Available online at: https://jtos.polban.ac.id/index.php/jtospolban
Journal of Tourism Sustainability
Volume 6 No 2, 2026: 241-258
DOI: 10.35313/jtospolban.v6i2.217

Menu Engineering for Restaurant Performance: Evidence from a Tourism-Oriented Café in Indonesia

M. Romi Okta Viano[1*], Ratih Pitria Purnamasari[2], Budi Wibowo[3], Dodi Affandi[4]
[1-4]Politeknik Pariwisata NHI Bandung, Indonesia

Corresponding: rov@poltekpar-nhi.ac.id

Abstract

Menu engineering is widely used in restaurant management to evaluate menu performance, yet its application in small tourism-oriented culinary businesses remains relatively underexplored, particularly in emerging destination contexts. This study evaluates menu performance at a tourism-oriented café in Indonesia by integrating menu popularity and contribution margin within the conventional menu engineering framework. A quantitative descriptive case-study design was employed using twelve months of operational sales data, covering May 2024 to April 2025. The analysis included 39 food items and utilized actual sales volume, selling prices, and cost of goods sold to calculate Menu Mix percentages and contribution margins before classifying items into the menu engineering matrix. The findings reveal a substantial concentration of Plowhorse items, with 16 menu items (41%) characterized by high popularity but comparatively low contribution margins. Five items were classified as Puzzles, indicating relatively high margins but insufficient sales volume. These patterns suggest that strong customer demand does not necessarily translate into optimal menu profitability. The study demonstrates the practical value of menu engineering as a data-driven diagnostic tool for identifying pricing, cost-control, promotion, and menu-portfolio priorities in small culinary businesses. The findings extend the application of menu engineering to a tourism-oriented café context and highlight how systematic menu-performance evaluation can support operational decision-making and strengthen the economic viability of culinary enterprises within tourism destinations.

Keywords: *Menu Engineering; Menu Performance; Contribution Margin; Restaurant Profitability; Culinary Tourism.*

To Cite This Paper:
M. Romi Okta Viano, Ratih Pitria Purnamasari, Budi Wibowo, Dodi Affandi. (2026). Menu Engineering for Restaurant Performance: Evidence from a Tourism-Oriented Café in Indonesia. *Journal of Tourism Sustainability,* 6(2), 10.35313/jtospolban.v6i2.217.

INTRODUCTION

Restaurant businesses increasingly rely on data-driven decision-making to maintain profitability amid rising food costs, labor expenses, and changing customer demand. Recent restaurant revenue management research shows that profitability is shaped not only by sales volume but also by pricing, product mix, operational efficiency, and demand management (Bujalance-López et al., 2025). At the menu-item level, high popularity does not necessarily produce high profitability because contribution margins and production costs may differ substantially across products (Sousa & Calixto, 2025; Webb et al., 2025). This makes systematic menu evaluation essential for identifying which items should be retained, promoted, repriced, or reformulated.

Menu engineering provides a practical framework for evaluating menu performance through the combined analysis of popularity and contribution margin. Its managerial value lies in converting sales and cost information into actionable categories that support pricing, promotion, and product-portfolio decisions. Earlier applications demonstrated that menu engineering can reveal discrepancies between perceived and actual menu performance (Kwong, 2005), while more recent studies have linked menu analysis with broader restaurant revenue management and profitability strategies (Lai et al., 2019, 2020). Thus, menu engineering remains relevant as a diagnostic tool for improving restaurant performance.

However, contemporary research has also identified limitations in the conventional popularity–profitability model. (Linassi et al., 2016) showed that activity-based costing can improve the accuracy of menu profitability estimates by incorporating traceable operating costs, while (Taylor et al., 2009) proposed a multi-factor approach that considers additional efficiency dimensions. Other studies have extended menu analysis by accounting for substitution effects among menu items (Noone & Cachia, 2020), complementary purchases and total contribution margins (Webb et al., 2025), and customer value through customer-driven menu analysis (Nemeschansky et al., 2020). These developments indicate that menu engineering is increasingly viewed as part of a broader system of restaurant performance management rather than merely a static classification technique.

The relevance of menu performance also extends to the economic sustainability of culinary businesses. Recent studies suggest that systematic menu analysis can support financial sustainability by improving cost control, resource allocation, pricing decisions, and operational efficiency (Gomes et al., 2025). Sustainability in restaurant operations may also be strengthened through more efficient kitchen practices and reduced resource waste (Zick et al., 2025). Nevertheless, conventional menu engineering should not be treated as a direct measure of sustainability. Its contribution is more appropriately understood through improved profitability and operational decision-making, particularly for small tourism-oriented culinary businesses that often operate with limited resources and narrow margins.

Despite these developments, empirical evidence remains limited regarding the application of conventional menu engineering in small tourism-oriented cafés within emerging destination contexts. Much of the literature focuses on larger or analytically advanced restaurant settings, while relatively little attention has been given to how an accessible popularity–contribution margin framework can support managerial decisions in smaller tourism-related enterprises. Therefore, this study evaluates the menu performance of a tourism-oriented café in Indonesia using twelve months of actual operational data covering 39 food items. Specifically, the study examines menu popularity, contribution margins, and Menu Engineering Matrix classifications. By doing so, it provides empirical evidence on how menu engineering can support profitability and operational decision-making and, indirectly, strengthen the economic viability of culinary enterprises within tourism destinations.

LITERATURE REVIEW

Menu Engineering and Restaurant Performance

Menu engineering is a long-established approach for evaluating restaurant menu performance by combining item popularity with contribution margin. Its managerial purpose is to identify which items should be maintained, promoted, repriced, reformulated, or removed from the menu. Empirical applications have shown that menu engineering can reveal substantial differences between perceived and actual product performance, particularly when managerial judgments are not supported by sales and cost data (Kwong, 2005). More recent research continues to position menu analysis as an important component of restaurant performance management because menu composition directly affects revenue generation, cost structure, and profitability (Lai et al., 2019; Lai & Karim, 2023). Accordingly, menu engineering provides a relatively accessible analytical mechanism through which restaurant operators can convert operational data into structured managerial decisions.

The role of menu engineering has increasingly been connected with restaurant revenue management. (Lai et al., 2019) argue that menu analysis and revenue management pursue complementary objectives because both seek to improve profitability through better use of pricing, cost, demand, and performance information. Their subsequent review indicates that contemporary menu-profitability management extends beyond conventional classification toward a broader combination of pricing, customer demand, and operational strategies (Lai et al., 2020). More recently,(Bujalance-López et al., 2025) demonstrates through a systematic review that restaurant revenue management is increasingly driven by analytical approaches involving pricing, demand forecasting, capacity management, technology, and menu optimization. Thus, menu engineering is better understood as one element of a broader restaurant performance-management system rather than merely a descriptive classification technique.

Development and Limitations of Conventional Menu Engineering

Although conventional menu engineering remains widely applicable, its reliance on food cost and contribution margin has been questioned. (Raab et al., 2007) demonstrated that incorporating activity-based costing into traditional menu engineering can substantially change assessments of menu profitability because individual dishes consume different amounts of labor and operating resources. (Raab & Mayer, 2007) similarly showed that combining menu engineering with activity-based costing provides a more accurate representation of menu-item profitability than conventional contribution-margin analysis alone. This argument was further supported by (Linassi et al., 2016), who found that integrating traceable operating costs into menu analysis produces more precise managerial information for menu planning.

Other studies have expanded menu engineering beyond the traditional two-dimensional matrix. (Taylor et al., 2009) introduced a multi-factor approach using data envelopment analysis to incorporate multiple inputs and outputs into menu-performance evaluation. (Chou & Fang, 2013) subsequently demonstrated that surplus-based analysis can provide additional criteria for distinguishing efficient and inefficient menu items. (Tom & Annaraud, 2021) further developed an intelligent decision-support model that integrates several menu-performance indicators through a fuzzy multicriteria approach. These developments indicate that menu performance is multidimensional and that conventional menu engineering, while practical, represents only one level of analytical sophistication.

Customer Choice and Contemporary Menu Analysis

Recent studies have also emphasized that menu performance cannot be interpreted solely through cost and sales indicators. (Nemeschansky et al., 2020) developed a customer-driven menu analysis model that incorporates customer voice alongside cost allocation and profitability measures. Their findings highlight the importance of connecting financial performance with perceived customer value when making menu-management decisions. Similarly, (Gopal et al., 2024) demonstrate that menu design and presentation can affect purchase intention, reinforcing the broader argument that menu performance is influenced not only by the economic characteristics of products but also by how customers perceive and interact with menu information.

The interdependence among menu items further complicates traditional analysis. (Noone & Cachia, 2020) showed that conventional menu engineering may generate incomplete pricing and placement decisions when substitution effects among menu items are ignored. (Webb et al.,

2025) extend this perspective by demonstrating that restaurant profitability can be improved when complementary purchasing behavior is considered rather than evaluating individual products in isolation. Their findings suggest that the economic contribution of a menu item may exceed its direct contribution margin if it stimulates additional purchases. Contemporary menu analysis therefore increasingly recognizes customer choice, product relationships, and transaction-level behavior as important extensions of the traditional popularity–profitability framework.

Menu Performance, Profitability, and Financial Sustainability

The relationship between menu management and financial sustainability has become increasingly important in recent hospitality research. (Gomes et al., 2025) show that systematic menu-performance analysis can support restaurant financial sustainability by distinguishing profitable products from items requiring managerial intervention. Their findings reinforce the importance of combining menu-performance indicators with managerial strategies concerning pricing, promotion, and cost control. Similarly, (Sousa & Calixto, 2025) demonstrates that ingredient yield and portion-level costs can materially influence restaurant financial performance, illustrating the importance of detailed cost information when assessing the profitability of menu items.

Evidence also suggests that culturally and locally embedded menu strategies can contribute to financial resilience. (Mashige et al., 2025), for example, found that culturally specific dishes in a hospitality setting generated favorable sales and contribution margins while locally sourced ingredients reduced food-cost percentages. Their findings illustrate how menu performance can intersect with local culinary identity and financially sustainable hospitality operations. At the broader operational level, (Zick et al., 2025) emphasize that sustainability in professional kitchens is associated with resource efficiency, managerial practices, and operational competencies. However, menu engineering itself should not be interpreted as a direct measure of environmental or social sustainability. Its strongest contribution lies in improving profitability, cost control, resource allocation, and operational decision-making, which may subsequently strengthen the financial viability of restaurant businesses.

Research Positioning

The literature demonstrates a clear evolution from conventional menu engineering toward more integrated approaches involving activity-based costing, multi-factor analysis, revenue management, customer value, substitution effects, complementary purchasing behavior, and financial sustainability (Linassi et al., 2016; Nemeschansky et al., 2020; Noone & Cachia, 2020; Taylor et al., 2009; Webb et al., 2025). These advanced approaches provide greater analytical precision but often require detailed transaction-level, behavioral, or operating-cost data; for smaller culinary businesses, such data and analytical capabilities may not always be available. In such settings, conventional menu engineering remains useful as an accessible first-stage diagnostic tool, provided that its methodological limitations are explicitly acknowledged.

Accordingly, this study positions menu engineering as a practical mechanism for evaluating restaurant performance through menu popularity and contribution margin. These two dimensions provide the basis for menu classification and subsequent managerial decisions concerning pricing, cost control, promotion, and portfolio management. The study does not assume that menu engineering directly produces sustainability outcomes. Instead, improved menu-performance decisions are conceptualized as supporting operational efficiency and financial viability, which may contribute indirectly to the economic sustainability of a tourism-oriented culinary enterprise.

METHODS

Research Design and Study Context

This study employed a quantitative descriptive case-study design to evaluate menu performance at PePeTeKa Café, a tourism-oriented culinary business located in Mekarsari Tourism Village, Ciwidey, West Java, Indonesia. The case-study approach was selected because the analysis focused on the complete menu portfolio of a single establishment and used actual operational records rather than perception-based measures. The unit of analysis was therefore the individual food menu item. The empirical analysis covered a twelve-month operating period from May 2024 to April 2025. A full-year observation period was used to capture menu performance across a complete operational cycle and to reduce the influence of short-term fluctuations in sales. A total of 39 food items available during the observation period were included in the analysis.

Data Sources

The primary dataset consisted of internal operational records obtained from the café. For each menu item, the dataset included sales volume, selling price, and Cost of Goods Sold (COGS). These variables provided the quantitative basis for calculating menu popularity and contribution margin. Interviews with café management were used only as supplementary contextual information to clarify operational practices, pricing decisions, and menu-management conditions. They were not used to determine the quantitative classification of menu items. Consequently, no customer survey or visitor sample was incorporated into the Menu Engineering calculations.

Table 1. Data Structure and Analytical Role

Data	Measurement	Analytical Role
Sales volume	Number of units sold per menu item	Calculation of Menu Mix and popularity
Selling price	Selling price per unit	Calculation of contribution margin
COGS	Cost of goods sold per unit	Calculation of contribution margin
Management information	Contextual operational information	Interpretation of managerial implications

Source: Research data, 2026

Menu Engineering Analysis

Menu performance was evaluated using the conventional Menu Engineering framework, which combines popularity and profitability to classify individual menu items. The analytical process consisted of four stages: calculation of Menu Mix, determination of the popularity threshold, calculation of contribution margin, and classification using the Menu Engineering Matrix.

Menu Popularity

The popularity of each menu item was measured using the Menu Mix percentage (MM%), calculated as:

$$X_i(\%) = \frac{X_i}{\sum_{i=1}^{n} X_i} \times 100$$

where (Q_i) represents the number of units sold for menu item (i), and (n) represents the total number of menu items analyzed.

The popularity benchmark was determined using the conventional 70% rule. The expected average Menu Mix for a portfolio containing (n) items was calculated as (100/n), and the popularity threshold was set at 70% of this average:

$$MM_{threshold} = 0,70 \times \left(\frac{100}{n}\right)$$

With 39 menu items, this procedure provides a uniform reference point for distinguishing relatively high- and low-popularity items. Items with an MM% equal to or above the threshold were categorized as high popularity, whereas those below the threshold were categorized as low popularity.

Contribution Margin

Profitability was assessed through the unit contribution margin, defined as the difference between the selling price and the unit COGS:

$$CM_i = P_i - COGS_i$$

where (CM_i) is the contribution margin of menu item (i), (P_i) is its selling price, and ($COGS_i$) is its cost of goods sold.

The average contribution margin across all analyzed menu items was used as the profitability benchmark:

$$\overline{CM} = \frac{\sum_{i=1}^{n} CM_i}{n}$$

Items with a contribution margin equal to or above the average were classified as high profitability, while those below the average were classified as low profitability.

Menu Engineering Matrix

The popularity and profitability classifications were subsequently combined to position each item within one of four Menu Engineering categories.

Table 2. Menu Engineering Classification Framework

Category	Popularity	Contribution Margin	Managerial Interpretation
Star	High	High	Strong market acceptance and financial contribution
Plowhorse	High	Low	Strong demand but limited unit profitability
Puzzle	Low	High	Financially attractive but underperforming in sales
Dog	Low	Low	Weak performance in both demand and contribution margin

Source: Research data, 2026

The resulting classification was used as the principal basis for interpreting the café's menu structure. Stars were treated as high-performing items requiring performance maintenance; Plowhorses as items requiring margin improvement; Puzzles as items with potential for demand stimulation; and Dogs as items requiring reassessment. However, these managerial interpretations were treated as implications of the empirical classifications rather than as additional variables measured in the study.

Analytical Scope and Methodological Boundaries

The study applies the conventional contribution-margin approach to Menu Engineering. Accordingly, profitability is estimated using selling price and COGS and does not incorporate item-specific labor costs, preparation time, overhead allocation, customer-level purchasing combinations, or substitution effects among menu items. Contemporary menu-analysis research has demonstrated that approaches incorporating activity-based costing, multi-factor efficiency, customer behavior, and product interdependencies may provide more comprehensive profitability estimates (Linassi et al., 2016; Nemeschansky et al., 2020; Noone & Cachia, 2020; Taylor et al., 2009; Webb et al., 2025). The conventional framework was retained in the present study because it corresponds with the operational data available to the café and provides an accessible diagnostic approach for a small tourism-oriented culinary enterprise. The analysis therefore evaluates menu performance rather than sustainability outcomes directly. Any implications concerning economic sustainability are interpreted through the potential contribution of improved menu decisions to profitability, cost management, and financial viability rather than as independently measured sustainability effects.

RESULTS AND DISCUSSION

Overall Menu Performance Profile

The menu-performance analysis covered 39 food items offered at PePeTeKa Café over a twelve-month observation period from May 2024 to April 2025. The analysis was based on actual operational records comprising sales volume, selling price, and Cost of Goods Sold (COGS), which were subsequently used to calculate Menu Mix percentages and contribution margins for each item. The use of a full annual sales cycle provides a sufficiently broad operational basis for evaluating menu performance and reduces the likelihood that the classification reflects only short-term fluctuations in customer demand. The observed menu portfolio displayed substantial variation in customer demand. The highest Menu Mix percentage was recorded for Nasi Goreng Spesial (7.74%), whereas Nasi Ayam Geprek (0.03%) represented the least frequently purchased item during the observation period. This wide difference indicates that customer demand was unevenly distributed across the 39 menu items, suggesting that a relatively small number of products generated considerably stronger market responses than others.

From the profitability perspective, the café applied a standard food-cost policy in which COGS was generally set at approximately 30% of the selling price for food items. Consequently, differences in unit contribution margins were closely associated with variations in selling prices. This cost structure is analytically important because an item with a higher selling price may generate a higher absolute contribution margin even when the food-cost percentage is similar across products. Therefore, menu popularity and unit profitability represent distinct dimensions of performance and should not be interpreted interchangeably.

Table 3. Overall Profile of Menu Performance

Indicator	Observed Profile
Observation period	May 2024–April 2025
Number of menu items	39 food items
Primary data	Sales volume, selling price, and COGS
Highest Menu Mix	Nasi Goreng Spesial (7.74%)
Lowest Menu Mix	Nasi Ayam Geprek (0.03%)
Standard food-cost policy	Approximately 30% of selling price
Popularity indicator	Menu Mix (%)
Profitability indicator	Unit Contribution Margin
Final analytical output	Stars, Plowhorses, Puzzles, and Dogs

Source: Research data, 2026

Overall, the preliminary profile indicates that sales popularity and financial contribution were not uniformly distributed across the menu portfolio. The substantial variation in Menu Mix, combined with differences in absolute contribution margins, provides the empirical basis for distinguishing high- and low-performing menu items. The subsequent analyses therefore examine the two dimensions separately—first through menu popularity and then through contribution-margin performance—before integrating them into the Menu Engineering Matrix.

Menu Popularity Performance

Menu popularity was assessed using the Menu Mix percentage (MM%), which represents the proportion of units sold for each menu item relative to total menu-item sales during the twelve-month observation period. The analysis revealed considerable variation in demand across the 39 food items, indicating that customer purchases were concentrated more strongly on selected products than on others.

The highest Menu Mix percentage was recorded for Nasi Goreng Spesial (7.74%), making it the most frequently purchased food item during the observation period. In contrast, Nasi Ayam Geprek recorded only 0.03%, representing the lowest observed popularity level among the analyzed items. The substantial difference between these two values illustrates the heterogeneous demand structure within the café's menu portfolio. The popularity benchmark was determined using the conventional Menu Engineering rule of 70% of the average Menu Mix. With 39 food items, the theoretical average Menu Mix was calculated as:

$$\frac{100}{39} = 2{,}5641 \; atau \; 2{,}56\%$$

Accordingly, the popularity threshold was: 0,70 x 2,5641% = 1,79%

Menu items with an MM% equal to or greater than approximately 1.79% were therefore classified as having high popularity, while items below this threshold were categorized as having low popularity. This benchmark provides a standardized basis for distinguishing products with relatively strong customer demand from those with weaker sales performance. The popularity results indicate that menu demand was not evenly distributed across the portfolio. Items exceeding the 1.79% benchmark represent products with stronger customer acceptance and greater contribution to overall sales volume—conversely, items below the threshold account for comparatively smaller proportions of total purchases. Importantly, popularity alone does not indicate financial performance because frequently purchased items may still generate relatively low contribution margins. The Menu Mix results should therefore be interpreted together with the profitability analysis presented in the following section.

Table 4. Menu Popularity Classification Framework

Popularity Indicator	Value / Criterion
Number of menu items	39
Average Menu Mix	2.56%
Popularity benchmark	1.79%
High popularity	MM% ≥ 1.79%
Low popularity	MM% < 1.79%
Highest MM%	Nasi Goreng Spesial – 7.74%
Lowest MM%	Nasi Ayam Geprek – 0.03%

Source: Research data, 2026

These findings provide the first dimension of the Menu Engineering Matrix. The popularity classification is subsequently combined with the contribution-margin classification to determine whether individual menu items fall within the Star, Plowhorse, Puzzle, or Dog categories.

Contribution Margin and Profitability Performance

Profitability was evaluated using the unit Contribution Margin (CM), calculated as the difference between the selling price and the Cost of Goods Sold (COGS) for each menu item. In the operational setting of PePeTeKa Café, the standard food-cost policy was approximately 30% of the selling price for food items. Under this structure, the absolute contribution margin of an item is strongly influenced by its selling price, because items with higher selling prices generally generate higher nominal margins even when the food-cost percentage remains relatively similar.

The contribution margin for each item was calculated using:

$$CM_i = P_i - COGS_i$$

where (CM_i) represents the unit contribution margin of menu item (i), (P_i) is its selling price, and ($COGS_i$) is the unit cost of goods sold. The average contribution margin across the 39 menu items was subsequently used as the profitability benchmark. Items with contribution margins equal to or above the average were classified as high profitability, whereas those below the average were classified as low profitability.

The profitability results should be interpreted independently from sales popularity. An item may generate strong demand but remain below the average contribution-margin benchmark, whereas another item may have relatively low sales volume but generate a comparatively high margin per unit. This distinction is central to Menu Engineering because it prevents sales volume from being treated as a direct proxy for profitability. The manuscript's preliminary classification already indicates this divergence: several highly demanded items were classified as Plowhorses, while five low-popularity items were classified as Puzzles, indicating that popularity and profitability did not move uniformly across the menu portfolio.

The standardized food-cost structure also has an important analytical implication. Because COGS was generally maintained at approximately 30% of selling price, the contribution-margin comparison primarily captures differences in the absolute monetary contribution generated by menu items rather than substantial variation in food-cost percentages. Therefore, a higher unit contribution margin does not necessarily indicate greater cost efficiency; it may also reflect a higher selling price. For this reason, the present analysis interprets contribution margin as a measure of unit financial contribution, not as a comprehensive measure of total item-level profitability.

Table 5. Contribution Margin and Profitability Classification Framework

Indicator	Measurement / Criterion
Profitability measure	Unit Contribution Margin
Contribution Margin formula	Selling Price – COGS
Standard food-cost policy	Approximately 30% of selling price
Profitability benchmark	Average CM of all 39 menu items
High profitability	CM ≥ average CM
Low profitability	CM < average CM
Analytical interpretation	Unit financial contribution rather than total profitability

Source: Research data, 2026

The contribution-margin classification provides the second dimension required for the Menu Engineering Matrix. When combined with Menu Mix performance, it enables each item to be positioned according to both customer demand and financial contribution, thereby distinguishing Stars, Plowhorses, Puzzles, and Dogs. The integrated classification is presented in the following section.

Menu Engineering Matrix Classification

The final stage of the analysis integrated Menu Mix and Contribution Margin classifications to position each of the 39 menu items within the Menu Engineering Matrix. Under this framework, Stars represent items with high popularity and high contribution margins, Plowhorses combine high popularity with low contribution margins, Puzzles exhibit low popularity but high contribution margins, and Dogs perform below the respective benchmarks on both dimensions.

The available classification results indicate that Plowhorses constituted the largest explicitly reported category, comprising 16 menu items or approximately 41% of the total menu portfolio. Representative items included *Nasi Ayam Penyet, Pisang Goreng,* and *Cireng Bumbu Rujak*. These items generated relatively strong customer demand but remained below the average contribution-margin benchmark. Their classification therefore illustrates an important distinction between sales volume and unit financial contribution: frequently purchased products do not necessarily represent the strongest profitability performers.

A further five items, representing approximately 13% of the portfolio, were classified as Puzzles. These included *Nasi Timbel Gepuk, Sop Buntut,* and *Nasi Ayam Betutu*. Their relatively high contribution margins indicate stronger unit financial potential, but their low Menu Mix values suggest that this potential was not supported by comparable sales volume. From a portfolio perspective, these items therefore represent products whose financial contribution depends on whether demand can be increased without materially reducing their margins.

Table 6. Reported Menu Engineering Classification

Category	Popularity	Contribution Margin	Number of Items	Percentage	Representative Items
Stars	High	High	*To be verified*	*To be verified*	*To be verified*
Plowhorses	High	Low	16	41%	Nasi Ayam Penyet; Pisang Goreng; Cireng Bumbu Rujak
Puzzles	Low	High	5	~13%	Nasi Timbel Gepuk; Sop Buntut; Nasi Ayam Betutu
Dogs	Low	Low	*To be verified*	*To be verified*	*To be verified*
Total			**39**	**100%**	

Source: Research data, 2026

A critical issue emerges from the current dataset presentation. Although the study reports a total of 39 menu items, only 21 items are numerically accounted for in the available summary classification: 16 Plowhorses and five Puzzles. The numbers of Stars and Dogs are not explicitly reported in the current manuscript, leaving 18 menu items without a verifiable category assignment. Consequently, the complete distribution of the four quadrants should not be inferred until the item-level Menu Mix and Contribution Margin calculations are verified.

The current results nevertheless demonstrate that the menu portfolio contains a substantial proportion of high-demand items whose contribution margins remain comparatively low, alongside a smaller group of higher-margin products with weak demand. This pattern provides preliminary evidence of an imbalance between customer demand and unit financial contribution within the menu portfolio. However, a complete interpretation of portfolio structure—including the relative presence of Stars and Dogs—requires verification of the remaining menu-item classifications.

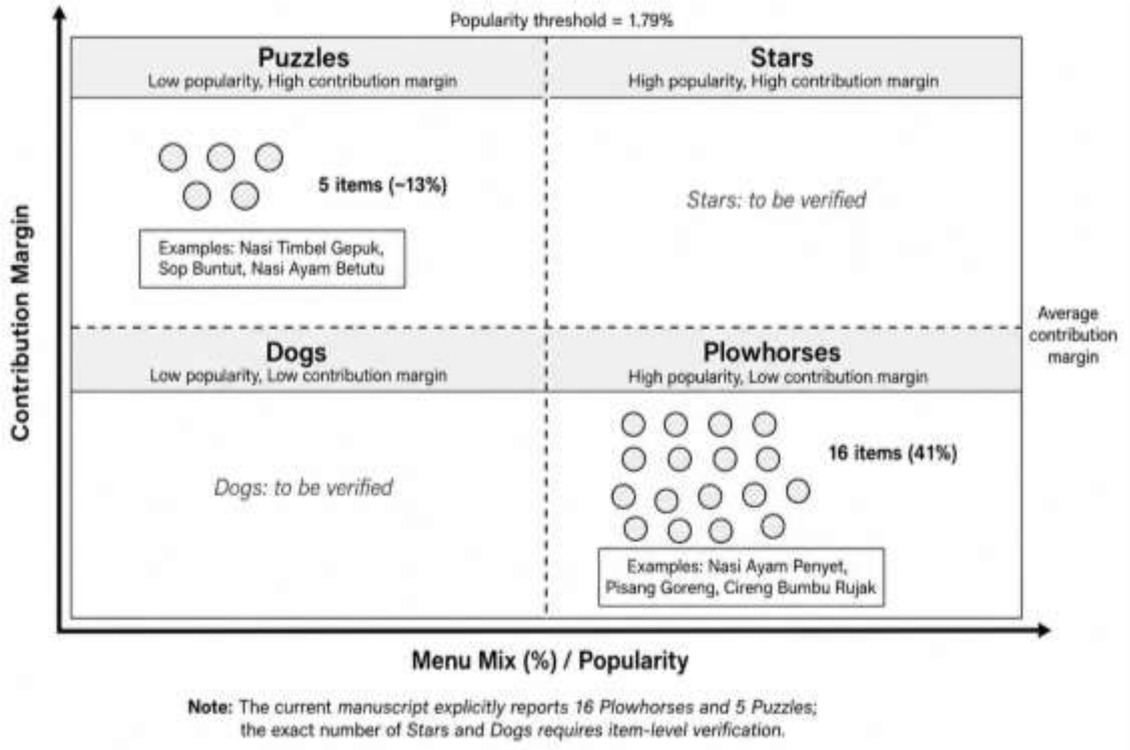

Figure 1. Menu Engineering Matrix of PePeTeKa Café

The final version of the matrix should plot each of the 39 menu items using Menu Mix (%) on the horizontal axis and unit Contribution Margin on the vertical axis, with reference lines representing the 1.79% popularity threshold and the average Contribution Margin. The resulting four quadrants should identify Stars, Plowhorses, Puzzles, and Dogs and provide a visual representation of the café's overall menu-performance structure.

Discussion

Popularity Does Not Necessarily Translate into Profitability

The findings demonstrate that menu popularity and financial contribution do not necessarily move in the same direction. The most notable result is the classification of 16 menu items (41%) as Plowhorses, indicating relatively high customer demand but contribution margins below the profitability benchmark. This pattern suggests that a substantial proportion of PePeTeKa Café's sales activity is generated by products that attract customers but do not provide the strongest unit financial contribution. Thus, sales volume alone provides an incomplete representation of menu performance.

This finding reinforces the fundamental rationale of menu analysis: restaurant performance should not be evaluated solely by the frequency with which an item is purchased. Menu analysis and restaurant revenue management both seek to improve profitability by integrating information on demand, costs, and managerial interventions rather than treating sales volume as an isolated performance indicator (Lai et al., 2019). The broader review by (Lai et al., 2020) similarly emphasizes that menu profitability requires the simultaneous consideration of menu performance and revenue-management mechanisms. More recently, (Bujalance-López et al., 2025) identifies menu engineering as one component of an increasingly data-driven restaurant revenue-management system in which pricing, demand forecasting, operational decisions, and customer behavior collectively influence financial performance.

The PePeTeKa case is particularly instructive because the café applies an approximately standardized food-cost percentage across its food portfolio. Under such a structure, absolute contribution margins are closely associated with selling prices, while differences in sales volume determine the extent to which those margins are realized across the portfolio. Consequently, a popular but relatively low-priced item may attract substantial demand while remaining below the average unit contribution margin. Conversely, a higher-priced item may generate greater contribution per unit despite lower sales. The findings therefore support the analytical separation of popularity and unit financial contribution, which is central to conventional Menu Engineering.

At the same time, the results should not be interpreted as a complete measure of item-level economic profitability. Traditional Menu Engineering primarily relies on food costs when estimating contribution margins, whereas different dishes may require substantially different labor, preparation, and operational resources. (Linassi et al., 2016) demonstrate that incorporating activity-based costing can alter assessments of menu profitability by including traceable operating costs, while (Taylor et al., 2009) show that labor and other cost determinants can produce a more multidimensional evaluation of menu performance. Accordingly, the Plowhorse classification in this study should be interpreted as indicating comparatively low unit contribution margins under the conventional Menu Engineering model, rather than definitive evidence that these items are economically inefficient.

Explaining the Menu Portfolio Structure

The coexistence of a substantial Plowhorse group and five Puzzles indicates an imbalance between demand and unit financial contribution within the café's menu portfolio. Whereas Plowhorses combine high demand with comparatively low contribution margins, Puzzles exhibit the opposite configuration: they generate relatively high contribution margins but remain below the popularity threshold. The five Puzzle items, including Nasi Timbel Gepuk, Sop Buntut, and Nasi Ayam Betutu, therefore represent financially attractive products whose current sales volume limits their contribution to overall menu performance.

This structure is consistent with contemporary arguments that menu items should not be interpreted as independent products whose value can be determined solely from their individual popularity and contribution margins. (Noone & Cachia, 2020) demonstrate that conventional menu-engineering decisions can be incomplete when substitution effects between menu items are ignored. A price change or stronger promotion for one item can alter demand for another item within the same product category. Similarly, (Webb et al., 2025) show that the economic contribution of an entrée can extend beyond its direct contribution margin when complementary purchases are considered. Their transaction-based analysis demonstrates that menu items may stimulate additional purchases that increase the total contribution generated by an order.

These developments are particularly relevant when interpreting the PePeTeKa portfolio. The current operational dataset can identify which items are popular and which generate higher unit contribution margins, but it cannot establish why customers prefer particular items or whether one item stimulates, substitutes for, or complements another purchase. Consequently, the lower popularity of Puzzle items should not automatically be attributed to poor menu design, inadequate promotion, or unfavorable customer perceptions. Such explanations would require additional customer-behavior or transaction-level evidence. (Nemeschansky et al., 2020), for example, demonstrate through customer-driven menu analysis that incorporating customer voice alongside cost allocation and profitability information can provide a more nuanced basis for understanding menu performance.

The tourism-oriented context may nevertheless provide an important basis for future investigation. Studies of culturally embedded cuisine suggest that local culinary characteristics can influence both demand and restaurant financial performance. (Mashige et al., 2025), for instance, found that culturally specific dishes could perform favorably in terms of both sales and contribution margins while supporting locally rooted hospitality operations. However, because the present study does not directly examine tourists' motivations, perceived authenticity, culinary preferences, or local sourcing behavior, such mechanisms should be treated as contextual possibilities rather than empirical explanations for the PePeTeKa classifications.

Implications for Menu Management and Restaurant Performance

The Menu Engineering Matrix provides PePeTeKa Café with a practical basis for prioritizing menu-management interventions, but the appropriate strategy differs across menu categories. For Plowhorses, the principal managerial issue is not insufficient demand but the conversion of high sales activity into stronger financial contribution. Management should therefore first examine food costs, portion standards, ingredient specifications, procurement arrangements, and selling prices before considering more aggressive interventions. Small adjustments may have meaningful financial consequences when applied to items sold in relatively high volumes. However, such changes should be supported by item-level cost information to avoid reducing customer value or inadvertently shifting demand toward substitutes.

This recommendation is consistent with the movement in contemporary menu research toward more refined cost analysis. (Linassi et al., 2016) shows that combining Menu Engineering with activity-based costing improves the identification of true menu profitability because food cost alone does not capture all resources consumed by individual dishes. Similarly, (Sousa & Calixto, 2025) demonstrates that ingredient yield and cost per portion can materially influence contribution margins, showing that the lowest purchase price does not necessarily generate the most favorable financial outcome. For PePeTeKa Café, this implies that the next level of menu analysis should move beyond a uniform food-cost assumption toward more precise item-level costing wherever operational data permit.

For Puzzles, the objective is different. These products already provide comparatively strong unit contribution margins but generate insufficient demand. Rather than immediately changing prices or removing these items, management can experimentally evaluate modest interventions such as improved menu visibility, staff recommendations, limited promotional exposure, or product bundling and subsequently observe whether sales improve. Such strategies are preferable to assuming that a Puzzle necessarily reflects poor product quality. The customer-driven approach developed by (Nemeschansky et al., 2020) illustrates the value of incorporating customer responses into menu decisions, while (Webb et al., 2025) show that complementary purchase relationships can provide opportunities for bundling and upselling that improve both profitability and customer value.

The broader managerial implication is that Menu Engineering should function as a diagnostic rather than prescriptive tool. A matrix identifies where managerial attention is required, but it does not independently determine the cause of an item's position or guarantee that a particular intervention will improve performance. (Lai & Karim, 2023) demonstrate that simplified menu-management frameworks can be particularly useful for small and micro restaurants because of their accessibility, although their suitability varies according to the type and frequency of managerial decisions. This is highly relevant to PePeTeKa Café, where conventional Menu Engineering offers an attainable starting point for data-driven management without requiring sophisticated analytical infrastructure.

Accordingly, menu performance should be reviewed periodically rather than treated as a one-time classification exercise. Changes in ingredient costs, selling prices, customer preferences, tourism demand, and the composition of the menu can alter both Menu Mix and contribution-margin positions. Integrating Menu Engineering with broader revenue-management practices would therefore enable management to develop from descriptive classification toward continuous performance management progressively (Bujalance-López et al., 2025; Lai et al., 2019).

Economic Sustainability in a Tourism-Oriented Culinary Business

The sustainability implications of the findings should be interpreted primarily through the economic dimension. The present study does not measure environmental outcomes, social impacts, food waste, greenhouse-gas emissions, employee conditions, or community benefits. It therefore cannot establish that Menu Engineering directly produces sustainable tourism outcomes. Instead, the empirical contribution lies in demonstrating how menu-performance information can assist a tourism-oriented culinary business in identifying products that require financial and operational intervention.

This interpretation is supported by recent evidence connecting menu-performance management with restaurant financial sustainability. (Gomes et al., 2025) show that systematic menu analysis can identify highly profitable products and menu items requiring modification, thereby providing managers with practical information to strengthen financial performance. Similarly, (Mashige et al., 2025) demonstrate that menu-performance analysis can inform revenue and cost decisions associated with financially resilient hospitality operations. In this sense, Menu Engineering contributes to economic sustainability indirectly: improved information can support better pricing, cost control, resource allocation, and portfolio decisions, which in turn may strengthen the capacity of a restaurant to sustain its operations over time.

For small tourism-oriented culinary enterprises, this relationship is especially relevant because commercial viability is a prerequisite for continuing participation in the destination economy. A café that systematically identifies high-demand but weak-margin items, recognizes underutilized high-margin products, and adjusts its menu portfolio accordingly is better positioned to manage financial pressure than one relying exclusively on managerial intuition. The PePeTeKa case therefore extends the practical relevance of Menu Engineering beyond menu classification by demonstrating its potential role as an accessible financial diagnostic mechanism for a culinary enterprise operating within a tourism setting.

Nevertheless, economic sustainability should not be conflated with comprehensive sustainability. Contemporary research on professional kitchens demonstrates that environmental sustainability involves additional dimensions such as food-waste reduction, greenhouse-gas mitigation, resource efficiency, managerial competencies, and daily operational practices (Zick et al., 2025). These outcomes were not examined in the present study. Future research could therefore combine menu-performance indicators with measures of ingredient sourcing, food waste, resource utilization, customer value, and local economic linkages to evaluate more comprehensively how menu-management decisions contribute to sustainable culinary tourism.

Overall, the findings support a more restrained but empirically defensible relationship between Menu Engineering and sustainability. Rather than proposing a direct causal relationship, the study suggests the following pathway: menu-performance analysis enables better managerial decisions; better decisions may improve profitability and operational efficiency; and stronger financial viability can support the economic continuity of tourism-oriented culinary enterprises. This positioning maintains the practical relevance of sustainability while remaining consistent with the evidence generated by the study.

Theoretical Contributions

This study contributes to the menu engineering literature in three ways. First, it reinforces the theoretical distinction between menu popularity and menu profitability by showing that strong customer demand does not necessarily correspond with superior unit financial contribution. The substantial proportion of Plowhorse items observed in the case demonstrates why sales volume should not be interpreted as a sufficient indicator of menu performance. This finding supports the continued relevance of the dual-dimensional logic underlying conventional Menu Engineering while also confirming arguments in contemporary restaurant revenue-management literature that menu performance should be evaluated through multiple financial and demand-related indicators (Bujalance-López et al., 2025; Lai et al., 2019, 2020).

Second, the study contributes by positioning conventional Menu Engineering as an accessible first-stage diagnostic framework within a broader continuum of restaurant performance analysis. Contemporary research has progressively extended traditional menu analysis through activity-based costing, multi-factor efficiency models, customer-driven menu analysis, substitution effects, and complementary purchasing behavior (Linassi et al., 2016; Nemeschansky et al., 2020; Noone & Cachia, 2020; Taylor et al., 2009; Webb et al., 2025). Rather than treating these developments as replacements for conventional Menu Engineering, the present study suggests that analytical sophistication can be understood as progressive. In data-constrained small-business settings, popularity and contribution margin can provide an initial diagnostic layer, while more advanced approaches can subsequently incorporate labor, overhead, customer behavior, and transaction-level relationships.

Third, the study refines the conceptual relationship between menu performance and sustainability. Instead of assuming that Menu Engineering directly generates sustainable tourism outcomes, the findings support a more defensible theoretical pathway in which menu-performance information improves managerial decision-making, which may strengthen profitability, cost control, resource allocation, and ultimately the financial viability of the enterprise. This interpretation is consistent with emerging research connecting menu-performance management with restaurant financial sustainability (Gomes et al., 2025) while maintaining a clear distinction between economic viability and broader environmental or social sustainability.

Accordingly, the theoretical contribution of this study does not lie in proposing a new Menu Engineering model, but in repositioning an established framework within contemporary restaurant-performance and sustainability discourse. The study demonstrates that conventional Menu Engineering remains theoretically relevant when its boundaries are explicitly recognized and when its outputs are interpreted as inputs to broader managerial and financial processes. In the context of small tourism-oriented culinary enterprises, this creates a conceptual bridge between menu-level diagnostics and the longer-term economic resilience of hospitality businesses.

Managerial Implications

The findings provide several practical implications for managers of small tourism-oriented cafés and restaurants. First, menu decisions should not rely solely on sales volume. The relatively large proportion of Plowhorse items indicates that frequently purchased products may still provide comparatively weak unit contribution margins. Managers should therefore evaluate menu items through at least two dimensions—demand and financial contribution—before deciding which products should be promoted, retained, repriced, reformulated, or discontinued.

Second, Plowhorse items should be managed primarily through margin improvement rather than demand stimulation. Because these items already demonstrate strong customer acceptance, managerial attention should focus on reviewing portion standards, ingredient specifications, supplier arrangements, recipe consistency, and selling prices. Small improvements in unit margin can generate meaningful financial effects when applied to high-volume products. However, price adjustments should be undertaken cautiously and supported by customer-response monitoring, particularly where substitute products are available within the same menu category.

Third, Puzzle items require a different strategy. Their relatively strong contribution margins indicate financial potential, but their low popularity limits their overall contribution to restaurant performance. Managers can test low-risk interventions such as improved menu visibility, staff recommendations, limited promotional campaigns, bundling, or placement alongside complementary products. These interventions should be treated as controlled managerial experiments and evaluated using subsequent sales data rather than assumed to be effective in advance.

Fourth, Menu Engineering should be implemented as a periodic management routine rather than a one-time analytical exercise. Menu Mix and contribution margins may change as ingredient prices, demand patterns, visitor profiles, and selling prices evolve. A practical monitoring cycle can therefore be established monthly or quarterly, allowing management to identify category shifts and respond before declining margins or weak-selling products become persistent operational problems.

Finally, the café should progressively strengthen the quality of its internal cost data. The current Menu Engineering approach provides a useful first-stage diagnostic, but future managerial analysis would benefit from incorporating item-specific labor, preparation time, waste, and other traceable operating costs. Moving toward more detailed costing would allow management to distinguish between items that appear profitable based on food cost alone and those that generate stronger overall economic returns. For small tourism-oriented culinary enterprises, this gradual transition from intuitive decision-making to structured menu analytics can improve cost control, resource allocation, and financial resilience without requiring complex analytical systems.

CONCLUSION

This study evaluated the menu performance of a tourism-oriented café in Indonesia using twelve months of operational sales data and the conventional Menu Engineering framework. By combining Menu Mix and unit Contribution Margin, the analysis demonstrates that customer demand and financial contribution do not necessarily move in the same direction. The most prominent finding is the substantial presence of Plowhorse items, representing 16 menu items or approximately 41% of the portfolio, alongside five Puzzle items with relatively high margins but lower popularity. These results indicate that frequently purchased products may still provide limited unit financial contribution, while financially attractive items may remain underutilized because of weak demand.

The findings confirm the practical relevance of Menu Engineering as a first-stage diagnostic tool for small culinary businesses. Rather than relying solely on sales volume or managerial intuition, the framework enables managers to identify different menu-performance patterns and prioritize appropriate interventions. For PePeTeKa Café, the results point to the need for margin improvement among high-demand items and demand stimulation for selected high-margin products. However, these classifications should be interpreted within the methodological boundaries of conventional Menu Engineering, which does not account for item-specific labor, overhead costs, customer substitution, or complementary purchasing behavior.

From a broader perspective, this study positions menu-performance analysis as a mechanism that can support the economic viability of tourism-oriented culinary enterprises. Menu Engineering does not directly measure sustainability, but more systematic pricing, cost-control, promotion, and portfolio decisions may strengthen profitability and operational continuity. In this sense, the contribution of Menu Engineering to sustainability is indirect and primarily economic. The study therefore provides empirical support for integrating menu-level performance analysis into broader restaurant management and financial sustainability strategies, particularly in small tourism-related foodservice businesses operating with limited analytical resources.

Limitations and Future Research Directions

This study has several limitations that should be considered when interpreting the findings. First, the analysis is based on a single tourism-oriented café, which limits the generalizability of the results across different restaurant formats, market segments, destination types, and geographic settings. The observed menu structure may reflect the specific characteristics of PePeTeKa Café, including its pricing policy, customer profile, product composition, and location within a tourism destination. Future studies should therefore apply comparable Menu Engineering procedures across multiple cafés, restaurants, and tourism destinations to examine whether similar menu-performance patterns emerge across different operational contexts.

Second, the study applies the conventional Menu Engineering framework, in which profitability is primarily assessed through selling price and Cost of Goods Sold. This approach does not incorporate item-specific labor, preparation time, energy consumption, overhead allocation, or other traceable operating costs. Contemporary studies have shown that incorporating activity-based costing and multi-factor performance measures can provide a more comprehensive assessment of menu profitability (Linassi et al., 2016; Taylor et al., 2009). Future research should therefore integrate conventional Menu Engineering with more detailed cost-accounting approaches to determine whether menu classifications remain stable after broader operating costs are considered. Third, the analysis relies on aggregated operational data and does not capture customer-level purchasing behavior. As a result, the study cannot determine whether menu items function as substitutes or complements, whether high-margin products stimulate additional purchases, or how customers respond to alternative prices and menu placements. Recent menu research demonstrates that substitution effects, complementary purchasing, and customer value can materially alter the interpretation of menu performance (Nemeschansky et al., 2020; Noone & Cachia, 2020; Webb et al., 2025). Future studies could use point-of-sale transaction data, basket analysis, customer surveys, or experimental menu designs to examine these behavioral mechanisms.

Fourth, although the dataset covers twelve months, the present analysis treats menu performance primarily at the aggregate annual level. Such aggregation may obscure seasonal variations, tourism peaks, changes in ingredient prices, and shifts in visitor demand. Future research could employ monthly or quarterly Menu Engineering analysis to identify category transitions over time and determine whether items move between Star, Plowhorse, Puzzle, and Dog positions across different tourism seasons. The study discusses sustainability primarily through the economic and financial viability of the culinary business. Environmental and social sustainability outcomes—such as food waste, energy use, local sourcing, employment effects, community benefits, or carbon emissions—were not directly measured. Future research should therefore extend the framework by integrating menu-performance indicators with environmental and social metrics. Such an approach would enable a more comprehensive assessment of how menu-management decisions contribute not only to restaurant profitability but also to sustainable culinary tourism and destination development.

REFERENCES

Bujalance-López, L., González-Serrano, L., Lechuga Sancho, M. P., & Talon-Ballestero, P. (2025). Restaurant revenue management: a systematic literature review and future challenges. *British Food Journal*, *127*(6), 2169–2196. https://doi.org/10.1108/BFJ-08-2024-0816

Chou, S. F., & Fang, C. Y. (2013). Exploring surplus-based menu analysis in Chinese-style fast food restaurants. *International Journal of Hospitality Management*, *33*(1), 263–272. https://doi.org/10.1016/j.ijhm.2012.08.010

Gomes, C., Malheiros, C., Lima Santos, L., & Campos, F. (2025). Ascertaining Restaurant Financial Sustainability by Analyzing Menu Performance. *Tourism and Hospitality*, *6*(1).

https://doi.org/10.3390/tourhosp6010047
Gopal, S., Gil, M. T., Cydel Salian, B., & Baddaoui, J. (2024). Optimizing digital menus for enhanced purchase intentions: insights from India's restaurant industry in the post-COVID-19 era. *Cogent Business and Management*, *11*(1). https://doi.org/10.1080/23311975.2024.2432536
Kwong, L. Y. L. (2005). The application of menu engineering and design in Asian restaurants. *International Journal of Hospitality Management*, *24*(1), 91–106. https://doi.org/10.1016/j.ijhm.2004.05.002
Lai, H. B. J., & Karim, S. (2023). Do-it-yourself menu management and pricing. *Journal of Revenue and Pricing Management*, *22*(6), 431–445. https://doi.org/10.1057/s41272-023-00419-9
Lai, H. B. J., Karim, S., Krauss, S. E., & Ishak, F. A. C. (2019). Can restaurant revenue management work with menu analysis? *Journal of Revenue and Pricing Management*, *18*(3), 204–212. https://doi.org/10.1057/s41272-019-00194-6
Lai, H. B. J., Karim, S., Krauss, S. E., & Ishak, F. A. C. (2020). A review of approaches to manage menu profitability. *International Journal of Revenue Management*, *11*(3), 151–171. https://doi.org/10.1504/IJRM.2020.109415
Linassi, R., Alberton, A., & Marinho, S. V. (2016). Menu engineering and activity-based costing: An improved method of menu planning. *International Journal of Contemporary Hospitality Management*, *28*(7), 1417–1440. https://doi.org/10.1108/IJCHM-09-2014-0438
Mashige, R., Hewson, D., & Mabaso, C. (2025). The Influence of Cultural Cuisine on Restaurant Revenue: Implications for Financial Sustainability. *African Journal of Hospitality, Tourism and Leisure*, *14*(5), 989–998. https://doi.org/10.46222/ajhtl.19770720.685
Nemeschansky, B., von der Heidt, T., & Kim, P. B. (2020). Customer-driven menu analysis (CDMA): Capturing customer voice in menu management. *International Journal of Hospitality Management*, *91*. https://doi.org/10.1016/j.ijhm.2019.102417
Noone, B. M., & Cachia, G. (2020). Menu engineering re-engineered: Accounting for menu item substitutes in pricing and menu placement decisions. *International Journal of Hospitality Management*, *87*. https://doi.org/10.1016/j.ijhm.2020.102504
Raab, C., Hertzman, J., Mayer, K., & Bell, D. (2007). Activity-based costing menu engineering: A new and more accurate way to maximize profits from your restaurant menu. *Journal of Foodservice Business Research*, *9*(1), 77–96. https://doi.org/10.1300/J369v09n01_06
Raab, C., & Mayer, K. (2007). Menu engineering and activity-based costing - Can they work together in a restaurant? *International Journal of Contemporary Hospitality Management*, *19*(1), 43–52. https://doi.org/10.1108/09596110710724152
Sousa, P. D., & Calixto, F. A. A. (2025). Fresh fish consumption: The impact of fish yield on the financial performance of a fine dining restaurant. *International Journal of Gastronomy and Food Science*, *41*. https://doi.org/10.1016/j.ijgfs.2025.101232
Taylor, J., Reynolds, D., & Brown, D. M. (2009). Multi-factor menu analysis using data envelopment analysis. *International Journal of Contemporary Hospitality Management*, *21*(2), 213–225. https://doi.org/10.1108/09596110910935705
Tom, M., & Annaraud, K. (2021). Fuzzy based intelligent decision support model for restaurant menu management. *Intelligent Decision Technologies*, *15*(3), 387–396. https://doi.org/10.3233/IDT-200162
Webb, T. D., Noone, B., Vajpai, G. N., & Ma, J. (2025). Maximizing restaurant profitability: A complementarity approach. *International Journal of Hospitality Management*, *130*. https://doi.org/10.1016/j.ijhm.2025.104253
Zick, A., Ximena Schmidt, R., & Reynolds, C. (2025). Operationalising sustainability in professional kitchens: The interplay of chef competencies, environmental values and human resource management strategies. *International Journal of Gastronomy and Food Science*, *42*. https://doi.org/10.1016/j.ijgfs.2025.101330