

How can consumer satisfaction with safe vegetables be improved in the modern retail system in emerging markets? Evidence from Vietnam

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Abstract:

Consumer satisfaction with safe vegetables plays a crucial role in shaping consumer behaviour and the performance of supply chain actors in modern retail outlets in Vietnam. However, empirical evidence on the determinants of such satisfaction remains limited. This study aims to identify the key factors influencing consumer satisfaction with safe vegetables in the modern retail context. Using Structural Equation Modelling (SEM) based on a survey of 250 consumers in Hanoi, with a response rate of 87.6%, the results highlight that brand trust is a central driver of satisfaction within modern vegetable retail systems. In addition, product attributes positively influence satisfaction, while store image indirectly enhances satisfaction through brand trust. These findings suggest that building brand trust, improving brand familiarity, creating appealing store images (i.e. through advertising, attractive decorations, and friendly staff), and enhancing product attributes (i.e. fresh appearance, attractive packaging, and reasonable prices) are essential strategies for strengthening consumer satisfaction with safe vegetables in Vietnam.

Keywords: modern outlets, retail, safe vegetables, satisfaction, Vietnam.

Classification numbers: 2.1, 2.2, 2.3

1. Introduction

Consumer concern about food safety has become a central feature of food purchase behaviour in many emerging markets, driven by recurring food-safety incidents, rapid urbanisation, and changing retail structures that increase both exposure and perceived risk [1].

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In Vietnam, food safety concerns have attracted great attention from the government, scholars, and the public [2, 3]. Supermarkets and modern retail channels have expanded rapidly in many cities, offering traceability and certification that can reduce information asymmetries for credence attributes such as “safe” or “certified” vegetables, yet adoption of branded safe food remains uneven due to price premiums, limited supply chains, and persistent consumer scepticism [4]. Empirical and review studies indicate that consumers rely on a mix of observable cues (appearance, packaging, price) and institutional signals (labels, certifications, retailer reputation) to infer product safety, with brand and store trust emerging as pivotal mediators between these signals and satisfaction or purchase decisions [5, 6]. Recent consumer-level surveys and policy reports also emphasise the need for integrated approaches, combining supply-side improvements, credible certification, and consumer education, to strengthen trust and thereby increase uptake of safe-food products in emerging economies.

In recent years, rapid economic growth and shifting consumption patterns have propelled the expansion of modern retail channels - such as supermarkets, hypermarkets, and convenience stores - in many developing countries, often displacing smaller traditional retailers [7, 8]. In the food and grocery sector, these modern formats are increasingly driven by consumer demands for safety, quality, and convenience, reshaping how food is purchased in emerging markets [5, 9].

In Vietnam, there has been a profound transformation from the traditional food market to modernised retail outlets since the early 2000s [10]. The recent rapid modernisation of the Vietnamese economy in general, and the food industry in particular, has fostered the striking expansion of food retail systems in major cities such as Hanoi and Ho Chi Minh City. In the early 2000s, there were few supermarkets and other modern retail formats in Vietnam [10, 11]. Over the past two decades, however, the number of supermarkets and other modern retail outlets (i.e., convenience stores) has increased tremendously, with over 330 supermarkets and 5,228 convenience stores as of March 2020 [12]. Despite the expansion of modern retail outlets, the market share of food distributed through such outlets compared with traditional markets remains modest [13]. According to a survey by the University of Adelaide (2018) [14], food expenditure in traditional markets accounted for 77-99% of total food expenditure in Vietnam.

Consumers in emerging markets such as Vietnam prefer fresh food in traditional wet markets rather than in modernised outlets [2, 3]. Thus, it is vital to improve consumer satisfaction with food products in these modern retail formats to expand the market share of fresh food.

So far, few prior studies have examined the development of the modern retail system (e.g., supermarkets) and compared its performance with traditional markets in distributing food in Vietnam [13, 15]. Recently, F. Evangelista, et al. (2019) [16] examined consumer store choices for non-food and processed food products between traditional markets and supermarkets in the country. The development of safe food, such as safe vegetables that bear official safety certifications (i.e., hygiene safety certification, Vietnam Good Agricultural Practice - VietGAP, and organic certifications), has received considerable attention from the government and food sector actors [13, 16]. However, the market share of safe vegetables accounts for less than 10% of total vegetable sales, although they are expected to become dominant in modern retail channels under the Vietnamese government's efforts [13, 17]. H.M. Ngo, et al. (2019) [13] estimated that around 80% of safe vegetables were distributed via traditional markets. Barriers to motivating consumers to buy safe vegetables in modern retail formats (supermarkets and convenience stores) have been identified, including high prices and shopping habits favouring traditional markets for fresh produce [13], as well as consumer trust [3, 17]. Meanwhile, other important factors for increasing food sales volume and retailer turnover, such as consumer satisfaction with food products, remain underexplored.

Based on the review of existing literature above, this study is motivated by the following research questions. First, what are the key determinants of consumer satisfaction in modern vegetable retail systems in developing countries? Second, how do brand trust and brand familiarity affect consumer satisfaction with safe vegetables in modern retail systems? Third, how do product attributes and store image jointly influence consumer satisfaction with safe vegetables in modern retail outlets? Finally, how can modern retailers enhance consumer satisfaction with safe vegetables to expand their market share?

To the best of our knowledge, very little work has examined consumer satisfaction with safe vegetables in modern retail outlets (i.e., convenience stores and supermarkets) in Vietnam. Limited empirical evidence exists on the determinants of consumer satisfaction within these

formats, particularly for safely certified vegetable products. Previous studies have mainly focused on product or store attributes in isolation, overlooking the combined influence of product attributes, brand characteristics, and the store environment on consumer satisfaction. Furthermore, while the Vietnamese government and retail actors have made substantial efforts to promote the distribution of safely certified vegetables through modern outlets, their market share remains disproportionately low compared with traditional markets. This suggests that consumer satisfaction with safe vegetables in modern retail formats has not been sufficiently understood or effectively enhanced. Addressing this gap is crucial not only for academic purposes, by integrating multiple dimensions influencing satisfaction, but also for practical implications, as improving consumer satisfaction can foster repeat purchases, strengthen brand and store loyalty, and ultimately support the sustainable growth of modern retail systems in emerging markets.

Thus, this study focuses on identifying the factors affecting consumer satisfaction with safely certified vegetables (safe vegetables) in modern retail systems (supermarkets and convenience stores). Specifically, we examine the effects of product attributes, store image, brand familiarity, and brand trust on consumer satisfaction with safe vegetables. This study is expected to provide policy and practical recommendations to help modern retailers design and implement appropriate marketing strategies to strengthen consumer satisfaction more effectively.

2. Theoretical framework and the proposed model

Consumer satisfaction has been extensively discussed within several theoretical frameworks that explain how consumers evaluate products and experiences. The Expectation - Disconfirmation Theory (EDT) is one of the most widely applied, suggesting that satisfaction results from the comparison between consumers' expectations and their actual perceptions of product or service performance [18, 19]. When perceived performance exceeds expectations, satisfaction increases. In the context of safe food, consumers form expectations about quality, safety assurance, freshness, and the credibility of certification; satisfaction emerges when these expectations are met or exceeded through the actual product and purchasing experience.

The Cognitive - Affective Model further explains that satisfaction arises not only from cognitive evaluations (e.g., perceived quality, safety) but also from affective responses such as trust and familiarity [20, 21]. Meanwhile, Store Image Theory posits that consumers' perceptions of a retail store's environment - such as cleanliness, layout, convenience, and reliability - shape their satisfaction and loyalty [22, 23]. For food products that require safety assurance, a positive store image reinforces perceptions of hygiene, authenticity, and trustworthiness.

Drawing on these theoretical foundations, the present study integrates product attributes, store image, brand trust, and brand familiarity to provide a holistic understanding of consumer satisfaction with safely certified vegetables in modern retail outlets. This multidimensional approach captures both cognitive evaluations (product and store factors) and affective components (trust and familiarity), offering a comprehensive framework for examining satisfaction in the context of credence-based food products. Together, these theories provide a cohesive foundation for the proposed framework by demonstrating how cognitive evaluations, affective responses, and store-related cues jointly shape consumer satisfaction with safely certified vegetables.

Product attributes and store image

Product attributes consist of intrinsic (i.e., colour, freshness, texture, form, and taste) and extrinsic (e.g., price, packaging, certification, and brand) components [24, 25]. These attributes influence consumers' purchase decisions and/or consumer satisfaction [24-26]. Thus, based on the Expectation - Disconfirmation Theory, the direct effects of product attributes on satisfaction are developed in the following hypothesis:

H1. Product attributes positively affect satisfaction.

Meanwhile, the indirect effects of product attributes on satisfaction via brand familiarity and brand trust are drawn from the Cognitive - Affective Model. The impact of food product attributes (i.e., product information, quality, packaging, price, certification, etc.) on consumer trust/brand trust has been found in previous studies [27-29]. Such product attributes, which contain product information and brand characteristics (i.e., brand names), also affect consumers'

awareness and familiarity with a brand [27, 29]. These relationships are developed in the following hypotheses:

H2. Product attributes positively influence brand familiarity.

H3. Product attributes positively influence brand trust.

Based on Store Image Theory, store image may have an impact on consumer purchase behaviour and satisfaction [30, 31]. It reflects how a store is defined in consumers' minds by its functional qualities and psychological attributes. We refer to three important dimensions of store image, namely decoration, staff, and advertising [27, 28]. The hypothesis is as follows:

H4. Store image positively affects satisfaction.

The effects of store image on brand trust and/or brand familiarity are also considered [30, 31] based on the Cognitive-Affective Model. Our hypotheses are as follows:

H5. Store image positively influences brand familiarity.

H6. Store image positively influences brand trust.

Brand familiarity and brand trust

Brand familiarity or brand awareness is consumers' recall or recognition of a given brand that he/she knows or has purchased in the past [32]. Meanwhile, brand trust refers to consumers' belief in a given brand's ability to perform its stated function. In this study, consumer trust in a brand of safe food expresses his/her belief that the product safety certified by such a brand is reliable.

The significant roles of brand familiarity and brand trust in consumer satisfaction have been verified in the existing literature [29]. We also hypothesised that better recognition of a brand (brand familiarity) motivates consumer trust in that brand [29].

Based on the Cognitive - Affective Model, our hypotheses are as follows:

H7. Brand familiarity positively affects satisfaction.

H8. Brand familiarity positively affects brand trust.

H9. Brand trust positively influences satisfaction.

Consumer satisfaction

Fulfilling consumer satisfaction with product and service quality plays an essential role in every business. Consumer satisfaction expresses his/her expectation that a given product is

fulfilled after purchasing and consuming the product. It is considered an evaluation of a product against pre-purchase expectations after consumption or use [33].

Consumer satisfaction is a multidimensional construct, which is affected by a range of factors [27]. Based on previous studies, we consider the following factors as the main determinants of consumer satisfaction.

The proposed model is presented in Fig. 1.

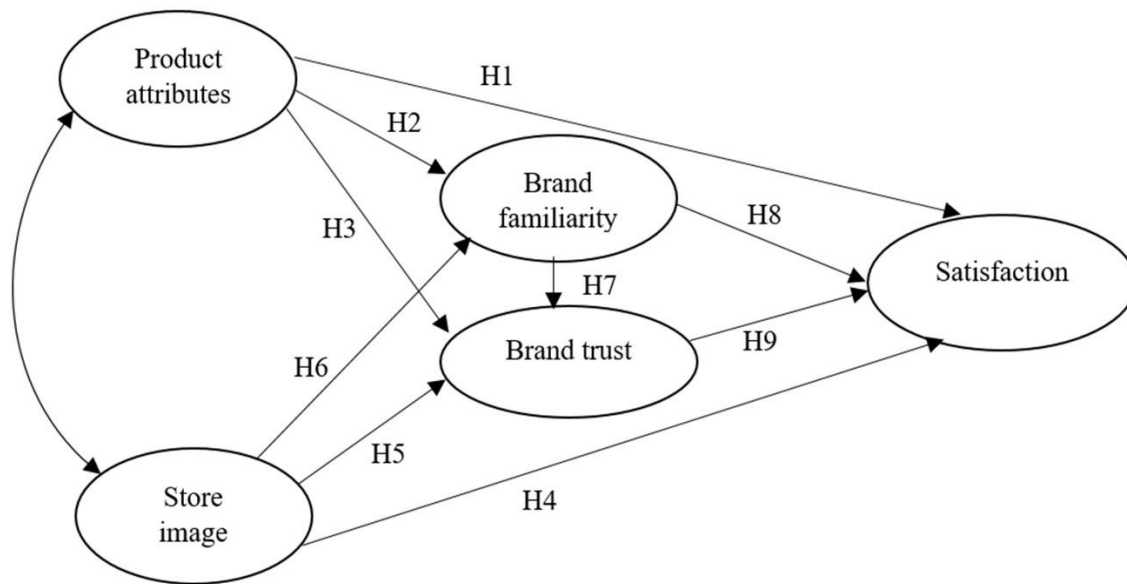


Fig. 1. Factors affecting consumer satisfaction with safe vegetables in modern retail systems.

3. Data collection and analytical methods

3.1. Research area and data collection

This study was conducted in Hanoi, one of the largest cities in Vietnam, with over 8.5 million people in 2023 [34]. Recently, the development of the retailing system in general, and retail outlets for food distribution in particular, has been rapid in Hanoi [13]. This area has also attracted several studies on food safety issues because its citizens show much concern about the safety of food, especially vegetable safety [2, 13]. As discussed in the introduction section, the safe vegetable distribution systems in Hanoi face many challenges, mainly due to low consumer trust [17]. Only around 20% of total safe vegetables are distributed through modern retail outlets, with a price premium compared to conventional vegetables [17].

As the survey targeted consumers who purchase branded safe vegetables, conducting interviews at supermarkets and food stores was appropriate. Consumers who pay attention to food brands typically shop at modern retail outlets, whereas those seeking unbranded vegetables tend to purchase from traditional markets [3, 17]. A convenience sampling approach was therefore adopted, reflecting both practical and contextual considerations. Administering the survey at supermarket and store entrances enabled direct access to actual shoppers with recent and relevant purchasing experiences, ensuring that respondents were familiar with the research topic. To minimise potential selection bias, quota controls were applied for two retail formats (supermarkets and food stores) and key socio-demographic characteristics of shoppers (age and education). Prior to the official survey, a pilot test was conducted with twenty consumers to finalise the questionnaire. A total of 340 consumers were invited to participate in the survey, of whom 298 completed the questionnaire, yielding a response rate of 87.6%. After data cleaning (i.e., removing outliers and incomplete responses), a sample of 250 consumers (125 for each outlet: supermarkets and shops) was used for the final analysis. After finishing the survey, a small gift (equivalent to 30,000 VND or approximately 1.5 USD) was given to each consumer as compensation for his/her participation.

The determination of sample size for multiple regression analysis in general, and Structural Equation Modelling (SEM) in particular, often follows established rules of thumb suggesting between five and ten observations per estimated parameter or item. According to J.F. Hair, et al. (2010) [35], a minimum sample size ranging from 100 to 200 is typically adequate for SEM analyses. In this study, we used 17 items, which required between 85 and 170 observations. Therefore, the final sample of 250 respondents exceeds this threshold and is considered appropriate and sufficient for SEM estimation.

3.2. Measurements

Socio-demographic characteristics of the respondents

A basic description of the respondents' socio-demographic characteristics across retail outlets is reported in Table 1. Overall, the majority of respondents responsible for food shopping were female, which is common in Vietnam [3, 16]. In addition, consumers were

generally young and highly educated, reflecting the fact that they lived in urban areas of the city.

Table 1. Socio-demographic characteristics of the respondents.

Characteristics	Sample	Vietnam's urban population*
Age (years old)	37.8	NA
Gender (%)		
Male	28	49.6
Female	72	50.4
Education (years)	14.9	10.9
Family size (people)	3.7	3.7
Children (%)		NA
Yes	55.6	
No	44.4	
Income (%)		NA
<700 USD	29.6	
700 - 1300 USD	54.8	
>1300 USD	15.6	

*Note: NA: not available. * Calculation from General Statistics Office of Vietnam (GSO, 2020).*

Product attributes, store image, brand familiarity, brand trust, and consumer satisfaction

Regarding product attributes and store image, based on previous work [24, 27, 29], we used six items to measure all important aspects of product attributes and store image related to safe vegetables, namely advertising, appearance, package, price, decoration, and staff. These single-item statements were based on a 5-point Likert scale (from 1 = totally unimportant to 5 = totally important).

Brand familiarity, brand trust, and consumer satisfaction were measured by multi-dimensional constructs using 5-point Likert scales, as recommended by several scholars [19, 25, 26]. In this study, we used four items to measure brand familiarity. These items were adapted from previous studies [36, 37]. Meanwhile, three items were used to assess brand trust, as proposed by two recent studies on trust in food products [3, 38]. The details of observed

items for product attributes, store image, brand familiarity, brand trust, and consumer satisfaction are presented in Table 2.

Table 2. Descriptions of items.

Constructs	Measurement items	Mean	Standard deviations
Product attributes	Fresh appearance of vegetable is important	3.86	0.72
	Nice packages of vegetables are important	3.98	0.68
	Reasonable prices of vegetables are important	4.27	0.70
Store image	Advertising signs are important	3.96	0.73
	Shop decorations are important	3.75	0.60
	Friendly staff are important	3.82	0.74
Brand familiarity	I have much understanding of brands of safe vegetables through visiting and buying (BF1)	4.03	0.76
	The staff provide me a lot of information about the products (BF2)	3.60	0.81
	I can differentiate among brands of safe vegetables in the market (BF3)	3.96	0.72
	I am very sure about the certifications of safe vegetables (BF4)	3.93	0.75
Brand trust	I totally trust the safety of safe vegetable brands (BT1)	4.32	0.62
	I believe that the consumption of safe vegetables with brands is really safe for my family's health (BT2)	4.32	0.69
	I feel totally confident when buying safe vegetables with the brands (BT3)	4.31	0.65
Consumer satisfaction	I am totally satisfied with the safe vegetable brands (CS1)	4.22	0.65

I perceived that the quality and safety of safe vegetable brands are wonderful, as expected (CS2)	4.07	0.67
I feel satisfied after eating safe vegetables (CS3)	4.17	0.67
I feel pleasant when eating safe vegetables (CS4)	4.04	0.72

3.3. Analytical methods

In this study, we used Structural Equation Modelling (SEM) as the main analytical approach. A general SEM consists of two components, namely the measurement model and the structural/path model [31]. Covariance-based Structural Equation Modelling (CB-SEM) was employed in this study due to its suitability for theory testing and confirmation, rather than prediction, as in variance-based SEM [35, 39]. The research aimed to validate the hypothesised relationships among latent constructs influencing Vietnamese consumers' loyalty to safe food, based on the established theoretical framework.

For measurement analysis, the validity and reliability of constructs based on confirmatory factor analysis (CFA) have to meet the following requirements. Factor loadings of all measured items must be at least above 0.4 [39], while composite reliability (CR) and average variance extracted (AVE), used to test the convergent validity of constructs, should exceed 0.5 [35, 39]. Also, discriminant validity, which verifies the differences among latent constructs, requires the square root of AVE to be higher than the inter-construct correlations [35, 39]. For structural analysis, various indices need to be met to ensure the goodness of fit of the model. The comparative fit index (CFI), Tucker-Lewis index (TLI), and goodness-of-fit index (GFI) should be higher than 0.90. In addition, the root mean square error of approximation (RMSEA) should be less than 0.08 as an acceptable threshold, while a threshold of 0.05 is highly recommended [35].

4. Results

4.1. Measurement validity and reliability based on CFA applied to the whole sample

The validity and reliability of the constructs in the measurement model are reported in Table 3. All the criteria for construct validity and reliability were satisfactory. All factor

loadings were higher than 0.4, while the composite reliability values were above 0.8. The average variance extracted also exceeded 0.5. In addition, Table 4 confirmed the differences among latent constructs through higher values of the square root of AVE compared with the correlations among pairs of these constructs. All values of the heterotrait-monotrait ratio (HTMT) in Table 5 were below 0.9, which established the discriminant validity of the latent constructs. Furthermore, no multicollinearity issues were found, as all variance inflation factor (VIF) values were below the threshold of 5 in Table 4.

Table 3. Construct validity and reliability.

Constructs	Items	Standardised loadings	Composite reliability (CR)	Average variance extracted (AVE)
Product attributes (PA)	Appearance	0.857	0.812	0.527
	Package	0.723		
	Price	0.777		
Store image (SI)	Advertising	0.685	0.867	0.689
	Decoration	0.915		
	Staff	0.872		
Brand familiarity (BF*)	BF1	0.771	0.828	0.739
	BF2	0.763		
	BF3	0.672		
	BF4	0.750		
Brand trust (BT*)	BT1	0.864	0.917	0.886
	BT2	0.934		
	BT3	0.860		
Consumer Satisfaction (CS*)	CS1	0.797	0.893	0.822
	CS2	0.832		
	CS3	0.860		
	CS4	0.801		

*Note: *Specific items (BF1, BF2, BF3, BF4, BT1, BT2, BT3, CS2, CS3, CS4) were presented in Table 2.*

Table 4. Discriminant validity based on correlations and AVE.

	1	2	3	4	5	VIF ^a
1. Product attributes	0.726					2.00
2. Store image	0.724*	0.830				1.76
3. Brand familiarity	0.496*	0.598*	0.860			1.53
4. Brand trust	0.581*	0.354*	0.500*	0.941		1.38
5. Consumer satisfaction	0.638*	0.527*	0.547*	0.780*	0.906	

*Note: Bold values are the square roots of the average variance extracted (AVE). *: $p < 0.001$.*

^aVIF values were obtained after running multiple regression with consumer satisfaction as the dependent variable and four independent variables (product attributes, store image, brand familiarity, and brand trust).

Table 5. Discriminant validity based on heterotrait-monotrait ratio (HTMT).

	1	2	3	4	5
1. Product attributes					
2. Store image	0.725				
3. Brand familiarity	0.507	0.522			
4. Brand trust	0.631	0.425	0.499		
5. Consumer satisfaction	0.723	0.587	0.547	0.779	

Because the variables used in our models were derived from self-reported data with various observed variables based on a 5-point Likert scale, it was necessary to assess the potential for common method bias. In this study, we applied Harman's single-factor test to address this issue [40]. The test indicated that the percentage of variance explained by a single factor was 38.4%, which is less than the threshold of 50%. This suggests that common method bias was not a significant issue.

4.2. Structural Equation Modelling (SEM) path (structural) analysis

The relationships among latent constructs in our proposed model were tested through SEM path analysis, as shown in Table 6. Overall, the structural model fitted the data well when all indices to measure the goodness of fit (CFI, GFI, TLI, and RMSEA) were satisfied. The exploratory variables predicted approximately 70% of the variance in consumer satisfaction.

As expected, brand trust was found to be the most important factor directly driving consumer satisfaction ($\beta=0.541$, $p<0.001$). Product attributes also had a positive direct effect on satisfaction. Unexpectedly, however, the direct effects of store image and brand familiarity on consumer satisfaction were not significant at the 10% level. Notably, both product attributes and store image influenced brand-level perceptions (brand familiarity and brand trust). Specifically, product attributes significantly enhanced brand trust, while store image strongly contributed to both brand familiarity and brand trust.

Table 6. Estimations of the whole SEM model.

Paths	Standardised estimates	Bias-corrected bootstrap CI		P-value	Conclusions
		(95%)			
		<i>Lower bound</i>	<i>Upper bound</i>		
Product attributes → Satisfaction	0.254	0.097	0.425	0.006	Support
Store image → Satisfaction	0.083	-0.285	0.338	0.290	No support
Brand familiarity → Satisfaction	0.102	-0.037	0.281	0.137	No support
Brand trust → Satisfaction	0.541	0.329	0.678	0.000	Support
Product attributes → Brand familiarity	0.236	0.161	0.396	0.017	Support
Product attributes → Brand trust	0.688	0.526	0.972	0.000	Support
Store image → Brand familiarity	0.421	0.263	0.729	0.000	Support
Store image → Brand trust	0.350	0.264	0.561	0.000	Support
Brand familiarity → Brand trust	0.338	0.229	0.536	0.000	Support

Indices of the model	
fit	
CFI	0.965
GFI	0.914
TLI	0.956
RMSEA	0.056
Prediction of the variance in satisfaction:	R-square=69.5%

Note: CFI (Comparative fit index), GFI (Goodness of fit index), TLI (Tucker-Lewis index), RMSEA (Root mean square error of approximation).

Table 7 presents the mediating role of brand trust in the relationships between store image and consumer satisfaction, and between brand familiarity and consumer satisfaction, using the bootstrapping technique with 5,000 replications. The results indicate that the direct effects of both store image and brand familiarity on consumer satisfaction were statistically insignificant. However, the indirect effects of both variables through brand trust were positive and significant, with $\beta=0.126$ and $\beta=0.209$ for store image and brand familiarity respectively, at the 1% level.

Table 7. Mediating role of brand trust using bootstrapping techniques (5,000 replications).

			Bias-corrected CI (95%)	
	Standardised estimates	P-value	Lower bound	Upper bound
Store image → satisfaction				
Direct effect: product attributes → satisfaction	0.076	0.436	-0.129	0.141
Indirect effect (through brand trust)	0.126	0.000	0.086	0.242
Familiarity → satisfaction				
Direct effect: Familiarity → satisfaction	0.117	0.327	-0.034	0.260
Indirect effect (through brand trust)	0.209	0.001	0.116	0.309

*Note: NS (not significant at 10%), *** Significant at 1%*

5. Discussion and implications

5.1. Discussion

There has been little evidence of how consumers are satisfied with safe vegetables in modern retailers (i.e., supermarkets and safe food shops) in developing countries such as Vietnam. This study contributes to the existing literature on the determinants of consumer satisfaction with safe vegetables across retail formats in Vietnam by integrating product attributes, store image, brand trust, and brand familiarity.

In this study, we found the important role of brand trust in increasing consumer satisfaction. Brand trust had the strongest direct effect on satisfaction, which is similar to Drennan [9, 41]. These authors revealed that consumer satisfaction was mostly affected by brand trust, followed by experience. Similarly, M.U.H. Uzir, et al. (2025) [42] confirmed the positive relationship between brand trust and consumer satisfaction. In the Vietnamese context, cultural values such as collectivism, high uncertainty avoidance, and relational trust may further shape the role of brand trust in food-related satisfaction. Consumers often rely on interpersonal networks, word-of-mouth, and shared community experiences when evaluating the safety and reliability of food products, which can amplify the importance of trusted brands as risk-reducing signals.

We confirmed the direct effect of product attributes (including price, appearance, and packaging) on satisfaction, as found in previous work [5, 43]. In a previous study, S. Dang, et al. (2019) [44] revealed that Vietnamese people prefer fresh vegetables. M. Malekpour, et al. (2021) [25] also indicated the importance of product attributes in improving customer satisfaction.

In this study, we did not find a direct effect of store image (store decoration, staff, and advertising) on satisfaction. This finding differs from other work reporting a significant role of store image in consumer satisfaction [45]. This may be explained by the fact that safe vegetable supermarkets/shops have not yet fully satisfied Vietnamese consumers. Despite the absence of a direct effect, store image had an indirect effect on satisfaction through brand trust. This is in line with the work of F.A. Konuk (2018) [27], who reported a significant effect of store image on trust in organic food, thereby motivating consumers' intention to purchase food. The effect

of store image on consumer trust/brand trust leading to higher intention to buy is also consistent with a prior study [27]. This suggests that an attractive store image helps to increase consumer trust in brands, which in turn improves satisfaction.

Brand trust also acted as a mediator between brand familiarity and satisfaction. Brand familiarity increased brand trust, which improved brand loyalty, as found by M.U.H. Uzir, et al. (2025) [42]. This is similar to previous work, which suggested that building brand trust has become essential when food safety is of great concern [3, 38]. However, in contrast with these authors' findings [32], we did not find a direct influence of brand familiarity on satisfaction. Thus, our results reveal that increasing consumer awareness of brands (brand familiarity) motivates brand trust and then leads to higher satisfaction.

Furthermore, brand familiarity was strengthened by consumer perception and evaluation of product attributes and brand characteristics, as found by prior scholars [46]. This reveals that product attributes (i.e., packaging, labels, or brand names) designed to create unique signals can help consumers more easily recall, become familiar with, and differentiate brands from competing products. Similarly, the distinctiveness of store image facilitates the recognition of brands, as suggested by previous studies [24, 36]. As a result, greater brand familiarity strengthens consumer trust in the brand, thereby contributing to higher overall satisfaction levels.

It is also noted that the findings of this study may differ across emerging markets depending on institutional quality, food safety regulations, and consumer confidence in modern retail systems. In contexts with stronger regulatory enforcement, store image may exert a more direct influence on satisfaction, whereas in markets with weaker governance, brand trust may play a more central role as a substitute for formal quality assurance. Additionally, the relative importance of product attributes and branding cues may vary across retail formats, with tangible cues dominating in traditional markets and trust-based factors becoming more salient in organised retail settings.

5.2. Theoretical implications

This study contributes to the literature on consumer satisfaction and food retailing by refining theoretical perspectives on satisfaction formation in high-risk consumption contexts.

Rather than reiterating specific empirical relationships, the findings collectively emphasise the centrality of trust-based mechanisms in explaining satisfaction with credence goods such as safe vegetables. This advances satisfaction theory by highlighting that cognitive evaluations of safety and reliability may outweigh traditional evaluative cues in markets where product quality is difficult to verify *ex ante*.

Moreover, the study offers an integrative conceptualisation that bridges tangible retail cues (e.g., product- and store-related signals) and intangible brand-related constructs within a single framework. By positioning brand trust as a key transmission mechanism, the research extends prior models that often treated these constructs in isolation. This integrated approach provides a more holistic explanation of how consumers process multiple sources of information when forming satisfaction judgements in safe-food markets.

The results also contribute to retailing theory by suggesting a conditional role of store image. Rather than functioning as a universal antecedent of satisfaction, store image appears to operate through more abstract psychological pathways. This insight calls for a reconsideration of linear assumptions commonly embedded in store image-outcome models and supports more process-oriented explanations of consumer responses in emerging markets.

Finally, the study refines brand familiarity theory by demonstrating that familiarity alone does not necessarily generate favourable consumer outcomes in contexts characterised by perceived risk. Instead, familiarity must be accompanied by trust to be theoretically meaningful for satisfaction formation. This distinction enhances the explanatory precision of familiarity-based frameworks and suggests boundary conditions under which familiarity effects are likely to emerge.

Overall, the integrated framework advances beyond prior single-theory approaches by moving away from isolated explanations of satisfaction and instead modelling how tangible retail cues and intangible brand-related factors interact through trust-based mechanisms, thereby offering a more process-oriented and context-sensitive account of satisfaction formation in high-risk food consumption settings.

5.3. Practical implications

From a managerial perspective, these findings offer several actionable insights for vegetable retailers and policymakers. First, since brand trust is the strongest driver of satisfaction, retailers should prioritise building and maintaining trust through transparent sourcing, reliable safety certifications, and consistent product quality. For instance, retailers should implement a standardised in-store traceability system (e.g., QR codes on packaging linking to information on farm origin, safety certification, and inspection dates) and actively train staff to explain this information to consumers, thereby translating transparency initiatives into tangible trust-building interactions at the point of purchase. Publicising credible vegetable safety labels and ensuring traceability can reinforce consumers' confidence in brand reliability.

Second, store image should be leveraged as a trust-building mechanism rather than as a direct satisfaction driver. Modern retailers in Vietnam can cultivate trustworthy images through professional staff training, hygienic store environments, and clear communication of food safety practices. Visual cues such as cleanliness, organisation, and informative signage can signal credibility and reinforce brand trust.

Third, enhancing brand familiarity - through consistent branding, recognisable packaging, and community engagement - can strengthen consumers' attachment to safe vegetable brands. However, familiarity must be coupled with trustworthiness to translate into satisfaction. Retailers should thus combine marketing communications with evidence of integrity and product authenticity.

Finally, policymakers and retail associations can support the development of trust-based marketing frameworks by establishing clear certification standards and promoting consumer education about safe vegetable systems. Specifically, policymakers should develop and enforce a unified national certification and labelling framework for safe vegetables, accompanied by public awareness campaigns that educate consumers on how to recognise and interpret certified safety labels, thereby reducing information asymmetry and strengthening trust in regulated retail channels. These institutional efforts will not only increase consumer satisfaction but also foster long-term loyalty and reduce scepticism towards domestic vegetable brands.

5.4. Limitations

The main limitations of this study have been addressed. First, the use of a convenience sampling technique limits the generalisability of the findings. The sample was drawn from consumers shopping at selected supermarkets and safe food stores in Hanoi, which may not fully represent the broader population of Vietnamese consumers (i.e., the sample included a much higher proportion of female respondents) or those purchasing through other retail formats such as traditional markets and online platforms. For instance, the predominance of female participants in the sample may limit the extent to which the findings reflect men's food purchasing behaviour. Future studies should consider probability-based or stratified sampling methods to enhance representativeness and external validity.

Second, some constructs in the model, particularly product attributes and store image, were measured using selected aspects with single-item indicators, which may constrain the reliability and depth of construct measurement. Future research should employ multi-item scales validated in prior studies to capture the complexity of consumer perceptions more effectively.

Third, although the study examined key determinants of consumer satisfaction, including product attributes, store image, brand familiarity, and brand trust, other potential factors such as perceived value, food safety knowledge, risk perception, and cultural or social influences were not included. Incorporating these variables could provide a more comprehensive understanding of satisfaction formation in the context of safe food consumption.

Finally, the findings are specific to safe vegetable products and may not be directly transferable to other food categories such as meat or dairy, where perceptions of risk, spoilage, and safety assurance mechanisms differ. Future studies should therefore extend the model to other food categories and conduct comparative analyses across product types to examine whether the relative importance of brand trust, product attributes, and store image varies with category-specific risk and handling requirements.

Despite these limitations, this work contributes to exploring the determinants of consumer satisfaction with safe food in modern retail systems in a developing country such as

Vietnam. It can serve as a useful reference for food marketers in other countries in designing effective strategies to improve consumer satisfaction with safe food in modern outlets.

6. Conclusions

This study underscores the pivotal role of brand trust in enhancing consumer satisfaction with safe vegetables in modern retail systems in developing contexts such as Vietnam. Brand trust not only exerted the strongest direct influence on satisfaction but also mediated the effects of store image and brand familiarity. Additionally, product attributes, including appearance, price, and packaging, significantly contributed to consumer satisfaction. Although brand familiarity did not directly affect satisfaction, it enhanced satisfaction indirectly through brand trust.

From a managerial perspective, strengthening brand trust should be a core strategy for safe vegetable marketers. Efforts should focus on improving brand credibility through transparent product information, reinforcing brand reputation via communication and word-of-mouth, and ensuring supply chain reliability. Enhancing product and store attributes, together with expanding brand visibility through marketing campaigns and community engagement, can further increase brand familiarity, trust, and ultimately, consumer satisfaction.

Future research should employ more representative sampling strategies across diverse retail formats and geographical regions to improve the generalisability of findings. Additionally, extending the conceptual model by using multi-item measures and incorporating broader psychological, social, and cultural factors, such as risk perception and food safety knowledge, would offer a more comprehensive understanding of consumer satisfaction with safe food products.

CRedit author statement

Minh Hai Ngo: Conceptualisation, Methodology, Formal analysis, Investigation, Writing - Original draft, Writing - Reviewing and Editing, Validation, Supervision.

COMPETING INTERESTS

The author declares that there is no conflict of interest regarding the publication of this article.

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