value and health benefits over cost, meaning that price-based competition may be less effective than value-based differentiation strategies. Furthermore, the adverse effect of promotion on repurchase intention serves as a cautionary insight that over-promotion, excessive discounts, or poorly targeted campaigns may harm long-term consumer trust and loyalty. Therefore, marketers should adopt balanced and targeted promotional strategies that enhance product image without eroding perceived value. Finally, by identifying satisfaction as an important factor, this study emphasizes the need to invest in customer satisfaction programs, including feedback mechanisms and after-sales engagement, to build strong consumer relationships.

## **CONCLUSION**

This study developed a robust framework that examines the relationship between the marketing mix (4Ps), consumer satisfaction, and repurchase intention for parboiled rice in Malaysia. Findings indicate that product quality and distribution channels (place) significantly enhance customer satisfaction and positively influence repurchase intention. In contrast, the impact of price on repurchase intention is less significant, suggesting that consumers prioritize perceived value and health benefits over cost. Interestingly, promotional strategies negatively influenced repurchase intention, highlighting potential pitfalls of excessive discounts or poorly executed campaigns. These results underscore the importance of a balanced marketing approach that prioritizes product attributes, effective distribution strategies, and moderate promotional efforts to sustain consumer loyalty.

Using the Partial Least Squares Structural Equation Modelling (PLS-SEM) approach offered distinct advantages. This method allowed for comprehensive analysis, including evaluating complex relationships among latent variables and testing multiple hypotheses simultaneously. The robust  $R^2$  values for consumer satisfaction and repurchase intention emphasize the model's predictive strength. Additionally, the bootstrapping technique provided reliable path coefficients, supporting the validity and reliability of the constructs. Researchers and practitioners in the food industry can utilize the insights derived from PLS-SEM to design evidence-based marketing strategies that enhance consumer satisfaction and loyalty.

Nevertheless, this study is not without limitations. First, the research was confined to the Malaysian parboiled rice market, which may limit the generalizability of the findings to other regions or rice types. Consumer preferences, cultural factors, and economic conditions in other countries may produce different outcomes. Second, using a cross-sectional design restricts the ability to capture changes in consumer behaviour over time. Longitudinal studies could provide deeper insights into how marketing strategies influence repurchase intentions in the long term. Third, although PLS-SEM is a powerful tool for analyzing complex relationships, the model may overlook unobserved variables or contextual factors that shape consumer satisfaction and loyalty.

Future research can explore the nuanced dynamics between pricing strategies and consumer perceptions to refine marketing practices. This study also paves the way for cross-regional analysis to understand how consumer behaviour towards parboiled rice differs across cultural and economic contexts. Future studies could also address the limitations by incorporating moderating or mediating variables. Integrating holistic marketing strategies grounded in empirical evidence can drive sustained business growth and customer retention in the competitive agricultural product market.

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### **CONFLICT OF INTEREST**

The authors declare no conflict of interest.

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