



Purchase Intention for Packaged and Unpackaged Products: Contamination and High Price Effects

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Abstract: *This study examines the effect of packaging type (packaged vs. unpackaged) on purchase intentions for fresh fruits and vegetables, within the context of the mediating role of perceived contamination and the moderating effect of perceived high price. While previous studies have addressed these factors separately, studies integrating all of them within a single framework are limited. Considering hygiene concerns and economic considerations, this study aims to understand consumer decision mechanisms in food retailing better. The study was conducted with 435 adult participants in Türkiye using convenience sampling. Although the sample is not nationally representative, it is sufficient for hypothesis testing and multivariate analyses. Exploratory and confirmatory factor analyses were performed, followed by regression-based mediation and moderation analyses. The results indicate a higher purchase intention for packaged products. Perceived contamination mediates the effect of packaging, particularly for unpackaged products, and limits the negative effect of high price perception. This study provides an integrated framework linking packaging, perceived contamination, and price evaluation to purchase intention.*

Keywords: Consumer Behavior, Purchase Intention, Packaging, Perceived Hygiene, Price Sensitivity

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1. Introduction

Consumer purchase intention is a core concept in marketing research, as understanding the factors shaping consumer choices allows firms to adjust strategies in response to market changes. Among these, price perception, product presentation, and perceived contamination risk are crucial in influencing purchasing decisions. In food retailing, packaging's influence on consumer attitudes and behaviors remains highly debated (Yeo et al., 2020). According to Fishbein and Ajzen's theory of reasoned action, the strongest determinant of a behavior is the intention to perform that behavior (Fishbein & Ajzen, 1977). Ajzen's (1991) theory of planned behavior also supports this approach; as an individual's purchase intention increases, the likelihood of actually purchasing the product in question increases (Ajzen, 1991). Therefore, purchase intention is considered a critical cognitive indicator that reflects consumers' propensity to purchase a particular product. In marketing research, it is difficult to measure actual purchase behavior directly; therefore, intention measurements provide a reliable alternative for predicting behavior (Dodds et al., 1991; Schiffman et al., 2000). For example, studies such as those by Dodds et al. (1991) and Schiffman et al. (2000) have indicated that purchase intention directly reflects the consumer's desire to purchase the product and that as intention increases, so does the tendency to purchase. In this context, the concept of purchase

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intention provides a theoretical foundation for predicting consumer preferences in advance and guiding companies' strategic decisions accordingly.

Packaged food is often perceived as safer, fresher, and more hygienic (Anquez et al., 2022; Bou-Mitri et al., 2021; Wang, 2017), others perceive unpackaged foods as fresher, more sustainable, and comparably hygienic (Boßow-Thies et al., 2021). In recent years, the growing importance of health, hygiene, and environmental awareness in consumer behavior has significantly shaped the way individuals perceive and purchase food products, especially fresh fruits and vegetables. As urbanization and time constraints have increased, consumers have begun to rely more heavily on cues such as packaging, cleanliness, and perceived quality to guide their choices. In particular, packaging plays a dual role: it serves both as a physical protector against external contamination and as a symbolic signal of safety, freshness, and value. However, the perceived safety advantages of packaged products are increasingly being challenged by consumers who equate unpackaged goods with naturalness, sustainability, and minimal processing.

Although packaging is often intended to reassure consumers regarding hygiene and handling, research reveals a nuanced and sometimes contradictory landscape. While some consumers view packaging as a shield against microbial contamination, others perceive it as a potential source of health risks due to concerns over material safety and environmental harm. In the literature, the concept of “perceived contamination” is defined as consumers' subjective assessments that a product may be harmful to health due to external factors (e.g., microbiological risk, lack of hygiene, contact by others, environmental pollution) (Rozin & Fallon, 1987; Yeung & Morris, 2001). This perception encompasses not only concrete microbiological risks but also psychological and sensory dimensions; for example, a product's lack of clean appearance or excessive handling by others can trigger perceived contamination. In this study, the concept of perceived contamination was addressed in a way that encompassed consumers' perceptions of hygiene and microbiological risks regarding packaged and unpackaged fresh fruits and vegetables. Simultaneously, unpackaged products are frequently evaluated more favorably in terms of authenticity and freshness but may raise hygiene concerns due to exposure to handling and environmental factors. Thus, consumer perceptions of contamination risk serve as a critical psychological determinant in the decision-making process for fresh produce.

Price perception further complicates this landscape. On one hand, high prices may function as quality signals, reinforcing consumers' trust in the safety and superiority of packaged goods. On the other hand, consumers may exhibit price sensitivity, particularly in price-conscious markets, leading to decreased purchase intention despite favorable hygiene evaluations. Therefore, understanding how these seemingly competing evaluations—perceived contamination and perceived high price—interact is essential for both theory and practice.

The present study explores the impact of packaging on consumer buying intentions for fresh produce, specifically analyzing the intermediary role of contamination perception and the conditional effect of perceived high pricing. Growing consumer awareness of food safety and hygiene has increased the importance of packaging in the food sector. Packaged products are often viewed as more hygienic due to their protective barrier against handling and environmental contamination (Betta et al., 2011), while unpackaged produce is frequently perceived as more natural, fresh, and healthy (Kroese, 2017). The growing global population, evolving dietary habits, and increased health awareness have driven a significant rise in fresh fruit and vegetable production and consumption (Du et al., 2025). Due to their perishability and dietary importance, consumer choices regarding fresh produce warrant careful examination.

This study is based on three fundamental theoretical approaches. Firstly, according to perceived risk theory, consumers consider potential hygiene or contamination risks when evaluating a product, and these perceptions play a critical role in shaping purchase intent. Previous research has demonstrated that perceived contamination of food products directly impacts consumer purchasing decisions and can be influenced by trust and perceived risk (Ratasuk, 2023). Secondly, the price–quality perception approach suggests that high prices often signal quality and safety to consumers, but in markets with high price sensitivity, this can have the opposite effect. In the context of fresh fruit and vegetables, high price

perception may interact with hygiene considerations to influence purchasing decisions (Völckner & Hofmann, 2007; Zeithaml, 1988). Thirdly, the research is grounded in the S-O-R model, whereby the type of packaging acts as a stimulus that triggers psychological processes (organism) relating to hygiene and contamination risk, which determine behavioural responses (response), such as purchase intention (Mehrabian & Russell, 1974). Therefore, this theoretical framework provides a basis for the study's assumptions and explains how packaging, contamination perception, and price evaluations shape consumer decisions using a holistic approach.

Although extensive literature addresses packaging, contamination and price effects separately, there are few empirical studies examining these three factors holistically within the same conceptual model (Cheng et al., 2016; Koutsimanis et al., 2012; Zhang et al., 2018). More specifically, the mediating role of perceived contamination and the moderating role of high price perception in shaping purchase intention for fresh produce remain underexplored. While previous studies have examined consumer attitudes toward packaging, the psychological mechanisms underlying these attitudes—especially contamination concerns—have yet to be empirically tested in a mediation framework. Furthermore, the potential of perceived high prices to influence or disrupt these mechanisms, particularly in the context of packaged goods, has received minimal scholarly attention.

This study explores how packaging presence influences consumer perceptions and purchase intentions, specifically investigating whether perceived contamination mediates the relationship between packaging type (packaged vs. unpackaged) and purchase intention. Although food safety and packaging are well-studied, empirical research on contamination perception as a mediator remains scarce. This study addresses this gap by enhancing understanding of consumer risk perceptions in food marketing.

Another key factor affecting purchase intention is consumers' perception of high prices. Although premium pricing is often seen as an indicator of superior quality (Kurz et al., 2023; Völckner & Hofmann, 2007; Zeithaml, 1988), its interaction with contamination perception in the context of packaged foods remains underexplored. While high prices can signal enhanced hygiene and product integrity, this positive effect may not always hold. When consumers perceive a high risk of contamination despite packaging, the perceived value of paying a premium may diminish, weakening purchase intention. Conversely, when contamination concerns are low, high prices may reinforce perceptions of quality and safety, thereby strengthening purchase intention. Accordingly, this study proposes that perceived contamination moderates the relationship between high price perception and purchase intention for packaged produce.

In response to these gaps, the present study investigates how packaging type (packaged vs. unpackaged) influences consumer purchase intention for fresh fruits and vegetables, with a particular focus on the mediating role of perceived contamination and the moderating role of perceived high price perception. Through an integrated framework, this research aims to determine whether hygiene concerns and economic judgments independently or interactively affect consumers' willingness to buy fresh produce. Overall, the research aims to contribute to the consumer behavior and retail marketing literature by investigating the joint effects of packaging, contamination perception, and price evaluation on consumer decision-making.

The contributions of this research are threefold. First, it advances consumer behavior literature by empirically validating the role of perceived contamination as a psychological mediator in the packaging–purchase intention link. Second, it introduces a conditional framework by testing whether price sensitivity moderates this relationship, addressing a neglected area in pricing and packaging research. Third, the study provides actionable implications for retailers and marketers seeking to balance hygiene expectations with affordability, especially in price-sensitive markets. As food safety and sustainability continue to dominate consumer concerns, the findings of this research are timely and relevant for strategic decision-making in retail marketing.

The results intend to provide practical implications for marketers to optimize product presentation and foster consumer confidence in competitive retail environments. The remainder of this paper is structured as follows. In Section 2, a comprehensive literature review is presented, covering theoretical perspectives on

packaging, contamination perception, and price evaluation in consumer behavior. Section 3 outlines the methodology, including data collection procedures and measurement instruments. Section 4 presents empirical results, comprising factor analyses and hypothesis testing through mediation and moderation analyses. Section 5 discusses the findings in light of existing literature, followed by Section 6, which concludes the study with theoretical implications, practical recommendations, and suggestions for future research.

2. Literature Review and Hypothesis Development

2.1. Product Packaging, Unpackaging, and Purchase Intention

Packaging includes materials that enclose and protect products, serving functions such as containment, preservation, communication, and facilitating handling (Ampuero & Vila, 2006). Theoretically, packaging can influence consumer behaviour by signalling product quality and reducing perceived risk, thereby affecting purchase intentions (Duarte, 2024). For highly perishable fresh fruits and vegetables, packaging prevents moisture loss and quality degradation (Lentzou et al., 2021; Dwibedi et al., 2024). Beyond protection, packaging shapes perceptions of naturalness, quality, and safety (Binninger, 2017; Sabri et al., 2020) and acts as a marketing tool at the point of sale (Eldesouky & Mesias, 2014).

Despite the benefits of packaging, environmental and health concerns are leading some consumers to prefer unpackaged products, which are seen as more natural and environmentally friendly (Fuchs et al., 2015; Voon et al., 2011). For example, despite the increase in plastic packaging use in Germany (NABU, 2020), many consumers prefer unpackaged products to assess freshness through sensory perception (Peck & Childers, 2006; Song et al., 2020). Purchase intentions for fresh products are influenced not only by packaging design and appearance, but also by environmental awareness, price, and in-store cues (Koutsimanis, 2012; Qing et al., 2012). Zero-waste retail models such as Original Unverpackt in Germany reflect consumers' interest in sustainable shopping (Van Herpen et al., 2016) and demonstrate that packaging-free products can be an effective strategy for drawing attention to plastic pollution and encouraging environmentally conscious consumption behaviors (Jacobsen et al., 2022). However, the adoption of sustainable practices may be influenced by existing consumption habits and social norms. It should be noted that a study conducted in Sweden found that environmentally friendly personal norms strongly predicted packaging-free purchasing behavior (Fuentes et al., 2019). Supporting this, other studies also show that many consumers prefer unpackaged vegetables that allow for hand selection; this highlights the importance of direct interaction with the product in the decision-making process (Kapoor & Kumar, 2015). When these findings are considered together, it is evident that packaging-free initiatives are attractive to environmentally conscious consumers, but their effectiveness is shaped by both social norms and personal values. Based on this literature, two alternative hypotheses are proposed:

H₁: Packaged fresh produce leads to higher purchase intention than unpackaged.

H₂: Unpackaged fresh produce leads to higher purchase intention than packaged.

Two hypotheses have been deliberately formulated in opposite directions. H₁ proposes that packaging will increase purchase intention by enhancing product safety, ease of use, and perceived quality (Ampuero & Vila, 2006; Lentzou et al., 2021), H₂ argues that consumers perceive unpackaged products as more natural and fresh, thereby increasing purchase intention through environmental and sensory motivations (Peck & Childers, 2006; Voon et al., 2011). This approach is expected to contribute to the study's empirical testing of which effect is dominant.

2.2. Contamination, Hygiene Perception, and the Mediating Effect

Fresh produce is vulnerable to contamination during transport, storage, and handling (Behnke & Janssen, 2020; Cheng et al., 2016). Packaging acts as a barrier against contamination and limits direct handling, contributing to safety (Krishna et al., 2017). It protects against biological and chemical risks from environmental exposure (Yildirim et al., 2018). Consumers often reject products suspected of contamination (Morales & Fitzsimons, 2007), making packaging influential on hygiene perception and choice. However, packaging can also be a contamination source, especially recycled plastics (Pascall et al., 2022). Some

consumers perceive unpackaged products as more hygienic, challenging assumptions about packaging safety (Mesías et al., 2021; Ragaert et al., 2004). Accordingly, the following hypotheses are proposed:

H₃: Packaged products lead to lower perceived contamination than unpackaged.

H₄: Unpackaged products lead to lower perceived contamination than packaged.

Since perceived contamination influences purchase decisions, the study examines its mediating role:

H₅: Packaging influences purchase intention through perceived contamination.

H₆: Unpackaging influences purchase intention through perceived contamination.

2.3. High Price Perception and the Moderating Role of Perceived Contamination

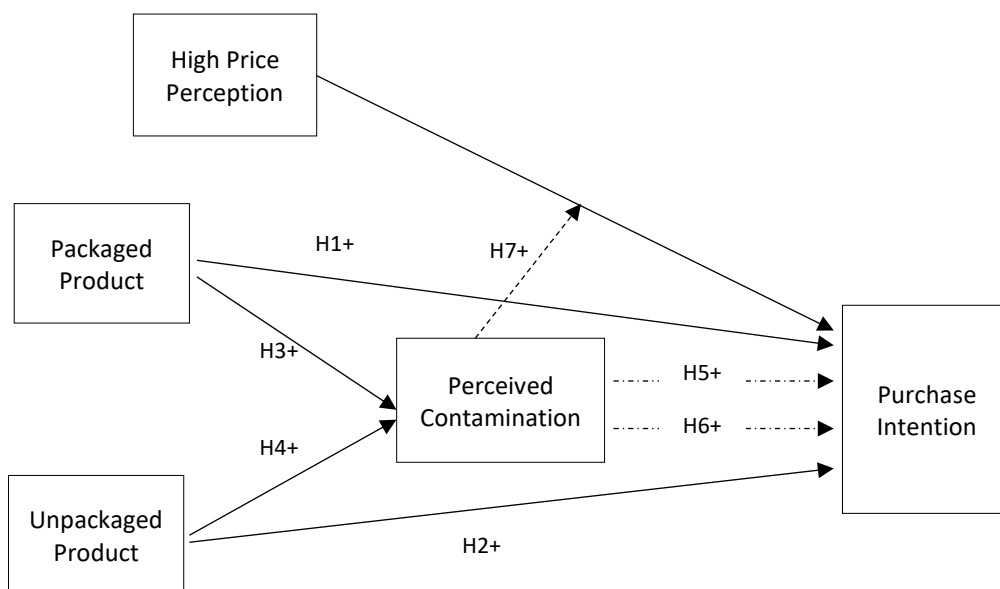
Price represents both a sacrifice and a signal of quality or status (Völckner, 2008). Packaged fresh produce typically commands higher prices, which many consumers consider justified due to perceived hygiene, safety, and convenience (Pollard et al., 2002; Herrmann et al., 2022). Research supports those consumers are willing to pay a premium for packaged products due to lower perceived contamination risks (Zhang et al., 2018; Maroušek et al., 2017; Röhr et al., 2005). However, the relationship between high price perception and purchase intention may not be uniform. García-Salirrosas et al. (2024) demonstrated that a strong brand image increases consumer confidence, thereby influencing purchase intent for healthy foods, and that loyal consumers are willing to pay higher prices for these products. Similarly, Zheng et al. (2024) revealed that perceived product value shapes consumers' purchase intentions through behavioral attitudes and that time pressure strengthens this effect; this demonstrates that both brand perception and perceived value are key factors in determining purchase intention.

When consumers perceive a high risk of contamination—even in packaged products—they may view the price premium as unjustified, weakening the positive influence of price on purchase intention. In contrast, when contamination concern is low, high price might be interpreted as a quality cue, reinforcing purchase motivation. This suggests that perceived contamination may moderate the effect of price perception on purchase intention. Accordingly, the following hypothesis is proposed:

H₇: Perceived contamination moderates the effect of high price perception on purchase intention for packaged produce.

Figure 1 illustrates the proposed research model.

Figure 1. The Research Framework and The Hypotheses



3. Method

3.1. Sample and Data Collection

A pre-survey with 45 participants was conducted to enhance external validity and clarify the questionnaire. Previous methodological literature suggests that pilot studies involving approximately 30-50 participants are sufficient to identify potential issues in survey design and ensure clarity of measurement items (Hertzog, 2008). Based on the feedback received, the survey was edited to improve its structure and wording. The final version of the questionnaire was distributed via Google Forms using a convenience sample, which was preferred due to practical considerations such as limited time, cost constraints, and ease of access to participants. Data was collected from adults (aged 18+) who had shopped in various regions of Türkiye between 7 March and 15 March 2025. The survey was created using Google Forms and sent to participants via WhatsApp. Initially, 439 responses were received, but four were excluded as they were incomplete or incorrect. The analyses were therefore performed on 435 valid responses. While convenience sampling does not represent the entire population, this sample size exceeds the threshold values generally recommended for hypothesis testing and multivariate statistical analyses (e.g. CB-SEM and PLS-SEM) (Memon et al., 2020). Therefore, the collected data are sufficient to test the study's hypotheses. However, the findings only apply to the participants in the sample and cannot be generalised to the entire population. Ethical approval for the research was obtained from the Scientific Research and Publication Ethics Committee of Muş Alparslan University (approval number 186360, decision date 6 March 2025).

Table 1 presents the sample's demographic profile, showing a balanced gender distribution (48.3% male, 51.7% female). Most participants were single (75.2%) and aged 18-25 (65.7%), indicating a predominantly young group. Students made up the largest occupational category (65.3%), followed by public (15.9%) and private sector employees (9.7%). Regarding income, 63.4% earned up to 22,000 TL monthly, while only 9.7% earned above 63,000 TL. The sample mainly reflects Türkiye's young, single, low-income population, especially students and early-career individuals.

Table 1. Demographic Distribution of The Respondents

Variable	Categories	Frequency (n)	Percentage (%)
Gender	Male	210	48.3
	Female	225	51.7
Marital Status	Single	327	75.2
	Married	108	24.8
Age	18–25 years	286	65.7
	26–35 years	54	12.4
	36–45 years	55	12.6
	46–55 years	19	4.4
	56–65 years	8	1.8
	66 and above	13	3.0
Occupation	Student	284	65.3
	Public sector employee	69	15.9
	Private sector employee	42	9.7
	Retired	8	1.8
	Self-employed	17	3.9
	Housewife	15	3.4
Income	Up to 22,000 TL	276	63.4
	22,001–43,000 TL	60	13.8
	43,001–63,000 TL	57	13.1
	Above 63,000 TL	42	9.7

3.2. Measurement Items

The constructs examined in this study were measured using multi-item scales adapted from previously validated instruments in the literature. Specifically, the study focuses on four core constructs: Product

perception, purchase intention, perceived contamination, and high price perception. Except for high price perception, each construct was evaluated across two distinct product contexts—packaged and unpackaged fresh fruits and vegetables—resulting in multiple sub-dimensions under each main construct (see Table 2). This structuring allows for comparative analysis of consumer responses across different packaging types.

Product perception was measured using items adapted from Bou-Mitri et al. (2021) and Kapoor and Kumar (2015), capturing both functional (e.g., hygiene, durability) and sensory (e.g., freshness, naturalness) aspects of the products. Two separate sub-dimensions were constructed: one for packaged products (three items) and one for unpackaged products (four items).

Purchase intention was assessed using scales developed by Dodds et al. (1991) and Spears and Singh (2004). The items evaluated the likelihood of consumers to purchase, repurchase, or recommend the products. This construct included four items for each product context, forming two sub-dimensions.

Perceived contamination was evaluated using five items for each product type, derived from Yeung and Morris (2001) and Rozin et al. (2015). The scale covered concerns related to microbial contamination, visual cleanliness, and psychological discomfort. As with the previous constructs, it was measured separately for packaged and unpackaged products.

High price perception was measured solely for packaged products, using three items drawn from Zeithaml (1988), Lichtenstein et al. (1993), and Monroe (1990). These items reflected consumer perceptions of price fairness, affordability, and overall value.

Initially, there were a total of 30 items. Following exploratory factor analysis (EFA), one item from the “perception of packaged fresh fruits and vegetables” scale and one item from the “high price perception of packaged fresh fruits and vegetables” scale were removed because their factor loadings were below 0.40 and therefore did not adequately represent their constructs (Kline, 2016). The final set consists of 28 items distributed across seven dimensions under four constructs.

All items were rated using a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). This scale enables participants to express their attitudes more accurately, thereby contributing to a more accurate explanation of variance. It is widely adopted in consumer behaviour research.

The combination and adaptation of items from different sources were conducted through conceptual alignment during the instrument development phase. For instance, product perception items combined indicators of hygiene and naturalness from both Bou-Mitri et al. (2021) and Kapoor and Kumar (2015). Contamination perception items merged microbial risk concerns (Yeung & Morris, 2001) with psychological cleanliness concerns (Rozin et al., 2015). Likewise, price perception items reflected both price fairness and affordability, drawing on Zeithaml (1988), Monroe (1990), and Lichtenstein et al. (1993).

The structural validity and dimensionality of the measurement model were subsequently confirmed through both exploratory and confirmatory factor analyses (CFA).

Table 2. Measurement Items and Studies on Packaged and Unpackaged Products

Construct	Dimensions (Subscales)	Number of Items	Sample Items	Sources
Product Perception	Packaged / Unpackaged	3 / 4	“Packaged products appear more hygienic”; “Unpackaged products look fresher and more natural”	Bou-Mitri et al. (2021); Kapoor & Kumar (2015)
Purchase Intention	Packaged / Unpackaged	4 / 4	“I would consider purchasing this product”; “I intend to buy this product again”	Dodds et al. (1991); Spears & Singh (2004)
Perceived Contamination	Packaged / Unpackaged	5 / 5	“This product may be contaminated”; “I am concerned about possible exposure to germs”	Yeung & Morris (2001); Rozin et al. (2015)
High Price Perception	Packaged only	3	“This product is overpriced”; “This product does not offer value for money”	Zeithaml (1988); Lichtenstein et al. (1993); Monroe (1990)

The dimensions presented in Tables 2 through 7 (such as packaged and unpackaged forms) correspond to sub-dimensions within the overarching constructs introduced earlier. These do not represent separate or independent scales. This hierarchical organization is consistent with the conceptual framework outlined in Section 3.1 and is uniformly reflected throughout the main text and all relevant tables.

4. Results

The analysis of the collected data was conducted using the Jamovi software (version 2.3.28). The scale's internal consistency reliability was assessed using Cronbach's alpha, followed by evaluations of data normality. It was confirmed that the dataset was indeed suitable for exploratory factor analysis (EFA) through the implementation of two key procedures. Firstly, the Kaiser–Meyer–Olkin (KMO) measure was utilised to assess the sample adequacy. Secondly, the Bartlett's test of sphericity was employed to determine the sample's multivariate normal distribution. Consequently, confirmatory factor analysis (CFA) was conducted to validate the measurement model. Subsequently, regression-based mediation and moderation analyses were conducted in order to test the hypotheses.

4.1. Normality Test

The Shapiro–Wilk test was used to assess normality for all main structures. Although the test was significant ($p < 0.001$), this is frequently observed in large samples ($n = 435$). Skewness and kurtosis values remained within the ± 1.5 range, indicating that normality was acceptable for parametric analyses (Tabachnick & Fidell, 2013). The detailed results are presented in Table 3.

Table 3. Normality Test

Variables	Std.Error	Skewness	Kurtosis
Perception of Packaged Fresh Fruits and Vegetables	1.50	-0.134	-0.584
Perception of Unpackaged Fresh Fruits and Vegetables	1.44	0.116	-0.483
Purchase Intention for Packaged Fresh Fruits and Vegetables	1.54	-0.362	-0.541
Purchase Intention for Unpackaged Fresh Fruits and Vegetables	1.51	-0.222	-0.631
Perceived Contamination for Packaged Fresh Fruits and Vegetables	1.47	-0.277	-0.364
Perceived Contamination for Unpackaged Fresh Fruits and Vegetables	1.47	-0.024	-0.499
High Price Perception for Packaged Fresh Fruits and Vegetables	1.45	-0.484	-0.076

4.2. Findings of the Factor and Reliability Analysis of the Scales

Exploratory factor analysis (EFA) was conducted to distil observed variables into latent constructs by examining item intercorrelations (Uyanık, 2019). In accordance with Altunışık et al. (2005), the sample size exceeded the recommended minimum of ten times the number of items, with 435 respondents for 30 items. The suitability of the dataset for factor analysis was confirmed by the Kaiser–Meyer–Olkin (KMO) measure and the Bartlett's test of sphericity ($KMO > 0.70$; $p < 0.05$). Principal component analysis with Varimax rotation was applied to extract factor structures across the constructs. Items demonstrating factor loadings below 0.50 were omitted in order to enhance construct validity. The reliability analysis yielded Cronbach's alpha coefficients in excess of 0.70 for all scales, thereby indicating satisfactory internal consistency. A comprehensive overview of these findings is provided in Table 4.

As shown in Table 4, EFA revealed distinct factors for perceptions of packaged and unpackaged products. Three items loaded onto the packaged perception factor, and four onto the unpackaged. One item was removed due to cross-loading. Cronbach's alpha values were 0.815 and 0.783, indicating satisfactory reliability (Bland & Altman, 1997). All extracted factors had eigenvalues above 1, and the total variance explained was 54.1%, surpassing the 40% threshold (Kline, 2014). A KMO value of 0.788 indicates moderate sampling adequacy (Kaiser, 1974). A significant Bartlett's test ($p = 0.001$) also confirms the suitability of the data for factor analysis (Çokluk et al., 2010).

Table 4. Results of the Exploratory Factor Analysis and Reliability Analysis for Perception of Packaged and Unpackaged Fresh Fruits and Vegetables

Factors	Items	Factor Loadings	Explained Variance (%)	Reliability Analysis	
Scale for Perception of Packaging of Fresh Fruits and Vegetables	2- The packaging of fresh fruits and vegetables contributes to the hygienic quality of the product.	0.860	27.2	0.815	
	3- The packaging of fresh fruits and vegetables preserves the freshness and naturalness of the product.	0.744			
	1- The packaging of fresh fruits and vegetables indicates that the product has been processed with care.	0.657			
Scale for Perception of Non-Packaging of Fresh Fruits and Vegetables	7- The lack of packaging for fresh fruits and vegetables indicates that the product preserves its freshness and naturalness.	0.785	26.9	0.783	
	8- The lack of packaging for fresh fruits and vegetables better protects the product from external factors (such as rotting, spoilage, etc.).	0.663			
	6- The lack of packaging for fresh fruits and vegetables contributes to the hygienic quality of the product.	0.657			
	5- The lack of packaging for fresh fruits and vegetables indicates that the product is presented in its natural form.	0.557			
KMO: 0.788	Bartlett's Test: χ^2 1052	Eigenvalue greater than 1	df 21	54.1	Sig. < 0.001

Table 5 presents EFA and reliability results for purchase intention. Two factors emerged—packaged and unpackaged—each represented by four items. Cronbach's alphas were 0.882 and 0.870, reflecting high internal consistency. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was 0.852, indicating high suitability for factor analysis (Kaiser, 1974). Bartlett's test was also significant ($p = 0.001$), supporting construct validity and the appropriateness of further analysis. The total variance explained was 64.3%.

Table 5. Results of the Exploratory Factor and Reliability Analysis for Purchase Intention of Packaged and Unpackaged Fresh Fruits and Vegetables

Factors	Items	Factor Loadings	Explained Variance %	Reliability Analysis	
Scale for Purchase Intention of Packaged Fresh Fruits and Vegetables	11- Packaged fresh fruit and vegetable products seem like an ideal choice for me.	0.839	33.1	0.882	
	12- I am likely to purchase packaged fresh fruit and vegetable products in the future.	0.784			
	10- If I need it, I would definitely purchase packaged fresh fruit and vegetable products.	0.779			
	9- I am considering purchasing packaged fresh fruit and vegetable products.	0.745			
Purchase Intention Scale for Unpackaged Fresh Fruits and Vegetables	14- If I need them, I will definitely purchase unpackaged fresh fruits and vegetables.	0.782	31.2	0.870	
	16- It is highly likely that I will purchase unpackaged fresh fruits and vegetables in the future.	0.780			
	15- Unpackaged fresh fruits and vegetables appear to be an ideal choice for me.	0.766			
	13- I am considering purchasing unpackaged fresh fruits and vegetables.	0.733			
KMO: 0.852	Bartlett's Test: χ^2 1879	Eigenvalue greater than 1	df 28	64.3	Sig. < 0.001

As shown in Table 6, EFA results categorized perceived contamination into two factors—packaged and unpackaged—each with five items. Cronbach's alpha values were 0.893 and 0.887, confirming strong internal consistency (Bland & Altman, 1997). Both factors had eigenvalues above 1 and explained 63.03% of total variance, exceeding the 40% threshold (Kline, 2014). A KMO value of 0.866 indicates a high level of sampling

adequacy (Kaiser, 1974) and a significant Bartlett's test ($p = 0.001$), confirming that the data are suitable for factor analysis (Çokluk et al., 2010). These findings validate the scale's reliability and structural integrity.

Table 6. Exploratory Factor and Reliability Analysis Results for Perceived Contamination of Packaged and Unpackaged Fresh Fruits and Vegetables

Factors	Items	Factor Loadings	Explained Variance%	Reliability Analysis
Perceived Contamination Scale for Packaged Fresh Fruits and Vegetables	20- Packaged fresh fruits and vegetables appear to be safe from a health perspective.	0.843	32.28	0.893
	21- I believe packaged fresh fruits and vegetables are suitable for safe consumption.	0.835		
	18- I believe packaged fresh fruits and vegetables are stored under hygienic conditions.	0.799		
	19- I think packaged fresh fruits and vegetables are not physically contaminated.	0.730		
	17- Packaged fresh fruits and vegetables appear to be clean.	0.692		
Perceived Contamination Scale for Unpackaged Fresh Fruits and Vegetables	26- I believe unpackaged fresh fruits and vegetables are suitable for safe consumption.	0.817	30.75	0.887
	25- Unpackaged fresh fruits and vegetables appear to be safe from a health perspective.	0.814		
	23- I believe unpackaged fresh fruits and vegetables are stored under hygienic conditions.	0.760		
	24- I think unpackaged fresh fruits and vegetables are not physically contaminated.	0.724		
	22- Unpackaged fresh fruits and vegetables appear to be clean.	0.721		
KMO: 0.866 Bartlett's Test: χ^2 2552 Eigenvalue greater than 1		df 45	63.03	Sig. < 0.001

The exploratory factor analysis (EFA) results in Table 7 indicate that high price perception for packaged products was represented by three distinct items. Item 30— “The price of packaged fresh fruits and vegetables negatively affects my purchasing decision”—was excluded due to cross-loading, which threatened construct validity. The scale exhibited acceptable reliability, reflected by a Cronbach's alpha of 0.783. The factor structure proved stable, with eigenvalues greater than 1 and explaining 55% of the total variance. The Kaiser–Meyer–Olkin (KMO) measure of 0.699 indicated moderate sample adequacy. Bartlett's Sphericity test was also significant ($p = 0.001$), confirming the data's suitability for factor analysis (Kaiser, 1974).

Table 7. Exploratory Factor and Reliability Analysis Results for High Price Perception of Packaged Fresh Fruits and Vegetables

Factors	Items	Factor Loadings	Explained Variance (%)	Reliability Analysis		
Scale for High Price Perception of Packaged Fresh Fruits and Vegetables	28- The price of packaged fresh fruits and vegetables is high relative to their quality level.	0.774	55	0.783		
	27- The price of packaged fresh fruits and vegetables is higher compared to unpackaged ones.	0.773				
	29- The price of packaged fresh fruits and vegetables strains my budget.	0.674				
KMO: 0.699	Bartlett's Test: χ^2 371	Eigenvalue greater than 1	df 3	55	Sig.	< 0.001

4.3. Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) was performed to evaluate the adequacy of the proposed measurement model in representing the observed data, using model fit indices and item loadings. As a hypothesis-driven technique, CFA serves to confirm the construct validity of the underlying factor structure

(Gürbüz, 2019). As presented in Table 8, CFA results showed that all standardized factor loadings were statistically significant ($p < 0.001$), confirming each item's contribution to its corresponding latent construct. However, one item from the unpackaged product perception scale—Item 5 (“The absence of packaging for fresh fruits and vegetables indicates that the product is presented in a natural way”)—was removed due to poor model fit. After this modification, the revised model demonstrated acceptable fit indices, supporting the construct validity and adequacy of the measurement model.

Table 8. Confirmatory Factor Analysis of Packaged and Unpackaged Fresh Fruits and Vegetables Perception, Purchase Intention, Perceived Contamination, and High Price Perception of Packaged Products

Fit Measures	Good Fit	Acceptable Fit	Proposed Model
X ² /df	$0 < \chi^2/df < 3$	$3 < \chi^2/df < 4-5$	2,762
RMSEA	$0 < RMSEA < 0.05$	$0.05 \leq RMSEA \leq 0.10$	0.064
NFI	$0.95 \leq NFI \leq 1$	$0.90 \leq NFI \leq 0.95$	0.888
CFI	$0.97 \leq CFI \leq 1$	$0.95 \leq CFI \leq 0.97$	0.925
IFI	$0.95 \leq IFI \leq 1$	$0.90 \leq IFI \leq 0.95$	0.925
GFI	$0.95 \leq GFI \leq 1$	$0.90 \leq GFI \leq 0.95$	0.931
AGFI	$0.90 \leq AGFI \leq 1$	$0.85 \leq AGFI \leq 0.9$	0.908
SRMR	≤ 0.08	$0.08 \leq SRMR \leq 0.10$	0.039

For all values, $p < 0.001$

Source: Hair et al. (2014); Meydan & Şeşen, (2011); Çetin & Basım, (2011).

Although certain model fit indices, including the normed fit index (NFI) and the comparative fit index (CFI), exhibited slight declines below the conventional threshold of 0.90, these indices-maintained proximity within the acceptable range. In accordance with the recommendations of Hair et al. (2014), Hu and Bentler (1999), and Schermelleh-Engel et al. (2003), these values are still considered to be indicative of acceptable model fit, particularly when supported by satisfactory results on other indices, such as RMSEA and the Tucker-Lewis Index (TLI). Consequently, the findings of the study demonstrate that the measurement model exhibits a satisfactory fit with the data and is deemed appropriate for subsequent structural analysis.

As demonstrated in Table 9, the average variance extracted (AVE) values surpassed the 0.50 threshold, thereby signifying adequate construct validity (Bagozzi & Yi, 1988). Furthermore, in accordance with the criteria established by Fornell and Larcker (1981), the composite reliability (CR) values were found to exceed their respective average variance extracted (AVE) values, thereby substantiating the internal consistency and convergent validity of the constructs.

Table 9. Reliability, CR, and AVE Values for Scales Related to Packaged and Unpackaged Fresh Fruits and Vegetables Perception, Purchase Intention, Perceived Contamination, and High Price Perception of Packaged Fresh Fruits and Vegetables

Variable	α (Reliability)	(CR)	AVE
Perception of Packaged Fresh Fruits and Vegetables	0.815	0.822	0.603
Perception of Unpackaged Fresh Fruits and Vegetables	0.777	0.775	0.536
High Price Perception of Packaged Fresh Fruits and Vegetables	0.783	0.783	0.551
Purchase Intention for Packaged Fresh Fruits and Vegetables	0.882	0.884	0.653
Purchase Intention for Unpackaged Fresh Fruits and Vegetables	0.870	0.870	0.626
Perceived Contamination of Packaged Fresh Fruits and Vegetables	0.893	0.893	0.627
Perceived Contamination of Unpackaged Fresh Fruits and Vegetables	0.887	0.885	0.610

4.4. Regression, Mediator, and Moderator Analyses Between Variables

To examine the relationship between the perception of packaged fresh fruits and vegetables (independent variable) and the purchase intention of packaged products (dependent variable), a linear regression analysis was conducted (Table 10). According to Neter et al. (1983), regression analysis is an appropriate method for testing predictive relationships between variables. The findings yielded an F value of 347 with a p-value of < 0.001 , thereby indicating that the regression model is statistically significant (Andy, 2009).

The correlation coefficient (R) was 0.667, suggesting a strong and positive relationship between perception and purchase intention (Evans, 1996). The coefficient of determination (R^2) was 0.445, indicating that 44.5% of the variance in purchase intention could be attributed to the perception of packaged products. According to Tabachnick and Fidell (2013), this level of explanatory power indicates a substantial and meaningful effect.

Table 10. Linear Regression Analysis of Purchase Intention for Packaged Fresh Fruits and Vegetables

Variables	Std.Error	β	t	p
Constant (Purchase Intention for Packaged Fresh Fruits and Vegetables)	0.1491	1.628	10.9	< 0.001
Perception of Packaged Fresh Fruits and Vegetables	0.0335	0.624	18.6	< 0.001
R= 0.667 R^2 = 0.445 F= 347				

As presented in Table 11, the regression analysis examining the relationship between the perception of unpackaged fresh fruits and vegetables and purchase intention for unpackaged products yielded a statistically significant result ($F = 107$, $p < 0.001$). The correlation coefficient ($R = 0.446$) indicated a moderate positive relationship, while the coefficient of determination ($R^2 = 0.199$) showed that 19.9% of the variance in purchase intention is explained by perceptions of unpackaged products. This suggests a moderate level of explanatory power, consistent with established benchmarks.

Table 11. Linear Regression Analysis of Purchase Intention for Unpackaged Fresh Fruits and Vegetables

Variables	Std.Error	β	t	p
Constant (Purchase Intention for Unpackaged Products)	0.1690	2.417	14.3	< 0.001
Perception of Unpackaged Fresh Fruits and Vegetables	0.0419	0.434	10.4	< 0.001
R= 0.446 R^2 = 0.199 F= 107				

Based on the analysis results presented in Table 10 and Table 11, Hypothesis H_1 (Packaged fresh produce leads to higher purchase intention compared to unpackaged produce in a retail store) is supported. In contrast, Hypothesis H_2 (Unpackaged produce leads to higher purchase intention compared to packaged fresh produce in a retail store) is not supported and thus rejected. To assess consumers' perception of contamination regarding packaged fresh fruits and vegetables, a regression analysis was conducted (Table 12). The model was statistically significant ($F = 316$, $p < 0.001$), with a strong positive correlation ($R = 0.649$) between the variables. The coefficient of determination ($R^2 = 0.422$) indicates that 42.2% of the variance in perceived contamination is explained by the model, reflecting a robust and meaningful association.

Table 12. Results of Linear Regression Analysis for the Effect of Product Perception on Consumer Contamination Perception Regarding Packaged Fresh Fruits and Vegetables

Variables	Std.Error	β	t	p
Constant (Consumer Perception of Contamination Related to Packaged Fresh Fruits and Vegetables)	0.1454	1.800	12.4	< 0.001
Perception of Packaged Fresh Fruits and Vegetables	0.0327	0.580	17.8	< 0.001
R= 0.649 R ² = 0.422 F= 316				

As shown in Table 13, a regression analysis was conducted to examine consumer perceptions of contamination related to unpackaged fresh fruits and vegetables. The model was statistically significant ($F = 143$, $p < 0.001$). The correlation coefficient ($R = 0.498$) indicated a moderate positive relationship, while the coefficient of determination ($R^2 = 0.248$) showed that 24.8% of the variance in contamination perception is explained by the model. These results suggest a statistically significant and moderately strong association.

Table 13. Results of Simple Linear Regression Analysis for the Effect of Product Perception on Contamination Perception Regarding Unpackaged Fresh Fruits and Vegetables

Variables	Std.Error	β	t	p
Constant (Consumer Perception of Contamination Related to Unpackaged Products)	0.1592	2.002	12.6	< 0.001
Unpackaged Fresh Fruits and Vegetables	0.0395	0.427	11.9	< 0.001
R= 0.498 R ² = 0.248 F= 143				

Based on the results in Tables 12 and 13, H_3 (stating that packaged fresh fruits and vegetables lead to lower perceived contamination) was supported. In contrast, H_4 (suggesting the opposite) was rejected. As shown in Table 14, perceived contamination significantly mediated the relationship between packaging type and purchase intention ($p < 0.001$). Bootstrap analysis (5,000 resamples, 95% CI) confirmed the indirect effect's significance, with no zero in the confidence interval. This indirect effect explained 48.6% of the total effect, indicating strong mediation (Hayes, 2017). Therefore, H_5 was supported.

Table 14. Analysis of the Mediation Role of Perceived Contamination in the Effect of Packaged Fresh Fruits and Vegetables on Purchase Intention

Effect	Label	β	SE	95% Confidence Interval		Z	p	%
				Lower	Upper			
Indirect	a x b	0.303	0.0474	0.215	0.399	6.40	<0.001	48.6
Direct	c	0.321	0.0589	0.203	0.436	5.45	<0.001	51.4
Total	c + a x b	0.624	0.0358	0.552	0.692	17.45	<0.001	100.0

As shown in Table 15, perceived contamination significantly mediated the relationship between unpackaged fresh fruits and vegetables and purchase intention ($p < 0.001$). Bootstrap analysis (5,000 iterations, 95% CI) confirmed this effect, with the confidence interval excluding zero. The mediation accounted for 57.6% of the total effect, indicating strong mediation (Hayes, 2017). Thus, H_6 was supported.

Table 15. Analysis of the Mediation Role of Perceived Contamination in the Effect of Unpackaged Fresh Fruits and Vegetables on Purchase Intention

Effect	Label	β	SE	95% Confidence Interval		Z	p	%
				Lower	Upper			
Indirect	a x b	0.250	0.0358	0.1832	0.323	6.98	<0.001	57.6
Direct	c	0.184	0.0510	0.0846	0.286	3.61	<0.001	42.4
Total	c + a x b	0.434	0.0497	0.3362	0.530	8.74	<0.001	100.0

Table 16 shows that the moderating effect of perceived contamination on the relationship between high price perception and purchase intention for packaged fresh produce was not significant ($p = 0.490$). The bootstrap analysis (5,000 resamples, 95% CI) confirmed this, as the confidence interval included zero. Therefore, H_7 (stating that perceived contamination moderates this relationship) was rejected.

Table 16. Analysis of the Moderating Role of Perceived Contamination in the Effect of High Price Perception on Purchase Intention for Packaged Fresh Fruit and Vegetable Products

	β	SE	95% Confidence Interval		Z	p
			Lower	Upper		
High Price Perception	0.1532	0.0546	0.475	0.2616	2.804	<0.005
Perceived Contamination for Packaged Products	0.6596	0.0565	0.5466	0.7678	11.679	<0.001
High Price Perception * Perceived Contamination for Packaged Products	-0.0151	0.0219	-0.0621	0.0238	-0.690	0.490

Table 17 presents a summary of the hypotheses tested in this study and their outcomes based on the statistical analyses conducted. Each hypothesis is evaluated as accepted or rejected in accordance with the results obtained from regression, mediation, and moderation analyses.

Table 17. Acceptance and Rejection Status of Hypotheses Based on Analysis Results

Hypotheses	Accepted	Rejected
H ₁ : In a retail store, packaged fresh fruits and vegetables will lead to a higher purchase intention compared to unpackaged fresh fruits and vegetables.	X	
H ₂ : In a retail store, unpackaged fresh fruits and vegetables will lead to a higher purchase intention compared to packaged fresh fruits and vegetables.		X
H ₃ : In a retail store, packaged fresh fruits and vegetables will lead to a lower perceived level of contamination compared to unpackaged fresh fruits and vegetables.	X	
H ₄ : In a retail store, unpackaged fresh fruits and vegetables will lead to a lower perceived level of contamination compared to packaged fresh fruits and vegetables.		X
H ₅ : In a retail store, packaged fresh fruits and vegetables will lead to a higher purchase intention through the mediating effect of perceived contamination.	X	
H ₆ : In a retail store, unpackaged fresh fruits and vegetables will lead to a higher purchase intention through the mediating effect of perceived contamination.	X	
H ₇ : For packaged fresh fruits and vegetables, perceived high price will have an effect on purchase intention, moderated by perceived contamination.		X

5. Discussion

The findings provide valuable insights into consumer behaviour concerning fresh fruit and vegetable purchases, particularly regarding packaging type, perceived contamination, and price sensitivity. Consistent with H_1 , consumers exhibited significantly greater purchase intention for packaged fresh fruits and vegetables compared to unpackaged alternatives. In contrast to H_1 , which was supported, H_2 —suggesting that unpackaged fresh produce would generate higher purchase intention than packaged alternatives—was not supported by the results. This finding challenges studies that emphasize consumer preference for naturalness, environmental sustainability, and tactile evaluation in unpackaged products (Bořow-Thies et al., 2021; Fuchs et al., 2015; Peck & Childers, 2006). While these studies highlight positive attitudes toward unpackaged formats, the present research suggests that hygiene-related concerns may override such benefits in actual purchase decisions, particularly in a post-pandemic context where food safety perception has intensified. Similarly, the rejection of H_4 —claiming that unpackaged products would yield lower perceived contamination than packaged ones—further emphasizes that unpackaged formats are still perceived as more vulnerable to contamination. This contradicts some earlier findings suggesting that consumers may consider unpackaged items equally or even more hygienic due to their “naturalness” (Mesías et al., 2021; Ragaert et al., 2004). These outcomes may be influenced by cultural and contextual factors. For example, post-pandemic increases in consumer sensitivity to hygiene and food safety may have led to a preference for packaged products (H_2). Meanwhile, local consumer habits and the psychological protective function of packaging may have further limited the intention to purchase unpackaged items (H_4). This

discussion highlights how contextual factors and crisis conditions can influence consumer behaviour in the fresh food sector. The acceptance of H₃ instead confirms that packaging still functions as a strong heuristic cue for hygiene and food safety (Krishna et al., 2017; Yildirim et al., 2018), reaffirming its psychological protective role in consumer evaluations.

Taken together, these results indicate that despite rising ecological awareness and positive affect toward unpackaged products, packaging remains a dominant factor shaping both perceived contamination and purchase intention. The discrepancy between environmental attitudes and behavioral outcomes underlines the enduring impact of perceived hygiene risk, especially in contexts involving raw and perishable goods such as fruits and vegetables.

This outcome corroborates previous studies emphasizing the protective and hygienic advantages of packaging (Bou-Mitri et al., 2021; Eldesouky & Mesias, 2014; Yeo et al., 2020), especially for products consumed raw. Packaged produce is generally associated with reduced handling and contamination, which enhances consumer trust and willingness to buy.

The study further confirmed the mediating role of perceived contamination in influencing purchase intention, thereby supporting hypotheses H₅ and H₆. In both the contexts of packaged and unpackaged products, perceived contamination was found to be a significant mechanism explaining the relationship between product form and consumer purchase intention. Of particular significance was the observation that the mediation effect was more pronounced for unpackaged products. This finding suggests that the absence of packaging can serve to amplify contamination concerns. These findings align with previous psychological research emphasizing contamination as a key factor driving consumer avoidance behaviour (Morales & Fitzsimons, 2007; Rozin et al., 2015). These results imply that consumers exhibit greater sensitivity to contamination risks when products lack a visible protective layer, reinforcing the importance of packaging as a signal of safety.

Contrary to hypothesis H₇, the moderating role of perceived contamination in the relationship between high price perception and purchase intention was not supported. Although high price perception negatively influenced consumers' willingness to purchase packaged produce, this effect remained consistent irrespective of contamination perception levels. This suggests that while consumers acknowledge the importance of hygiene, pricing concerns may outweigh the perceived hygienic benefits during the purchase decision process. Practically, consumers may recognize the sanitary advantages provided by packaging but may be reluctant to pay premium prices when affordability is a key consideration. These findings contrast with prior assumptions that the hygienic value of packaging can justify higher pricing (Herrmann et al., 2022; Zeithaml, 1988).

Overall, this study contributes to the existing literature by elucidating the distinct yet interrelated roles of packaging, contamination perception, and price sensitivity in shaping consumer purchase intentions. The findings underscore that packaging predominantly affects purchase decisions by mitigating contamination-related risks rather than serving as an economic justification. Furthermore, the study demonstrates that contamination perceptions function as cognitive mechanisms influencing consumer behavior, while price perceptions exert direct economic pressure, with minimal moderating impact from perceived hygiene factors.

6. Conclusion

This study examined the impact of packaging type (packaged vs. unpackaged) on consumer purchase intentions for fresh fruits and vegetables, emphasizing the mediating role of perceived contamination and the moderating role of high price perception. The findings revealed that consumers exhibit stronger purchase intentions for packaged products, highlighting packaging's visual and hygienic appeal in food retail. Perceived contamination significantly mediates the packaging–purchase intention relationship for both packaged and unpackaged items, with a stronger mediation effect for unpackaged products, reflecting heightened sensitivity to hygiene risks without packaging. Although high price perception negatively influences purchase

intention for packaged products, perceived contamination does not moderate this effect, indicating consumers are reluctant to pay premium prices based solely on perceived hygiene benefits.

These findings extend consumer behaviour theories by underscoring the pivotal role of hygiene-related risk perception in retail purchase decisions. The demonstrated strong mediation effect of perceived contamination highlights its significance as a key psychological driver of purchase intention. Moreover, the results challenge earlier assumptions about the interaction between price and perceived risk, indicating that these factors influence consumer decisions more independently than previously thought.

Emphasize hygiene-focused packaging features (e.g., sealed, tamper-proof, sanitized) on product labels and point-of-sale displays to boost consumer trust and encourage purchases. For unpackaged product sections, implement measures such as providing gloves, hand sanitizers, or physical barriers to visibly reduce contamination concerns and enhance perceived cleanliness. Since perceived contamination does not alleviate price sensitivity, prioritize non-price incentives—like promotions and loyalty programs—over relying solely on hygienic benefits to justify premium pricing. Craft integrated marketing communications that simultaneously address consumer concerns about hygiene and affordability, especially targeting price-conscious customer segments.

This study presents certain limitations that should be acknowledged. The reliance on convenience sampling, primarily capturing a young, single, and low-income cohort, restricts the extent to which the findings can be generalized to broader populations beyond this demographic segment. Moreover, the exclusive focus on fresh fruits and vegetables restricts the applicability of results to other food categories such as dairy, meat, or packaged goods. Future research should aim to include more demographically and geographically diverse samples, as well as a broader range of product types. Additionally, incorporating moderating variables such as consumer trust, food safety awareness, and environmental concern may offer deeper insights into consumer perceptions. Given the growing relevance of digital food retail, examining how packaging and hygiene cues are interpreted in online environments represents another valuable avenue for future inquiry.

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