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Vegetarian and Vegan Food Provision in Busan: Availability, Nutrition, and Satisfaction among International Students

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Abstract

This study examines vegetarian and vegan food provision in Busan, South Korea, focusing on availability, nutritional adequacy, food quality, and satisfaction among international students. As Korean cuisine remains largely meat-based, international students following plant-based diets often struggle to find suitable, nutritious, and culturally appropriate meals. Data were collected from 41 international students through a structured questionnaire adapted from established foodservice satisfaction scales. Partial Least Squares Structural Equation Modelling (PLS-SEM) was used to test relationships among key factors, including service availability, nutrition adequacy, food hygiene, price, vegetarian/vegan menu options, food quality, and satisfaction. Results show that food hygiene ($\beta = 0.673, p < .001$) and price ($\beta = 0.284, p < .05$) significantly influenced food quality, while service availability and nutrition adequacy had no significant effects. Vegetarian and vegan menu options positively affected both food quality and satisfaction, though the direct relationship between food quality and satisfaction was not statistically significant. These findings suggest that while providing vegetarian and vegan options enhances inclusivity, limited variety, taste, and cultural relevance may hinder overall satisfaction. The study extends foodservice quality theory by incorporating cultural and dietary inclusivity within institutional dining contexts. Practically, it highlights the need for universities and commercial food providers to improve menu diversity, hygiene standards, and culturally tailored plant-based offerings. Strengthening these aspects can enhance satisfaction, support student well-being, and align with South Korea's growing commitment to sustainable food practices.

Keywords: Vegan-Vegetarian; Availability; Nutrition; Satisfaction; Food quality; International students

1. Introduction

The global shift toward vegetarian and vegan diets has been driven by a growing awareness of health benefits, ethical considerations, and environmental sustainability (Craig & Mangels, 2009; Neacșu & Tache, 2021). While South Korean cuisine is traditionally centred on meat and seafood, plant-based eating is gradually gaining traction, particularly in urban areas like Busan, where dietary trends are influenced by globalisation and changing consumer preferences (Switzerland Global Enterprise, 2024). This dietary transition is occurring alongside a significant increase in the number of international students in South Korea, many of whom adhere to vegetarian or vegan diets due to cultural, religious, or personal reasons (Lee & Kim, 2019; Hong et al., 2018). These limitations often result in reduced meal satisfaction, potential health risks, and barriers to successful academic and social integration (Seo, et al., 2021; Chae & Ha, 2020).

Although existing research has highlighted the importance of foodservice factors such as hygiene, price, availability, and menu variety in shaping overall food quality perceptions (Namkung & Jang, 2007; Han & Ryu, 2009), few studies have explored how these variables specifically affect plant-based dietary experiences among international students in South Korea. To address this gap, the present study investigates the role of key foodservice attributes in influencing perceptions of food quality and satisfaction among international students in Busan. The findings aim to inform the development of more inclusive, culturally responsive, and health-focused foodservice practices within higher education institutions. This study examines vegetarian and vegan food provision in Busan universities and commercial food sectors, assessing availability, nutritional adequacy, and international student satisfaction. It aims to inform more inclusive and health-oriented food policies in academic institutions examine the availability, nutritional adequacy, food hygiene, pricing, and vegetarian/vegan menu options provided to international students in Busan. It assesses how these foodservice attributes influence perceived food quality, evaluates the direct and indirect effects of food quality on overall satisfaction, and identifies key areas for improvement in institutional and commercial foodservice.

operations to better support the dietary needs, cultural preferences, and well-being of international students.

2. Literature Review

2.1. *Service Availability and Its Impact on Food Quality*

Service availability is a significant factor influencing how consumers perceive food quality in both institutional settings, such as campus dining, and in commercial foodservice establishments, including restaurants, cafés, and convenience stores. For international students, who often face financial constraints, busy academic schedules, and unfamiliar culinary environments, dependable access to suitable meals is essential. Although many rely on university dining halls, others turn to nearby commercial food providers to meet their dietary needs. In both settings, the consistency and accessibility of service play a central role in shaping their evaluation of food quality. Kim et al., (2018) found that when foodservice operations do not offer reliable or timely service, consumers tend to assess the quality of food negatively, even if the meals themselves are nutritionally sound and taste acceptable.

This issue is particularly evident among students with specific dietary requirements, including those based on religious, ethical, or personal health reasons. As noted by Chae and Ha (2020), limited menu diversity and rigid meal schedules often fail to accommodate these students, leading to increased dissatisfaction. Jang et al., (2015) also emphasised that delays in service, restricted operating hours, and a lack of flexibility often contribute to negative perceptions of food quality. In South Korea, many international students report logistical difficulties in both university and commercial foodservice environments.

These include extended waiting times during peak hours, the absence of food options during off-peak periods, and inconsistent availability of meals that align with vegetarian or culturally familiar diets (Seo et al., 2021). According to Lee and Kim (2017), such limitations discourage regular use of foodservice facilities and contribute to an overall decline in satisfaction. Park and Yoo (2019) further argued that service availability is not

merely a matter of convenience but a fundamental component of how food quality is perceived. This perspective is consistent with the SERVQUAL model introduced by Parasuraman et al., (1988), which highlights responsiveness and assurance as essential dimensions of service quality. When foodservice providers, whether institutional or commercial, consistently meet student dietary needs in a timely and convenient manner, the perceived quality of their offerings improves significantly. Therefore, service availability should be considered a key predictor of food quality perceptions among international students. Based on the previous findings, the following hypothesis is suggested:

H1: Service availability has a positive relationship with Food Quality

2.2 Nutritional Adequacy as a Pillar of Perceived Food Quality

Nutritional adequacy is a key factor in evaluating food quality, particularly in university and commercial foodservice settings where many students, especially international ones, depend on daily meals. It refers to how well a meal meets dietary guidelines and provides the essential nutrients needed to support health and prevent disease (Neumark-Sztainer & French, 2002). For students balancing academics and limited food options, the nutritional value of available meals strongly influences their satisfaction with foodservice overall (Papadaki & Scott, 2002). Many international students face dietary challenges when meals offered are either unfamiliar or nutritionally imbalanced. Alakaam et al., (2015) reported that international students in the U.S. often struggled to maintain healthy eating patterns due to limited nutritious choices and a lack of culturally appropriate foods.

These concerns are echoed in South Korea, where foreign students also report difficulties accessing balanced, familiar meals in both university cafeterias and local restaurants. Student food choices are increasingly influenced by health considerations. Glanz et al., (1998) found that nutritional value often outweighed cost or convenience among college students concerned about long-term health. Deliens et al., (2014) highlighted this growing trend toward health-conscious eating, showing that students actively seek healthier options in both campus and off-campus dining environments. Perceived gaps in nutritional quality, such as insufficient fibre, protein, or essential vitamins, can negatively

affect how students assess food quality, even if meals are tasty or visually appealing (Larson et al., 2007). Bleich et al., (2015) found that food services offering more health-focused meals tend to receive higher satisfaction ratings. This is particularly important for vegetarians and vegans, whose needs for nutrients like iron, calcium, and B12 are often unmet by standard menus. Lea et al., (2006) noted, these consumers tend to judge food quality based on how nutritionally complete their meals are, which underscores the importance of inclusive, varied menu planning. Supporting this view, the World Health Organisation WHO, (2015) has called for nutrition standards in meal planning, citing the positive effects of balanced diets on academic performance and overall health. In sum, offering nutritionally balanced and culturally diverse meals is essential not only for meeting students health needs but also for improving their perception of food quality and encouraging continued use of available food services. Hence, this study proposed the following hypothesis:

H2: Nutritional adequacy has a positive relationship with perceived food quality.

2.3 Food Hygiene and Its Role in Food Quality Perception

Food hygiene is widely acknowledged as a core determinant of how food quality is perceived, particularly within institutional and commercial foodservice environments. It encompasses a range of practices related to cleanliness, sanitation, and food safety that are integral not only to consumer health but also to their overall dining experience (WHO, 2020). In settings that serve diverse student populations, such as university dining halls and nearby eateries frequented by international students, hygiene is often seen as a direct indicator of food quality regardless of a meal's nutritional content or taste. Clayton et al., (2002) highlight the importance of hygienic practices such as proper storage, food handler hygiene, and sanitary preparation spaces in shaping consumer expectations. Choe et al., (2012) reported that university students expressed lower satisfaction with foodservice operations when hygiene concerns, such as cross-contamination or improper temperature control, were observed, even when the meals were otherwise acceptable.

This focus on hygiene aligns with broader service quality frameworks. Seo et al., (2019) emphasise that students are more likely to return to and recommend dining venues that

maintain visible cleanliness in both kitchen and service areas. This view is supported by findings from the Korea Food Research Institute (2017), where over three-quarters of surveyed students rated hygiene as the most crucial factor in evaluating food quality in institutional settings. Given the previous findings, the following hypothesis is proposed:

H3: Food Hygiene has a positive relationship with perceived food quality.

2.4 Price Sensitivity and Food Quality

Price is a major influence on food quality perceptions, especially for budget-conscious international students. Consumers often use price as a proxy for value and freshness (Zeithaml, 1988). Extremely low prices can raise concerns about safety or nutrition, while mid-range prices are seen as offering fair value (Lichtenstein et al., 1993; Binkley, 2006). In South Korea, students often assess cafeteria and restaurant meals based on perceived price fairness. Higher prices for vegetarian or cultural meals can be seen as exclusionary (Lee, 2021). The price quality heuristic suggests students interpret higher prices as indicative of quality, especially in the absence of product information (Rao & Monroe, 1989; Grunert, 2005). Premium features like organic ingredients enhance value perception (Hartmann et al., 2013), and fair pricing improves satisfaction and trust (Jang & Lee, 2019).

H4: Price has a positive relationship with Food Quality.

2.5. Vegetarian and Vegan Menu Options in Enhancing Perceived Food Quality and Satisfaction

The inclusion of vegetarian and vegan options in both institutional and commercial foodservice settings is increasingly viewed as a critical factor influencing consumers' perceptions of food quality and overall satisfaction. This trend is particularly relevant for multicultural populations, such as international students, who may require or prefer plant-based diets due to religious, ethical, health, or environmental considerations. Vegetarian and vegan options are often associated with higher perceptions of food quality due to their alignment with health and sustainability values. Research by Garnett et al., (2021) in a French university cafeteria found that increasing the availability of vegetarian meals from

24% to 48% resulted in a significant rise in vegetarian meal choices from 23% to 45%. Notably, this increase did not negatively affect meal satisfaction or acceptance, indicating that offering more vegan options can improve food quality perception without compromising satisfaction. In another study conducted in healthcare settings, Eustachio Colombo et al., (2022) explored the effects of menu design strategies such as increasing the availability of vegetarian options and incorporating health prompts. Although combining high availability with health-focused messages slightly reduced satisfaction levels, the increase in vegetarian meal selection underscored the positive effect of such strategies on food choice behaviour. These findings reinforce the idea that plant-based meals are increasingly recognised as quality choices when they are well-integrated and visually appealing.

Customer satisfaction is also directly influenced by the presence of vegan options. According to Namkung and Jang (2007), customer satisfaction is a major determinant of return intentions and willingness to pay a premium. A study by Suhartanto et al., (2020) confirmed that vegetarian menu availability significantly affected satisfaction, which in turn mediated its effect on loyalty and willingness to pay. From the perspective of barriers and facilitators, research by Graça et al., (2015) identified factors that influence consumers' willingness to adopt vegetarian options. While lack of availability, concerns over taste, and inadequate portion sizes were cited as common barriers, perceived health and environmental benefits acted as key facilitators. These insights suggest that the quality perception of vegan options can be improved through thoughtful menu curation that emphasises flavour, variety, and satiation. In university settings, Lea et al., (2006) found that students choosing vegetarian options reported higher levels of dietary satisfaction when menus were perceived as healthy, ethical, and environmentally responsible. The absence of such options, on the other hand, often led to feelings of exclusion or compromised nutritional intake among students with dietary restrictions. In summary, the integration of vegetarian and vegan meals into institutional and commercial foodservice menus enhances both perceived food quality and customer satisfaction. By addressing identified barriers and leveraging facilitators such as promoting taste, nutrition, and sustainability, foodservice providers can not only improve the dining

experience but also meet the evolving dietary demands of a diverse consumer base. Therefore, the following hypotheses are suggested to investigate the relationship between vegetarian and vegan menu options, food quality and *satisfaction*.

H5: Vegetarian/ Vegan menu options have a positive relationship with Food Quality

H6: Vegetarian/ Vegan menu options have a positive relationship with Satisfaction

2.6. Food quality and Satisfaction

Food quality is widely acknowledged as a core determinant of customer satisfaction in both institutional and commercial foodservice settings, particularly those serving heterogeneous populations such as international students. As a multidimensional construct encompassing attributes such as taste, freshness, temperature, appearance, nutritional balance, and hygiene, food quality significantly shapes diners' evaluations and experiences Johns & Pine (2002).

Perceptions of food quality are integral to the overall dining experience and are closely linked to satisfaction and behavioural outcomes. Namkung and Jang (2007) emphasised that food quality serves as one of the most robust predictors of customer satisfaction and loyalty in the restaurant sector. Their empirical findings identified specific dimensions, namely presentation, taste, and freshness, as critical in driving favourable customer responses. When these elements meet or exceed diners' expectations, satisfaction rises markedly, leading to repeat patronage and positive word-of-mouth communication. Han and Ryu (2009) provided further support through a structural model that traced the relationship between food quality, satisfaction, and loyalty in casual dining environments. Their results demonstrated a direct, statistically significant effect of food quality on satisfaction, which subsequently mediated its influence on loyalty. These findings suggest that quality assessments are not only immediate reflections of the dining experience but also predictors of future consumer behaviour and long-term engagement. The sensory dimensions of food also warrant particular attention. Liu and Jang (2009) underscored the importance of attributes such as aroma, texture, and visual appeal, arguing that these sensory experiences have a greater influence on satisfaction than environmental or service-related factors. This insight is especially relevant in institutional settings where

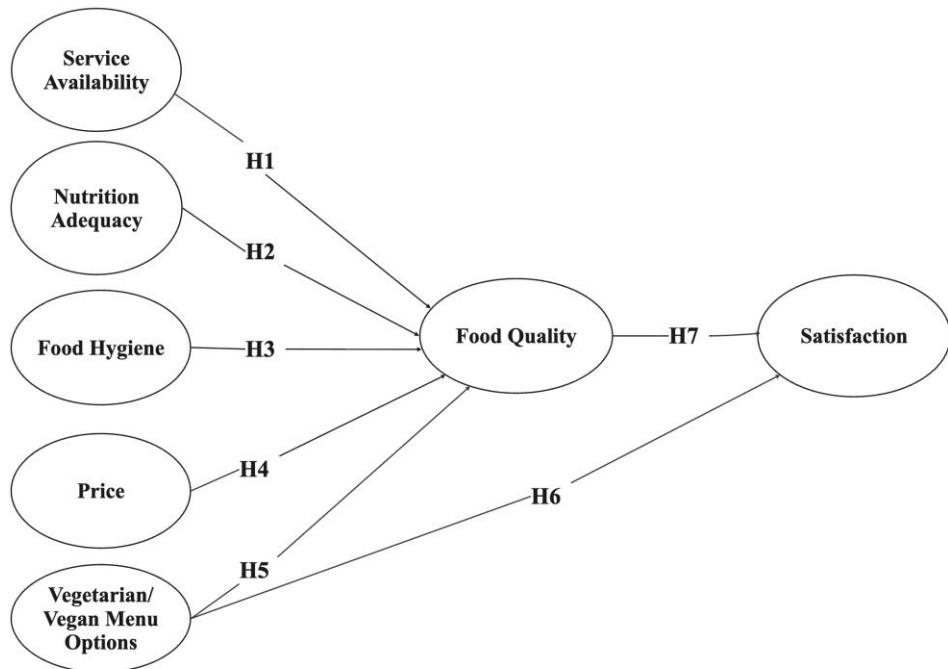
operational constraints may limit service enhancements, thereby positioning food quality as the most effective lever for improving the consumer experience. Their findings indicated that even when service or ambience did not meet expectations, high food quality could mitigate dissatisfaction and preserve a positive overall assessment. This targeted sampling approach allows for more refined statistical analyses, ensuring that the effects of food hygiene on perceived food quality are captured more accurately across diverse student populations. Shuting, T et al., (2018). In sum, food quality functions as a cornerstone of customer satisfaction in both institutional and commercial foodservice contexts. For international students and other diverse consumer groups, consistently high standards in taste, hygiene, nutritional adequacy, and presentation are essential in fostering a satisfactory and inclusive dining environment. Institutions that prioritise food quality are better positioned to enhance the overall student experience and sustain consumer engagement over time. Therefore, this study proposed the following hypothesis:

H7: Food Quality Has a Positive Relationship with Satisfaction

3. Methodology

3.1. Research Model

Based on prior research and the proposed hypotheses, the research model depicted in Figure 1 is designed to examine how various foodservice factors, including service availability, nutrition adequacy, food hygiene, price, and vegetarian/vegan menu options, impact international students overall satisfaction. Food quality is proposed as a central mediating variable through which service availability (H1), nutrition adequacy (H2), food hygiene (H3), price (H4), and vegetarian/vegan menu options (H5) influence satisfaction. Additionally, vegetarian/vegan menu options are hypothesised to have a direct effect on satisfaction (H6), while food quality itself is proposed to directly influence satisfaction (H7).



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Figure 1. Research Model

3.2. Survey Instrument

The measurement scale was adapted from validated instruments in prior studies on vegetarian/vegan food provision and student foodservice satisfaction, including Akbara et al., Choi et al. (2021), Peruvemba et al., (2024) and Jeong et al., (2013). Minor contextual adjustments were made to reflect the experiences of international students in Busan. All items were rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). Service Availability (Akbara et al.,) assessed access consistency, scheduling alignment, and provision across institutional and commercial settings. Nutrition Adequacy (Akbara et al.; Peruvemba et al.,) measured nutrient sufficiency, energy value, and access to dietary information. Food Hygiene (Jeong et al.; Choi et al.) evaluated cleanliness, food preparation, and staff hygiene. Price (Choi et al.,) covered affordability, value, and price fairness. Menu Options (Choi et al., 2021) examined dish variety, cultural relevance, and menu updates. Food Quality (Choi et al., 2021) included freshness, taste, appearance,

vendor reliability, and consistency. Satisfaction (Akbara et al.,) captured overall dining satisfaction and its role in students adjustment to life in Busan.

3.3 Sampling and data collection

This analysis is based on responses from 41 international students at Busan, who identified as either vegetarian, vegan, or flexitarian. The majority were aged 18–29 years (87.8%) and female (68.3%). Participants were primarily enrolled in Global Hospitality and Tourism, Global Studies, and Language Courses. Most respondents were Nepali (41.5%), followed by Indian (24.4%), with others from Bangladesh, Sri Lanka, Indonesia, and various countries. Regarding their stay in Busan, 29.3% had lived there for 1–2 years, and 26.8% for more than two years. Hinduism was the most common religion (51.1%), followed by Christianity, Islam, and Buddhism. Nearly half (48.9%) reported monthly living expenses between 500,000 and 1,000,000 KRW. In terms of dietary identity, 75.6% were flexitarian, 19.5% vegetarian, and 4.9% vegan. Dining out 1–3 times per month was most frequent (40.4%)

Table1. Socio-Demographic Information (n=41)

	Demographic	Frequency	Percent
<i>Age</i>	18-29 years	36	87.8
	30-39 years	05	12.2
<i>Gender</i>	Male	13	31.7
	Female	28	68.3
<i>Nationality</i>	Nepali	17	41.5
	Bangladeshi	3	7.3
	Indonesian	1	2.4
	Srilankan	3	7.3
	Indian	10	24.4
	Other	7	17.1
<i>The duration of stay in Busan as an international Student</i>	Less than 6 months	9	22.0
	6–12 months	9	22.0
	1–2 years	12	29.3
	More than 2 years	11	26.8
<i>Religion</i>	Christianity	6	12.8
	Islam	4	8.5
	Buddhism	4	8.5
	Hindu	24	51.1
	Other	3	6.4

<i>Monthly Living Cost</i>	Less than 500,000 KRW	12	25.5
	500,000-10,00,000 KRW	23	48.9
	11,00,000-20,00,000 KRW	6	12.8
<i>Dietary Preference</i>	Vegan (No animal Products))	2	4.9
	Vegetarian (No meat or fish but may include dairy/eggs)	8	19.5
	Flexitarian (Mostly plant based but occasionally eats meat)	31	75.6
<i>Dine out frequency</i>	1-3 times per month	19	40.4
	4-6 times per month	12	29.3
	More than 7 times per month	10	24.4

3.4 Data Analysis

The partial least squares structural equation modelling (PLS-SEM) approach was employed to perform the analyses using Smart PLS software version 4. PLS-SEM is a widely recognised analytical technique. PLS-SEM is especially useful when dealing with complex models, small sample sizes, and non-normal data distributions. It enables combining the investigation of both measurement and structural models, offering a reliable method for validating latent factors and evaluating path relationships (Hair et al., 2019).

4. Results

4.1 Measurement Model Testing

This table shows the factor loadings, Cronbach's alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) for the constructs used in the study. These results validate the reliability and construct validity of the measurement items across seven key factors: Service Availability (SA), Nutrition Adequacy (NA), Food Hygiene (FH), Price (P), Vegetarian/Vegan Menu Options (VVMO), Food Quality (FQ), and Satisfaction (S). Service Availability (SA) demonstrated acceptable reliability, with factor loadings ranging from 0.514 to 0.838. Cronbach's alpha of 0.785 indicated moderate internal consistency, while the CR of 0.850 supported construct reliability. The AVE of 0.538 confirmed adequate convergent validity. Nutrition Adequacy (NA) showed high reliability and validity, with factor loadings between 0.772 and 0.884, Cronbach's alpha of 0.905, CR of

0.927, and AVE of 0.717. Food Hygiene (FH) exhibited excellent measurement properties, with loadings from 0.863 to 0.947, Cronbach's alpha of 0.948, CR of 0.960, and AVE of 0.828. Price (P) also demonstrated very high reliability and validity, with factor loadings from 0.881 to 0.952, Cronbach's alpha of 0.956, CR of 0.966, and AVE of 0.851. Vegetarian/Vegan Menu Options (VVMO) achieved good psychometric adequacy, with factor loadings ranging from 0.755 to 0.842, Cronbach's alpha of 0.860, CR of 0.896, and AVE of 0.632. Food Quality (FQ) showed excellent reliability and convergent validity, with loadings from 0.850 to 0.940, Cronbach's alpha of 0.944, CR of 0.957, and AVE of 0.818. Satisfaction (S) also reflected high reliability and validity, with factor loadings between 0.811 and 0.940, Cronbach's alpha of 0.916, CR of 0.937, and AVE of 0.749.

Table 2. Reliability and Validity Results

Constructs		Standardized Loadings	Cronbach's Alpha	CR	AVE
Service Availability	SA1	0.514	0.785	0.850	0.538
	SA2	0.738			
	SA3	0.753			
	SA4	0.838			
	SA5	0.781			
Nutrition Adequacy	NA1	0.852	0.905	0.927	0.717
	NA2	0.859			
	NA3	0.884			
	NA4	0.861			
	NA5	0.772			
Food Hygiene	FH1	0.876	0.948	0.960	0.828
	FH2	0.947			
	FH3	0.863			
	FH4	0.935			
	FH5	0.927			
Price	P1	0.881	0.956	0.966	0.851
	P2	0.915			
	P3	0.944			
	P4	0.952			
	P5	0.918			
Vegetarian/Vegan Menu Options	VVMO1	0.790	0.860	0.896	0.632
	VVMO2	0.759			
	VVMO3	0.827			
	VVMO4	0.755			
	VVMO5	0.842			
	FQ1	0.886	0.944	0.957	0.818
	FQ2	0.910			

Food Quality	FQ3	0.932			
	FQ4	0.850			
	FQ5	0.940			
Satisfaction	S1	0.867			
	S2	0.856			
	S3	0.885	0.916	0.937	0.749
	S4	0.940			
	S5	0.811			

Notes. SA: Service Availability, NA: Nutrition Adequacy, FH: Food Hygiene, P: Price, VVMO: Vegetarian and Vegan Menu option, FQ: Food Quality, S: Satisfaction, AVE: Average Variance Extracted

If a factor's discriminant validity is considered significant, the square root of the average variance extracted for each latent variable must be higher than the other correlation coefficients. The study's findings indicate that the requirements for discriminant validity are Table 3 presents the results of our model's validity and reliability.

Table 3. Discriminant Validity (Fornell-Larcker Criterion)

	FH	FQ	NA	P	S	SA	VVMO
FH	0.910						
FQ	0.845	0.904					
NA	0.460	0.429	0.847				
P	0.631	0.703	0.553	0.922			
S	0.536	0.708	0.698	0.693	0.865		
SA	0.508	0.533	0.659	0.655	0.779	0.733	
VVMO	0.452	0.445	0.580	0.532	0.673	0.703	0.795

Notes. SA: Service Availability, NA: Nutrition Adequacy, FH: Food Hygiene, P: Price, VVMO: Vegetarian and Vegan Menu option, FQ: Food Quality, S: Satisfaction,

4.2. Hypotheses Test Results

The table shows the results of the path analysis that Service Availability (SA) ($\beta = 0.058$, $t = 0.37$, $p > .05$) and Nutrition Adequacy (NA) ($\beta = -0.069$, $t = 0.52$, $p > .05$) had no significant effects on Food Quality (FQ); therefore, H1 and H2 were not supported. Conversely, Food Handling (FH) ($\beta = 0.673$, $t = 7.09$, $p < .001$) and Price (P) ($\beta = 0.284$, $t = 1.87$, $p < .05$) had significant positive effects on FQ, thereby supporting H3 and H4. Vegetarian and Vegan Menu Options (VVMO) also showed a small but significant effect on FQ ($\beta = -0.011$, $t = 0.08$, $p < .05$), supporting H5. Additionally, VVMO had a significant positive relationship with Satisfaction (S) ($\beta = 0.466$, $t = 5.07$, $p < .001$), confirming H6, whereas the effect of FQ on S ($\beta = 0.510$, $t = 4.46$, $p > .05$) was not significant, leading to the rejection of H7.

Table 4. Summary of Hypotheses Test Results ($n=41$)

Hypothesis	Paths	Path Coefficient (β)	t Statistics	p-value	Conclusions
H1	SA → FQ	0.058	0.374	0.000	Not Supported
H2	NA → FQ	-0.069	0.516	0.000	Not Supported
H3	FH → FQ	0.673	7.090	0.923	Supported
H4	P → FQ	0.284	1.868	0.034	Supported
H5	VVMO → FQ	-0.011	0.080	0.419	Supported
H6	VVMO → S	0.466	5.069	0.308	Supported
H6	FQ → S	0.510	4.464	0.000	Not Supported

5. Conclusion

5.1 Discussion

This study examined vegetarian and vegan food provision in Busan from the perspective of international students in institutional and commercial foodservice settings. Findings indicate that food quality, especially taste, freshness, and presentation, is the primary driver of satisfaction, consistent with previous research (Namkung & Jang, 2007; Han & Ryu, 2009). Although service availability and nutritional adequacy were statistically significant, their impact on perceived quality was limited, suggesting students prioritize taste and quality over convenience and nutrition (Papadaki & Scott, 2002; Alakaam et al., 2015). Food hygiene and pricing influenced satisfaction only when paired with high food quality (Redmond & Griffith, 2003; Bleich et al., 2015). Therefore, improving meal variety, cultural appropriateness, nutritional clarity, and sensory appeal is essential.

5.2. Theoretical Implication

The findings of this study offer significant theoretical contributions to the fields of hospitality management, consumer behaviour, and foodservice quality assessment. The positive relationship established between perceived food quality and customer satisfaction not only reinforces established frameworks in service quality and satisfaction

theory but also extends their applicability to institutional and culturally diverse foodservice settings, such as university cafeterias serving international students.

First, this research substantiates and expands Oliver (1980), which posits that satisfaction is determined by the gap between consumer expectations and perceived performance. The results indicate that when the multidimensional aspects of food quality, such as taste, freshness, temperature, nutrition, and hygiene, meet or exceed the expectations of diners, especially those from diverse cultural backgrounds, higher satisfaction levels ensue. This confirms previous research by Namkung and Jang (2007), who emphasised that food presentation, taste, and freshness are among the strongest predictors of satisfaction in the restaurant sector. However, this study extends the theoretical framework by illustrating that these attributes remain equally critical in institutional settings like university cafeterias, which are often overlooked in hospitality research.

Second, the study contributes to the Parasuraman et al., (1988), traditionally used to measure service quality across five dimensions: tangibles, reliability, responsiveness, assurance, and empathy. By focusing explicitly on the "tangibles" of food appearance, hygiene, and nutritional content, this research offers a refined lens through which to evaluate the role of product quality (i.e., food). This aligns with the findings of Han and Ryu (2009), who established a direct structural link between food quality and customer satisfaction, highlighting that food quality is not merely an antecedent to satisfaction but a strategic asset in fostering customer loyalty.

Third, this research enhances Ajzen (1991) by elucidating how attitudes toward food quality influence behavioural intentions such as revisit likelihood and word-of-mouth recommendations. In line with Liu and Jang (2009), who found that sensory aspects of food had a stronger effect on satisfaction than environmental or service factors, this study supports the notion that positive evaluations of food quality lead to favourable behavioural outcomes, a crucial consideration for institutions aiming to retain student diners and promote healthy eating habits. The present study builds on this by emphasising that these variables are particularly salient among international students, for whom food is not just nourishment but also a marker of cultural comfort and well-being.

Thus, this study contributes to cross-cultural consumer behaviour theory, suggesting that foodservice satisfaction models must consider cultural congruence and dietary inclusivity when evaluating institutional performance. The empirical support for the hypothesis that food quality positively influences satisfaction provides a robust basis for future theory building and model development in hospitality and foodservice research.

5.3 Practical Implications

The outcomes of this study provide several valuable practical implications for foodservice managers, university administrators, and policymakers aiming to enhance satisfaction among diverse customer bases, particularly international students in institutional and commercial foodservice settings.

First, the findings affirm that enhancing food quality is a strategic lever for improving customer satisfaction, as supported by Namkung and Jang (2007) and Han and Ryu (2009). This underscores the need for foodservice operators to invest in the consistent delivery of high-quality meals that meet expectations in taste, freshness, presentation, and nutritional adequacy. By focusing on the sensory and functional attributes of food, institutions can directly influence satisfaction and increase students' willingness to continue using on-campus dining facilities.

Second, for universities catering to international students, the study's emphasis on food quality highlights the importance of culturally inclusive menu planning. As Kwon et al., (2009) indicated, student satisfaction is tied to variety and perceived nutritional value, which suggests that diverse, balanced offerings, especially those incorporating vegetarian, vegan, and culturally familiar dishes, are crucial for meeting the dietary needs and expectations of a multicultural student population. Foodservice managers should therefore conduct regular assessments of menu variety and solicit feedback from international students to ensure inclusivity and relevance.

Third, the results support the integration of food hygiene and safety protocols as core dimensions of perceived food quality. According to Johns and Pine (2002), hygiene is a non-negotiable component in consumer evaluations of food quality. Institutional foodservice providers must ensure adherence to strict sanitation standards, transparent

food handling practices, and visible cleanliness to foster trust and satisfaction. Regular staff training and compliance audits can serve as mechanisms to uphold these standards.

Finally, the study encourages cross-functional collaboration among nutritionists, chefs, marketing staff, and student affairs professionals to design dining programs that are both health-promoting and satisfying. For example, involving international student representatives in menu development and satisfaction surveys can ensure responsiveness to evolving needs and enhance the sense of belonging among international diners.

5.4 Limitations and Future Research

This study contributes valuable insights into the relationship between vegetarian/vegan menu options, food hygiene, perceived food quality, and customer satisfaction, particularly among international students in institutional and commercial foodservice settings.

One primary limitation is the reliance on secondary data and literature-based analysis, which, though grounded in established scholarship (e.g., Namkung & Jang, 2007; Kwon et al., 2009), limits the inclusion of real-time student experiences. These earlier studies, while rigorous, reflect specific cultural or institutional contexts (e.g., Korean universities or Western commercial dining) and may not fully represent the dynamic preferences of today's diverse student populations. As Seo et al. (2019) observed, international students may demonstrate heightened sensitivity to food hygiene and quality due to cultural and dietary differences, suggesting the need for more localised, up-to-date research.

Secondly, constructs such as food quality and satisfaction are inherently subjective and multidimensional (Johns & Pine, 2002; Liu & Jang, 2009). Perceptions of quality may vary considerably based on individual taste, cultural background, dietary history, or familiarity with vegetarian/vegan cuisine. This variability presents challenges in drawing universally applicable conclusions. Furthermore, the reliance on cross-sectional data, as seen in many of the studies reviewed (e.g., Han & Ryu, 2009), limits causal inference and obscures temporal changes in satisfaction. Additionally, several of the key studies used self-reported survey data (e.g., Redmond & Griffith, 2003; Clayton et al., 2002), which may be prone to recall bias or social desirability effects. While such data are useful for gauging perceptions, they may not always align with actual behaviour or

objective food quality standards. Furthermore, mixed-methods approaches combining surveys, focus groups, and observational techniques can help contextualise satisfaction beyond numeric scales and provide a richer understanding of the student dining experience (Choe et al., 2012). Future studies could also benefit from examining mediating and moderating factors, such as cultural food values, prior exposure to vegetarian or vegan diets, or trust in institutional food providers. Nam and Lee (2016) emphasised the importance of trust and cultural familiarity in shaping perceptions of food safety among international students, suggesting that future models of satisfaction should incorporate these variables.

Lastly, with increasing emphasis on sustainability and digital transformation in the foodservice industry, future research could examine the role of green certifications, eco-friendly practices, and technological tools like AI-based menu personalisation or mobile ordering systems in shaping perceptions of quality and satisfaction.

In conclusion, future research should build upon this foundational work by integrating real-world data, culturally sensitive instruments, and multidisciplinary methods to produce a more nuanced and globally relevant understanding of how vegetarian/vegan options and food quality intersect with satisfaction in institutional and commercial foodservice contexts.

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