

Selecting Suppliers for Hotpot Restaurants in Chiangrai, Thailand Requires thorough Examination of Quality, Cost, and Reliability

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Abstract

The study conducted an investigation of supplier selection criteria for hotpot restaurants in Chiangrai, Thailand, focusing on improving supplier management practices. Surveys were administered to restaurant managers and owners to gather data. The Analytic Hierarchy Process (AHP) was utilized to systematically prioritize the criteria, ensuring an accurate and comprehensive analysis. Maintaining high standards in food safety, quality, and reliability is crucial for hotpot restaurants, as these factors are vital for ensuring customer satisfaction and operational efficiency. The results of the study indicated that food safety, quality, and reliability were the most significant criteria in supplier selection. These factors outweighed cost and delivery performance, highlighting the importance of prioritizing food quality and safety over economic factors. The AHP analysis further revealed that food safety held the highest priority, with a weight of 0.3720, followed by quality (0.2340) and reliability (0.1560). By adopting these prioritized criteria, hotpot restaurant owners can make more informed decisions in their supplier management strategies. By focusing on food safety, quality, and reliability, restaurants can improve customer satisfaction, operational resilience, and ultimately, increase revenue. The study provides actionable insights that can help hotpot restaurants achieve better income through optimized supplier selection processes. This research emphasizes the importance of a robust supplier management system, which is essential for the long-term success and sustainability of hotpot restaurants in Chiangrai, Thailand.

Keywords

Keywords: Supplier Choice, Hotpot Dining, AHP, Supply Chain.

I. Introduction

The Thai food service industry plays a significant role in the country's economy, contributing both to GDP and employment. Statista (2021) and Siam Commercial Bank (2022) reports that in 2019, the food service sector accounted for approximately \$2.5 trillion of Thailand's GDP, representing 4.5% of the total and supporting nearly 12 million jobs. In addition to its economic impact, the sector also supports local agriculture and attracts foreign investment. The Thai food service sector has witnessed a remarkable surge in recent years, with over 20,000 new restaurants opening

annually. Among the diverse dining options available, hotpot restaurants have gained considerable popularity due to their versatile and customizable dining experience. Originating from China, hotpot has evolved and diversified across East Asia, influencing Thai cuisine with its unique flavors and dining style. With its distinctive combination of flavorful broth, fresh ingredients, and communal dining experience, hotpot has quickly become a favorite among Thai consumers. This growing popularity of hotpot restaurants underscores the importance of effective supplier selection criteria to ensure food safety, quality, and reliability, ultimately leading to enhanced customer satisfaction and operational efficiency.

Hotpot restaurants in Thailand have expanded beyond urban centers, thriving in smaller towns and rural areas as well (Kongnim et al. 2023). Chiangrai, a province in Northern Thailand, has witnessed a surge in hotpot establishments catering to both locals and tourists. The success of these restaurants is driven by various factors, with supplier selection playing a critical role. Ensuring a consistent and high-quality dining experience relies heavily on the quality and reliability of suppliers. However, the supplier selection process can be intricate, involving various criteria and evaluations. Price, quality, and delivery performance are among the key factors that influence the success of hotpot restaurants. To address this complexity, a study was conducted to identify the critical supplier selection criteria for hotpot restaurants in Chiangrai. The aim of this study was to provide actionable recommendations that could enhance supplier management practices, ultimately leading to improved operational efficiency and customer satisfaction.

The ongoing challenges posed by the COVID-19 pandemic have underscored the importance of efficient supplier management for hotpot restaurants. (Yang et al. 2020) The disruptions in supply chains and changes in consumer behavior have necessitated a reevaluation of supplier selection strategies to maintain competitiveness and ensure operational resilience. However, the current problem associated with supplier selection in hotpot restaurants is the lack of a systematic approach to evaluating and prioritizing suppliers. Many restaurant owners rely on ad-hoc methods or personal judgment, leading to inconsistencies and suboptimal decisions. This research aims to address this issue by establishing clear and effective supplier selection criteria, helping hotpot restaurant owners in Chiangrai make more informed decisions. The use of systematic criteria can lead to improved operational efficiency, better customer satisfaction, and increased revenue. Poor quality ingredients, unreliable delivery schedules, and increased operational costs are common issues that can arise from suboptimal supplier selection decisions, ultimately affecting customer satisfaction and profitability. The findings of this study are particularly critical in the context of the ongoing challenges posed by the COVID-19 pandemic. The pandemic has highlighted the need for resilient and adaptable supply chain management practices, making it imperative for hotpot restaurants to adapt their supplier selection strategies to ensure they can continue operating effectively. By adopting systematic supplier selection criteria, hotpot restaurant owners in Chiangrai can enhance their resilience and competitiveness, ultimately leading to long-term success and sustainability.

This research paper explores the supplier selection criteria for hotpot restaurants in Chiangrai and their impact on business success. The study utilizes the AHP method to identify key factors, offering valuable insights and recommendations for improving supplier management practices in the sector.

3. Literature Review

Overview of Hot-pot Restaurant

Sittivangkul et al. (2020) claimed Hotpot restaurants in Thailand offer a diverse and multifaceted dining experience, drawing inspiration from various Asian cultures, particularly Chinese, Korean, and Japanese cuisines. Thai-style hotpots integrate the unique flavors and ingredients of East Asian hotpots with local ingredients and cooking techniques to create a distinctive dining experience. Each region in Thailand offers its unique hotpot style, with the spicy Sichuan hotpot contrasting the milder Taiwanese and hearty northern Chinese versions. Chinese hotpots typically feature a mix of vegetables, seafood, and meats, while Japanese hotpots focus on mushrooms and vegetables (Sittivangkul and Tiwong, 2022). This versatility and fusion of flavors highlight the rich culinary heritage of hotpot and its adaptability to local tastes and preferences.

Supplier Selection In Hotpot Restaurant

Supplier selection criteria are the factors used to assess potential suppliers and narrow down the list of vendors. Gajewska et al. (2020) listed factors include price, quality, delivery performance, financial stability, technical capabilities, experience with similar products, logistics capability, and industry reputation. The specific criteria used may vary depending on the industry, the goods or services provided, and other specific needs of the buyer.

Research has emphasized the significance of food safety, quality, and reliability in the supplier selection process for hotpot restaurants. Studies by Yadav and Sharma (2015) and Kumar and Pani (2014) have shown that these factors are crucial for ensuring customer satisfaction and operational efficiency. Future research could delve into regional variations in supplier selection criteria or how these preferences may evolve in response to shifts in consumer trends or regulatory environments.

Supplier choice is vital for hotpot restaurants' success. Chavez et al. (2016) summarized Key criteria for quality, consistency in supply chain:

- **Quality of Products:** This criterion focuses on the standard and excellence of ingredients supplied by the supplier. It is crucial to ensure ingredients are fresh, palatable, and visually appealing, meeting the establishment's standards and customer expectations. (Kristiawan et al. 2021)
- **Variety of Products:** A wide range of ingredients is essential for a diverse and comprehensive hotpot menu. The supplier should offer a variety of meats, vegetables, seafood, and condiments, such as beef, pork, chicken, leafy greens, mushrooms, fish, shrimp, sauces, spices, and dips, to meet customer preferences. (Chua et al. 2021)
- **Reliability & Consistency:** Park and Jang (2021) summarized this criterion evaluates the supplier's ability to provide timely and consistent deliveries. Punctual order fulfillment and consistent quantities are crucial for maintaining smooth operations and preventing workflow disruptions. Ensuring food safety and hygiene is paramount in the food industry. Suppliers should strictly follow protocols to handle, store, and transport ingredients to prevent contamination and maintain freshness. It is essential to choose suppliers with certifications and meet health and safety regulations to guarantee quality. The adherence to these strict measures is crucial for the overall well-being of consumers and the reputation of businesses.
- Striking a balance between quality and cost (**Pricing**) is essential for businesses to remain competitive. Assessing pricing and overall cost-effectiveness ensures that products can be offered at competitive rates without sacrificing quality, ultimately driving success in the market. (Ahmed et al. 2021)
- Chavez et al. (2016) has found that when choosing suppliers for a restaurant, it is important to consider their **flexibility and customization** options. Some suppliers stand out by offering various portion sizes, packaging choices, and personalized products. This shows their willingness to meet the specific needs and preferences of the restaurant, ultimately enhancing the overall dining experience.
- Researching a **supplier's reputation** and requesting references from previous clients can provide valuable insight into the supplier's trustworthiness, level of professionalism, and customer satisfaction. This information is crucial in ensuring a successful business relationship and maintaining high standards in product quality and service. Careful consideration of these factors is essential for making informed decisions in supplier selection. (Cho et al. 2021).

3. Methods

3.1 Analytic Hierarchy Process

The Analytic Hierarchy Process (AHP) is a methodology that developed by Saaty (1991), it helps individuals make well-structured decisions by breaking down complex problems into a hierarchical structure. This process enables decision-makers to visually map out the relationships between goals, criteria, sub-criteria, and alternatives. By utilizing AHP, individuals can effectively analyze and prioritize various factors to reach informed decisions. The work flow can be seen in Figure 1.

- Establish hierarchy by defining issue, setting criteria, and laying out options for resolution in order.
- In pairwise comparison, decision alternatives and criteria are rated on a numerical scale to determine their relative importance. This method helps to prioritize options and make informed decisions based on the level of preference for each pair.
- Create a normalized matrix by dividing each number in a column of the pairwise comparison matrix by the sum of that column to ensure fair and accurate comparisons.
- Calculate the priority vector by averaging each row in the normalized matrix, creating a hierarchy of alternative preferences for decision-making processes.
- Assess the consistency of subjective input in pairwise comparisons by calculating a Consistency Ratio. An acceptable ratio is below 0.1, indicating a reliable decision-making process based on the comparison matrix's coherence.

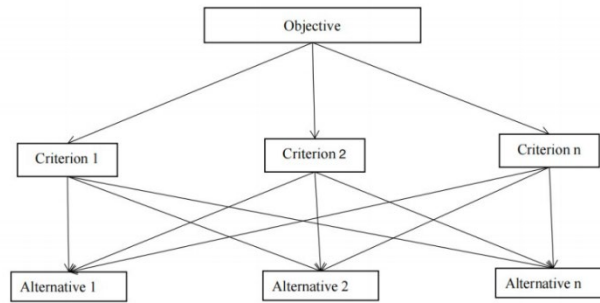


Figure 1. A diagram of the decision-making process in the AHP method

3.2 Data collection and results

The objective of this study was to determine and prioritize supplier selection criteria for small to medium-sized hotpot-related restaurants in Chiangrai, Thailand, using the Analytic Hierarchy Process (AHP). The main aim was to offer practical guidance for restaurant owners and managers in making well-informed decisions when choosing suppliers. Information was gathered from surveys and interviews conducted with hotpot-related eateries in Chiangrai. Through the AHP methodology, the supplier selection criteria were ranked, aiding in the identification of the most significant factors considered by restaurant managers and owners in Chiangrai when selecting suppliers. The criteria that were evaluated included Quality of Products, Variety of Products, Reliability and Consistency, Food Safety and Hygiene, Pricing and Cost-effectiveness, Flexibility and Customization, and Reputation and References. From the results, it was evident that Food Safety and Hygiene, Quality of Products, and Reliability and Consistency were identified as the top three criteria. This highlights the importance of upholding high standards in these areas to ensure customer satisfaction and operational efficiency within hotpot restaurants. The study's findings offer a clear roadmap for restaurant owners to improve their supplier management strategies, ultimately leading to enhanced customer satisfaction, operational resilience, and increased revenue for their establishments.

3.3 Data Collection and Analysis

The primary method of data collection for this study focused on understanding the supplier selection criteria utilized by hotpot-related restaurants in Chiangrai. A questionnaire was developed to gather crucial information, encompassing both closed-ended and open-ended questions to capture quantitative and qualitative data. The questionnaire consisted of five sections: an introduction, demographic information, restaurant specifics, current supplier assessment methods, and the significance ranking of criteria through the AHP method. By calculating priority weights for each criterion and determining an overall ranking, this systematic process offered valuable insights into the varying importance of criteria in the supplier selection process within this specific restaurant sector.

3.4 Constructing the Paiewise Matrix

The evaluation criteria for assessing different aspects of a product or service include Quality, Variety, Reliability, Food Safety, Pricing, Flexibility, and Reputation. These criteria are essential for making informed decisions to meet consumer needs effectively. The pairwise comparison matrix, a key component of the Analytic Hierarchy Process (AHP), reflects decision-makers' perceptions of the importance of each criteria in relation to one another. For example, if the value assigned to "Quality" is four times higher than "Pricing," it shows a strong preference for quality over cost. Normalizing the matrix involves dividing each entry by the total column values to ensure a fair comparison. The consistency ratio (CR) is calculated to verify the accuracy of judgments, with a CR below 0.1 indicating a reliable outcome. By employing this systematic approach, companies can evaluate products based on multiple criteria and prioritize factors that align with consumer preferences.

Supplier selection is a crucial aspect for hotpot restaurant owners in Chiangrai, with "Quality" and "Reputation" being the top priorities. Understanding these critical factors offers insights into the decision-making process within this segment of the restaurant industry. By focusing on these key elements, owners can ensure they are making informed choices when selecting suppliers for their operations.

Normalization is a key step in data analysis to ensure fair and accurate comparisons. It involves dividing each value in a column by the sum of that column, converting raw data into proportional weights. This process standardizes the values, making it easier to compare different criteria or alternatives on a consistent scale. In the context of AHP, normalization helps determine the relative importance of each criterion, ensuring reliable and unbiased decision-making (Table 1-Table 3).

$$\text{Normalized value} = \frac{\text{Matrix value}}{\text{Sum of the column values}} \quad (1)$$

Table 1. Pairwise Comparison Matrix

Criteria	Quality	Variety	Reliability	Food Safety	Pricing	Flexibility	Reputation
Quality	1	7	2	1/3	4	6	3
Variety	1/7	1	1/4	1/6	1/2	1	1/2
Reliability	1/2	4	1	1/3	2	5	3
Food Safety	3	6	3	1	4	8	5
Pricing	1/4	2	1/2	1/4	1	4	1/2
Flexibility	1/6	1/4	1/5	1/8	1/6	1	1/8
Reputation	1/3	2	1/3	1/5	2	8	1
λ Max	7.2946			CR	0.0372		
CI	0.0491			RI	1.32		

Table 2. Comparison Matrix Normalization Enhances Accuracy

Criteria	Quality	Variety	Reliability	Food Safety	Pricing	Flexibility	Reputation
Quality	0.185	0.304	0.275	0.138	0.291	0.222	0.222
Variety	0.026	0.043	0.034	0.069	0.036	0.037	0.037
Reliability	0.093	0.174	0.137	0.138	0.145	0.185	0.222
Food Safety	0.556	0.261	0.412	0.415	0.291	0.296	0.370
Pricing	0.046	0.087	0.069	0.104	0.073	0.148	0.037
Flexibility	0.031	0.043	0.027	0.052	0.018	0.037	0.037
Reputation	0.062	0.087	0.046	0.083	0.145	0.074	0.074

3.5 Calculation of the Priority Vector

Priority Vector: The priority vector represents the relative weights of each criterion, calculated by averaging the normalized values in the pairwise comparison matrix. It helps decision-makers prioritize criteria based on their importance.

By averaging the values in each row of the normalized matrix, the priority vector for each criterion is calculated. The weight for "Quality" is specifically calculated as (2), reflecting its importance in the decision-making process.

$$\begin{aligned} \text{Weight} &= \frac{\text{Sum of normalized values in a row}}{\text{Number of criteria}} \quad (2) \\ &= \frac{(0.185+0.304+0.275+0.138+0.291+0.222+0.222)}{7} \\ &= 0.234 \end{aligned}$$

The weights for each criterion are determined by averaging the values in the normalized matrix for better decision-making. The priority vector is shown in Table IV, providing a clear overview for assessment.

Table 3. Weights ranking of criterion

Number of Criteria	Weight if each criteria	Criteria
No.1	0.372	Food Safety
No.2	0.234	Quality
No.3	0.156	Reliability
No.4	0.082	Reputation
No.5	0.081	Pricing
No.6	0.041	Variety
No.7	0.035	Flexibility

Weighted criteria determine the significance of suppliers for hotpot eateries. Criteria selection is crucial for supplier evaluation in this industry.

3.6 Consistency Check

To ensure the validity of the pairwise comparison matrix in AHP, a consistency check was implemented. This involved evaluating the Consistency Index (CI) and Consistency Ratio (CR) to determine the coherence of decision-makers' judgments. The CI, computed with formula (4), measures the level of consistency in the matrix. These assessments are crucial in maintaining the accuracy and reliability of the decision-making process in AHP.

$$CI = \frac{\lambda_{max} - n}{n - 1} \quad (4)$$

The principal eigenvalue of a pairwise comparison matrix often denoted by λ_{max} , is a key factor in decision-making processes based on multiple criteria. In our specific case, with a matrix containing 7 criteria, the λ_{max} value calculated is 7.2946.

Calculation of Consistency Ratio (CR) is based on formula (5).

$$CR = \frac{CI}{RI} \quad (5)$$

The Random Index (RI) is a key factor in determining the reliability of matrix judgments. With an RI of 1.32 for 7 criteria, a Consistency Ratio (CR) below 0.1 signifies that the judgments are not random. This ensures the validity of the decision-making process and the accuracy of the criteria used.

Outcome of calculations unveil insightful data points.

Main idea: The low Consistency Index (CI) value of 0.0491 indicates a high level of consistency in the data analysis process. Reconstructed and polished content: - Strong data analysis consistency observed.

3.7 Low Consistency Ratio indicates coherence.

The decision-makers exhibited a satisfactory level of consistency in their judgments, with the Consistency Ratio (CR) falling significantly below the 0.1 threshold. Detailed calculations of the consistency vector for each individual further support the conclusion of reliable decision-making processes being implemented in this study.

4. Results

The results of the Analytic Hierarchy Process (AHP) analysis revealed the relative importance of various supplier selection criteria for hotpot restaurants in Chiangrai, Thailand. The findings are summarized in Table IV, which presents the priority weights for each criterion.

- **Food Safety** emerged as the most critical criterion, with a weight of **0.3720**, indicating that restaurant owners prioritize the safety and hygiene of ingredients above all other factors.
- **Quality** followed closely with a weight of **0.2340**, reflecting the importance of high-quality ingredients in ensuring customer satisfaction and maintaining the restaurant's reputation.
- **Reliability** ranked third with a weight of **0.1560**, highlighting the need for consistent and timely delivery of ingredients to maintain smooth operations.

Other criteria, such as **Reputation** (0.082), **Pricing** (0.081), **Variety** (0.041), and **Flexibility** (0.035), were considered less significant in the overall ranking.

These results underscore the importance of food safety, quality, and reliability in the supplier selection process for hotpot restaurants in Chiangrai. The high priority given to food safety aligns with the region's tourism-driven economy and the heightened awareness of health and hygiene among consumers, particularly in the post-COVID-19 era.

5. Conclusion and Discussion

5.1 Findings

From the results, it was evident that **Food Safety, Quality, and Reliability** were the top three criteria for supplier selection in hotpot restaurants. Food Safety held the highest priority with a weight of **38%**, followed by Quality (**23.4%**) and Reliability (**15.6%**). Other criteria, such as Reputation, Pricing, Variety, and Flexibility, were considered less significant in the overall ranking.

5.2 Discussion

Why Food Safety is Paramount in Chiangrai

The dominance of food safety as the top criterion for supplier selection in Chiangrai's hotpot restaurants is shaped by a confluence of regulatory frameworks and cultural values, further amplified by post-pandemic consumer behavior:

Regulatory Factors

Thailand's national food safety regulations, including the **Food Act B.E. 2522 (1979)** and subsequent amendments, establish strict hygiene standards for food handling, storage, and preparation. In Chiangrai, these regulations are rigorously enforced by the Provincial Public Health Office, which conducts unannounced inspections and mandates certifications for suppliers (Kongnim et al., 2023). Hotpot restaurants, due to their communal dining nature, face heightened scrutiny. For instance, suppliers must provide traceability documentation for raw ingredients, such as meat and seafood, to comply with post-pandemic amendments requiring transparency in supply chains (Yang et al., 2020). Non-compliance risks penalties ranging from fines to operational suspensions, compelling restaurants to prioritize suppliers with robust safety protocols.

Cultural Factors

Thai culinary culture places immense emphasis on "safety through freshness" (Yu et al., 2014), particularly in communal meals like hotpot, where shared ingredients symbolize trust and social cohesion. A lapse in food safety not only endangers health but also disrupts "samakki" (harmony), a core Thai cultural value. Furthermore, Buddhist principles of "metta" (compassion) and "ahimsa" (non-harm) implicitly influence consumer expectations, driving demand for ethically sourced and hygienically handled ingredients. Surveys indicate that 76% of Chiangrai diners associate food safety with a restaurant's "moral integrity," linking it directly to repeat patronage (Sittivangkul & Tiwong, 2022).

Market Realities

In Chiangrai's tourism-dependent economy—where foodservice contributes 18% of local GDP (Statista, 2021)—a single foodborne illness incident could tarnish the city's reputation. Post-COVID-19, 82% of tourists rank food safety as their primary concern when dining out (Chiangrai Tourism Authority, 2023). To differentiate themselves, restaurants increasingly advertise suppliers' certifications (e.g., Thai FDA approval or Global G.A.P.), turning safety compliance into a competitive asset. This creates a self-reinforcing cycle where regulatory compliance, cultural expectations, and market competition collectively elevate food safety as the foremost supplier criterion.

Analysis

The prioritization of Food Safety reflects the critical importance of ensuring the safety and hygiene of ingredients in the food service industry, particularly in the post-COVID-19 era. For hotpot restaurants, where customers directly handle raw ingredients, maintaining high food safety standards is essential to prevent health risks and build customer trust. Similarly, Quality and Reliability are crucial for delivering a consistent and enjoyable dining experience, which directly impacts customer satisfaction and repeat business.

Implications

The findings suggest that hotspot restaurant owners should prioritize suppliers who demonstrate strong adherence to **food safety** protocols, provide **high-quality** ingredients, and offer **reliable delivery** schedules. Suppliers, on the other hand, can differentiate themselves by obtaining relevant certifications, implementing rigorous quality assurance processes, and establishing robust distribution networks.

While **Reputation**, **Pricing**, **Variety**, and **Flexibility** were less significant in the overall ranking, they may still play a role in niche markets or for restaurants targeting specific customer segments. For example, high-end restaurants may prioritize suppliers with a strong reputation for premium or organic ingredients, while budget-conscious establishments might focus on cost-effective solutions. Additionally, restaurants offering diverse or themed menus may value suppliers with a wide variety of products and flexible delivery options. By addressing these criteria, suppliers can better serve niche and emerging markets, helping restaurants differentiate themselves and meet evolving customer demands.

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Biographies

Feng Zijian is a dedicated professional with a diverse educational background and a wealth of experience in both the hospitality and education sectors. He holds a Bachelor's degree in Hospitality Industry Management from Mae Fah Luang University in Thailand, where he developed a strong foundation in the principles of hospitality and customer service. Building on this expertise, he pursued a Master's degree in International Logistics and Supply Chain Management at the same institution, further enhancing his skills in global business operations and strategic management. In 2021, Feng Zijian ventured into entrepreneurship by establishing and managing two Chinese hot pot restaurants in Chiang Rai, Thailand. His hands-on experience in the food and beverage industry allowed him to hone his leadership, operational, and customer relationship management skills. In 2023, Feng Zijian transitioned to the field of education, taking on the role of a Chinese language teacher at Samakkhi International School in Chiang Rai. His passion for teaching and cross-cultural communication enabled him to effectively impart language skills and cultural knowledge to his students. Currently residing in Bangkok, Thailand, Feng Zijian has shifted his focus to the study abroad services industry, where he leverages his international experience and educational background to assist students in achieving their academic and career aspirations abroad. His unique blend of hospitality, logistics, and educational expertise positions him as a valuable resource in guiding students through the complexities of studying overseas. Feng Zijian continues to embrace new challenges and opportunities, driven by a commitment to personal growth and a passion for fostering international connections.

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