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Comparative nutritional analysis of innovated menu versus standard menu in the Hotel Restaurant

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Abstract
In an era of rising consumer demand for health-conscious cuisine, the hospitality industry faces a persistent challenge such as balancing culinary quality with nutritional value. While culinary innovation is key, a gap exists in holistically evaluating an innovation's simultaneous impact on nutritional content of standard hotel menu offerings. This study focuses on the evaluation of nutritional content of a food product innovation as compared to the standard hotel menu offerings. This study sought to (1) determine the nutritional content of a Standard Menu (SM) versus an Innovated Menu (IM); and (2) compare if a significant difference in nutritional content exists between the two. Employing a descriptive research design, data was gathered via comparative nutritional analysis using food exchange lists authored by American Diabetes Association (ADA). Results revealed that IM was significantly superior on all fronts. The IM demonstrated enhanced nutritional profiles (e.g., increased protein and B-vitamins) compared to the SM. It is recommended that hotel management and culinary professionals adopt these types of strategic innovations, as they are proven to enhance both nutritional value and sensory acceptability, leading to higher customer satisfaction and marketability.

Keywords: Food innovation, hospitality management, nutritional analysis, customer satisfaction

Introduction

The hospitality sector is renowned for providing diverse culinary options that cater to varying dietary requirements and customer preferences. Within this industry, food quality serves as a key determinant of customer satisfaction and competitiveness. As the demand for high-quality, nutritionally balanced cuisine continues to rise, hotels are challenged to maintain consistency in food preparation while ensuring nutritional adequacy and guest satisfaction (Kaushal & Yadav, 2021; Bardukova, 2023) [5, 14]. This study focuses on evaluating food quality in the hospitality industry by examining cooking processes, and nutritional content of innovative menu offerings.

Innovation in hotel food services has become an essential strategy for sustaining competitiveness and meeting evolving consumer expectations. Hrytchuk *et al*. (2020) [11] highlight the importance of innovation in both managerial and operational aspects of hotel and restaurant management. Similarly, Geminarqi and Pumomo (2023) [8] propose outsourcing food and beverage operations in luxury hotels as a strategic innovation to address market challenges. To remain competitive, hotels must adopt new culinary techniques, leverage technological advancements, and foster an innovative culture among their culinary teams. By integrating creativity into menu development, presentation, and customer experience, hotels can differentiate themselves and enhance their market positioning (Gossling & Hall, 2021).

The cooking process is a critical factor in determining both food quality and nutritional value. Hotel food preparation involves a variety of techniques, including ingredient selection, curing, seasoning, and temperature control. Standardized recipes ensure consistency in taste
and presentation, while lean management practices in hotel kitchens can improve efficiency and reduce waste (Permana *et al*., 2023; Kartinawati *et al*., 2022) [13, 18]. However, one of the most vital indicator of food quality, especially in hospitality settings where guests increasingly prioritize health-conscious dining options, is the nutritional content of the served food product menu.

Studies have shown that many hotel meals tend to be high in fats, sodium, and calories while lacking essential vitamins and minerals (Gush *et al*., 2021; Astrup *et al*., 2020) [2, 10]. Martínez-González (2020) [16] observed that calorie-dense menu offerings often contribute to excessive fat and sugar intake, emphasizing the need for hotels to rebalance their menus by incorporating vegetables, whole grains, and nutrient-rich ingredients. Leak *et al*. (2021) [15] further suggested that improving both macronutrient balance and micronutrient density can promote better dietary habits among hotel guests. Thus, evaluating and comparing the nutritional profiles of standard hotel menus with innovated alternatives is crucial for enhancing food healthfulness and meeting customer expectations.

A well-designed and nutritionally balanced menu enhances a hotel's brand image, contributes to higher customer retention, and strengthens its overall marketability (Axala, 2020; Ismail *et al*., 2022) [4, 12]. Given these perspectives, this study aims to evaluate food quality in hospitality by analyzing and comparing the nutrient content of the standard hotel set menu and the innovated set menu. By integrating findings on cooking processes, and nutritional quality, this research provides valuable insights into how innovation in food preparation can enhance the healthfulness and competitiveness of hotel menu offerings.

Research Question

This study sought to answer the following research questions:

1. What is the nutritional content of the standard menu (SM) and innovated menu (IM)? and
2. Is there a significant difference between the two menu preparations in terms of nutritional content?

Research Methodology

1. Research Design

This study employed descriptive research design to evaluate the nutritional content of Standard Menu (SM) and

Innovated Menu (IM). The survey method allowed for a structured comparison between the hotel's standard menu and the innovated product menu, measuring its impact on nutritional content. This design effectively determines whether the innovated product can provide a competitive advantage in the hospitality industry while meeting customer preferences and satisfaction. Table 1 shows the list SM and IM under studied.

Table 1: List of SM and IM

SM	IM
a. Hot Meals	
• Tom Khai Gai Chicken (Soup)-Served with bread and butter • Steamed Rice • Fettuccine Carbonara • Lo Han Chai • Grilled Tuna Belly with Mango and Tomato Salsa • Roast Chicken with Lemon Grass • Slow Cook Roast Beef in Peppercorn Sauce	• Tom Khai Gai Chicken (Soup)-Served with Garlic Croutons • Nasi Goreng • Fettuccine Carbonara with Blended Carrot • Lo Han Chai with rihizomes • Grilled Tuna Belly with Mango and Tomato Salsa with Herbs • Roast Chicken with Lemon Grass side with Green Asparagus • Slow Cook Roast Beef in Peppercorn Cream Sauce
b. Cold Meals	
• Mesclun Salad with Condiments and Dressing	• Mesclun Salad with Condiments and Dressing top with sautéed shrimps
c. Sweets	
• Two kinds of Seasonal Fresh Fruit Slice	• Creamy tropical fruits top with chop pecans
d. Beverage	
• One round of Iced Tea/Juice/Soda	• One round of chilled cucumber/orange with lime zest juice

2. Research Setting

This study was conducted at USTP Culinary Arts Laboratory, a located in Cagayan de Oro, Philippines. The hotel's comprehensive food service operations helped out benchmark the Standard Menu, which include hot meals, cold meals, and sweets, that provide a rich context for examining the various aspects of food preparation, and nutritional content. By focusing on this set hotel, the study aimed to gather detailed and contextually relevant data that can shed light on the broader trends and practices within the hotel industry.

3. Data Gathering Procedure

A written letter of permission was sent to the manager of Limketkai Lux Hotel to asked permission in the used of their compiled menus for a comparative study on Food Nutritional Analysis. Data was gathered through the food exchange lists authored by the American Diabetes Association (ADA, 2020) [1].

4. Ethical Considerations

The researcher adhered to the necessary regulations for issues like human rights, legal compliance, conflict of interest, safety and health standards, and others. Letters of permission was sent to the hotel manager for accepting the intention of making comparative study regarding standard hotel menu.

Results and Discussion

This section presents the results and discussions of the study based on the statement of the problem.

Nutrient content of SM and IM

Table 2: Nutritional Content of Tom Khai Gai Chicken (Soup) Served with Bread and Butter (SM) and Nutritional Content of Tom Khai Gai Chicken (Soup) Topped with Garlic Croutons (IM)

Nutritional Content	Quantity	
	Standard Menu (Original)	Standard Menu (Innovated)
Calories	1,124.17 g	1,202.17 g
Protein	47.1 g	49.1 g
Fat	77.65 g	79.75 g
Carbohydrates	78.9 g	92.1 g
Sodium	2,319 g	2,444 g
Potassium	1,572 g	1,904 g
Calcium	133 g	167 g
Iron	8.5 g	9.4 g
Vitamin D	1 g	1 g
Niacin	19.03 g	20.53 g
Riboflavin	1,129 g	1,228 g
Vitamin B12	1.45 g	1.45 g
Phosphorus	519.5 g	571.5 g
Magnesium	127.8 g	147.8 g
Zinc	5.88 g	6.58 g
Copper	0.885 g	0.945 g
Selenium	63.32 g	64.92 g
Total	6,101.11	6,753.47

Table 2 presents the Nutritional Content of Tom Khai Gai Chicken (Soup) Served with bread and butter. As shown in the table, the innovated menu (IM) delivers more of almost every listed nutrient than the original (SM). Calories, protein, fat, carbohydrates, sodium, potassium, calcium, iron, riboflavin, magnesium, zinc, copper, and selenium are

all higher in IM. Vitamin B12 is unchanged, and Vitamin D appears constant by the table. The summed totals reflect this pattern, with IM exceeding SM (6,763.47 vs 6,101.11 units). Overall, IM is a more energy-dense and micronutrient-dense option than SM.

The results imply that IM can better meet higher energy and nutrient needs but raises sodium and total calories, which may not fit clients with weight, cardiovascular, or renal restrictions. IM suits athletes, labor-intensive events, or clients seeking richer profiles, while SM remains safer for general or restricted diets. Offer both with portion guidance, clear sodium and calorie labeling, and optional modifications (reduced-sodium broth, leaner cuts) to align plates with client health requirements.

Vittayaporn *et al*. (2024) [20] showed that, while maintaining a comparable dietary fiber content, the instant Tom Kha Gai soup with emulsion powder encapsulated with vitamin B1, B2, B12, and folate had significantly higher levels of these nutrients ($p \leq 0.05$) than the instant Tom Kha Gai soup without the emulsion supplements. With a score of "Like Very Much" (7.4±1.1) on the consumer approval test, the instant Tom Kha Gai was deemed to be liked. Additionally, 89% of the customers approved of the product, and 86% said they would buy it if it were on the market. Therefore, the needs of citizens and health-conscious consumers were effectively satisfied by the creation of the nutrient-dense Thai-flavored instant soup.

Table 3 presents the Nutritional Content of Steamed Rice and Nasi Goreng. As shown in the table, the innovated menu is more nutrient-denser than the original across nearly all items raising the total from 4,055.55 to 4,697.91.

Table 3: Nutritional Content of Steamed Rice (SM) and Nasi Goreng (IM). (Per 100g)

Nutritional Content	Quantity	
	Standard Menu (Original)	**Standard Menu (Innovated)**
Calories	346 g	822 g
Protein	25.7 g	38.6 g
Fat	24.14 g	42.24 g
Carbohydrates	5 g	65 g
Sodium	1,335 g	1,455 g
Potassium	351 g	1,091 g
Calcium	266 g	368 g
Iron	2.75 g	6.15 g
Vitamin D	90 g	90 g
Niacin	0.97 g	3.47 g
Riboflavin	0.46 g	1.01 g
Vitamin B12	5.12 g	6.62 g
Phosphorus	404 g	634 g
Magnesium	64.1 g	140.1 g
Zinc	3.51 g	5.51 g
Copper	0.5 g	0.8 g
Selenium	29.7 g	49.3 g
Total	2,953.95 g	4,818.80 g

The result implies that the innovated option can better meet higher energy and micronutrient needs, especially B-vitamins, minerals, calcium, and potassium, but it also increases calories and sodium, so it suits high-expenditure clients while those with weight or sodium limits may prefer the original or a reduced-sodium, smaller-portion version; offer both with portion guidance and a low-sodium modification.

Widowati *et al*. (2024) [21] showed that the nutritional content of steamed rice and nasi goreng was influenced by rice types. Zinc, carbohydrates, and protein can all be preserved through rice cooker cooking. The protein, lipid, and zinc contents of rice cooked in a rice cooker were significantly greater (4.958%, 39.18%, and 21.04 ppm, respectively) than those of rice cooked in a steamer (4.032%, 29.18%, and 15.13 ppm, respectively). In contrast to quick rice, which had GI values of 61, 57, and 52, cooked rice from the Inpari 32, Inpari 45, and Inpari IR Nutri Zinc kinds had GI values of 66, 59, and 55, respectively.

Table 4 reveals the Nutritional Content of Fettuccine Carbonara. The innovated fettuccine carbonara is higher in nearly all nutrients than the original. All increases, while vitamin D remains 90. The total rises from 2,953.95 to 4,818.80, indicating a markedly more energy- and micronutrient-dense dish.

Table 4: Nutritional Content of Fettuccine Carbonara (SM) and Fresh Pasta for Fettuccine Carbonara (IM). (Per 100g)

Nutritional Content	Quantity	
	Standard Menu (Original)	**Standard Menu (Innovated)**
Calories	627 g	737 g
Protein	50.20 g	53.60 g
Fat	23.40 g	25.85 g
Carbohydrates	72.10 g	73.50 g
Sodium	1,680.00 g	1,717.00 g
Potassium	924.00 g	1,177.00 g
Calcium	92.00 g	148.00 g
Iron	3.00 g	4.05 g
Vitamin D	36.00 g	41.00 g
Niacin	11.10 g	18.90 g
Riboflavin	0.30 g	0.80 g
Vitamin B12	0.50 g	1.60 g
Phosphorus	436.00 g	528.00 g
Magnesium	82.00 g	100.00 g
Zinc	1.40 g	3.36 g
Copper	0.25 g	0.55 g
Selenium	52.30 g	67.70 g
Total	4,055.55 g	4,697.91 g

The innovated version better supports higher energy and micronutrient needs but brings substantially more calories, fat, carbohydrates, and sodium, which may not suit clients with weight, lipid, or sodium restrictions. For Karl's Catering Services, position it for high-expenditure events or larger appetites, and keep the original or offer modifications—smaller portions, leaner protein, reduced-cream sauce, and lower-sodium seasoning—for health-conscious or restricted diners.

Fettuccine Carbonara's is typically an energy-dense, fat-rich pasta dish because of its creamy sauce (eggs and cheese) combined with cured pork (pancetta/guanciale or bacon) and butter or oil, which raises both total and saturated fat while providing a moderate amount of protein from the eggs and meat. The final nutrient profile is heavily determined by the recipe choices (amount/type of cured ham, cheese, additional cream, or butter) and portion size. Restaurant or commercial versions likewise exhibit significant variation in sodium and calories (for example, ranging from approximately 350 to 2,200 kcal per serving). Carbonara's salt and saturated fat intake should be carefully considered when interpreting dietary recommendations (Syam, 2023) [19].

Table 5 demonstrates the Nutritional Content of Lo Han Chai. As illustrated, the innovated Lo Han Chai is more nutrient-denser than the original. Calories rise 924→1,020, protein 43.6→49.1, fat 31.3→32.7, carbohydrates 125.2→146.5, and most minerals increase, notably sodium 1,663→3,608, potassium 2,301→3,518, calcium 609→819, iron 12.8→16.5, phosphorus 832→957, and magnesium 358→458. Niacin 15.9→18.6 and riboflavin 1.59→2.51 increase; vitamin D changes slightly 0.03→0.04. Vitamin B12 remains negligible and selenium is unchanged at 4.0. The total rises from 6,930.16 to 10,661.03.

Table 5: Nutritional Content of Lo Han Chai (SM) and Lo Han Chai with Brocoli and Pak Choi (IM). (Per 100g)

Nutritional Content	Quantity	
	Standard Menu (Original)	**Standard Menu (Innovated)**
Calories	924 g	1020 g
Protein	43.6 g	49.1 g
Fat	31.3 g	32.7 g
Carbohydrates	125.2 g	146.5 g
Sodium	1,063.0 g	3,608.0 g
Potassium	2,301.0 g	3,618.0 g
Calcium	609.0 g	819.0 g
Iron	12.3 g	16.5 g
Vitamin D	0.03 g	0.04 g
Niacin	15.9 g	18.6 g
Riboflavin	1.59 g	2.51 g
Vitamin B12	0.0 g	0.0 g
Phosphorus	832.0 g	957.0 g
Magnesium	358.0 g	458.0 g
Zinc	6.9 g	8.7 g
Copper	1.84 g	2.38 g
Selenium	4.0 g	4.0 g
Total	6,930.16 g	10,561.03 g

The innovated version can better meet energy and micronutrient needs but more than doubles sodium and adds calories, which is unsuitable for sodium restricted or weight-control clients. Offer it for high-expenditure contexts and keep the original or a modified option for others. Mitigate risk with portion control and low-sodium adjustments such as reduced sauces, unsalted stocks, and fresh herbs. According to Craig *et al.* (2021) [7], Lo Han Chai is usually a mixed vegetable braise, and its nutritional profile is heavily influenced by how it is made. When made with tofu, seitan/wheat gluten, and nutrient-rich vegetables, it can provide significant amounts of protein, calcium, iron, and potassium, making it relatively micronutrient-dense when compared to plain vegetable soups. However, the energy and macronutrient values differ greatly between home, canned, and restaurant versions (reported recipe/database estimates range from low– moderate calories up to several hundred kcal per serving), as additions like fried gluten, oil, noodles, or starchy thickeners increase the calories and carbohydrates.

Table 6 presents the Nutritional Content of Grilled Tuna Belly with Mango and Tomato Salsa. The innovated grilled tuna belly with mango–tomato salsa is slightly higher in calories and protein with fat essentially unchanged and more carbohydrates. Most micronutrients increase meanwhile, Vitamin D and B12 remain the same, and sodium stays very high with a negligible change. The total sum rises from 8,809.26 to 9,516.77.

Table 6: Nutritional Content of Grilled Tuna Belly with Mango and Tomato Salsa (SM) and Grilled Tuna Belly with Mango, Diced Tomato Salsa with Herbs (IM). (Per 100g)

Nutritional Content	Quantity	
	Standard Menu (Original)	**Standard Menu (Innovated)**
Calories	1,250 g	1,279 g
Protein	32.1 g	35.5 g
Fat	116.8 g	117.4 g
Carbohydrates	49.8 g	55.6 g
Sodium	5,688.0 g	5,694.0 g
Potassium	1,093.5 g	1,392.5 g
Calcium	95.0 g	27.9 g
Iron	4.6 g	8.07 g
Vitamin D	1.0 g	1.0 g
Niacin	13.8 g	14.9 g
Riboflavin	1.11 g	1.33 g
Vitamin B12	16.9 g	16.9 g
Phosphorus	369.0 g	430.0 g
Magnesium	78.0 g	147.0 g
Zinc	1.25 g	2.15 g
Copper	0.4 g	0.52 g
Selenium	38.0 g	41.9 g
Total	8,809.26 g	9,516.77 g

The innovated dish provides better micronutrient coverage and a modest protein and energy boost without adding much fat, but sodium remains extremely high, so it is unsuitable for sodium-restricted diners. Position it as a nutrient-rich seafood entrée for high-expenditure clients, and offer a heart-health variant by reducing brine or marinade salt, using no-salt seasoning, and emphasizing the fresh salsa, pair with portion guidance for general audiences. In addition to providing high-quality protein, long-chain omega-3s (EPA/DHA), vitamin D, B-vitamins (including B12), phosphorus, and selenium, grilled tuna belly with mango-tomato salsa is a nutrient-dense. The fresh mango and tomato in the salsa also add vitamin C, provitamin a carotenoid, potassium, fiber, and polyphenols, which boost the dish's antioxidant and micronutrient content without significantly increasing fat. However, unless low-salt methods (fresh citrus, herbs, low-sodium marinades) are employed, even a nutrient-rich tuna dish may contain excessive sodium because prepared/marinated seafood and restaurant entrées frequently acquire very high sodium from brines, cured ingredients, sauces, or commercial seasonings (Chamorro *et al.*, 2024) [6]

Table 7 presents the Nutritional Content of Slow Cook Roast Beef in Peppercorn Sauce which shows that the innovated slow-cook roast beef is higher on almost every metric. Potassium 2,055→4,059, calcium 412→633, iron 7.92→15.82, vitamin D 130.1→160.1, niacin 10.3→23.6, riboflavin 1.34→2.41, vitamin B12 increases several-fold, phosphorus 548→1,130, magnesium 130.3→233.6, zinc 16.42→27.32, copper 1.36→2.82, selenium 51.7→109.3. Total rises from 8,590.24 to 12,926.45.

Table 7: Nutritional Content of Slow Cook Roast Beef in Peppercorn Sauce (SM) and Slow Cook Roast Beef in Peppercorn Sauce with Rhizomes Vegetables (IM). (Per 100g)

Nutritional Content	Quantity	
	Standard Menu (Original)	Standard Menu (Innovated)
Calories	1,846 g	2,514 g
Protein	35.9 g	89.4 g
Fat	146.9 g	174.0 g
Carbohydrates	79.0 g	132.7 g
Sodium	3,089.5 g	3,409.5 g
Potassium	2,055.0 g	4,059.0 g
Calcium	412.0 g	633.0 g
Iron	7.92 g	15.82 g
Vitamin D	130.1 g	160.1 g
Niacin	10.3 g	27.5 g
Riboflavin	1.34 g	2.41 g
Vitamin B12	28.5 g	149.0 g
Phosphorus	548.0 g	1,130.0 g
Magnesium	130.3 g	233.6 g
Zinc	16.42 g	27.3 g
Copper	1.36 g	2.82 g
Selenium	51.7 g	109.3 g
Total	8,590.24 g	12,926.45 g

The results deliver much more energy, protein, and micronutrients but also more fat and sodium. It suits high-expenditure diners and muscle-recovery needs. For sodium- or fat-restricted clients, retain the original or offer a lean-cut, lighter-sauce, lower-salt variant with portion guidance. Understanding the function of beef in healthy dietary patterns requires nutrient composition statistics that appropriately reflect the variety of beef products available.

As USDA Prime beef cuts become more accessible, new nutritional data are necessary since the quality of beef products has altered over the past few decades. Five USDA Prime cuts—rib roast, strip loin steak, tenderloin steak, ribeye steak, top sirloin steak, and tenderloin steak—were gathered from retail establishments in six different locations over the course of three collections for macro- and micronutrient analysis in both the raw and cooked states in an attempt to provide a comprehensive nutrient profile for commonly purchased USDA Prime beef cuts. Of all the USDA Prime cuts examined, the separable lean fraction was deemed a good or outstanding source, contributing 10–19%. The current study provides the most up-to-date nutrient analysis for USDA Prime beef cuts, helping consumers and health professionals better identify the role of high-quality beef cuts in healthy dietary patterns (Mortensen *et al*., 2024) [17].

Table 8 shows the Nutritional Content of Roast Chicken with Lemon Grass. The innovated roast chicken with lemongrass shows moderate increases: calories 2,479→2,679, protein 56.9→58, fat 190→204.4, carbohydrates 167.8→184.8, sodium 851→1,033. Minerals and B-vitamins edge up: potassium 3,107→3,437, calcium 449→471, iron 20.8→21.9, niacin 16.5→17.9, riboflavin 0.65→0.75, phosphorus 593→613, magnesium 208→216, zinc 4.8→5.1, copper 1.45→1.5; vitamin D and B12 are unchanged; selenium is stable. Total increases from 8,196.3 to 8,993.75.

Table 8: Nutritional Content of Roast Chicken with Lemon Grass (SM) and Roast Chicken with Lemon Grass & Green Asparagus (IM). (Per 100g)

Nutritional Content	Quantity	
	Standard Menu (Original)	Standard Menu (Innovated)
Calories	2,479 g	2,679 g
Protein	56.9 g	58.0 g
Fat	190.0 g	20.44 g
Carbohydrates	107.8 g	184.8 g
Sodium	851.0 g	1,033.0 g
Potassium	3,107.0 g	3,497.0 g
Calcium	449.0 g	471.0 g
Iron	20.8 g	21.9 g
Vitamin D	1.2 g	1.2 g
Niacin	16.5 g	17.9 g
Riboflavin	0.65 g	0.75 g
Vitamin B12	0.5 g	0.5 g
Phosphorus	593.0 g	913.0 g
Magnesium	208.0 g	216.0 g
Zinc	4.8 g	5.1 g
Copper	1.45 g	1.5 g
Selenium	48.7 g	48.7 g
Total	8,196.30 g	8,993.76 g

Nutrient density improves slightly without dramatic increases in fat or sodium. This option is broadly suitable for general audiences. According to Awodoyin (2025) [3], processed chicken meat products are more prone to oxidative deterioration, which lowers the product's quality and safety. For this reason, it is necessary to include antioxidants during the processing order to delay its processes. Lemongrass (Cymbopogon citratus), which is commonly used as a marinade or herb for roast chicken in Southeast Asian cuisine, contributes very little in the way of macronutrients at culinary dosages but provides bioactive compounds (citral, flavonoids, terpenoids) with antioxidant, anti-inflammatory, and antimicrobial qualities that can extend shelf life and possibly lower microbial load when used in marinades. Utilization of different levels of lemongrass leaf powder in chicken meat balls production increased nutrition and improved the lipid oxidation stability of the product during refrigerated storage.

Significant difference between the two menu preparations in terms of Nutritional Content

Table 12 shows the Significant Difference of the Nutritional Content of Tom Khai Gai Chicken (Soup) Served with bread and butter. The innovated Tom Khai Gai adds nutrients almost across the board: calories +78, protein +2, fat +2.20, carbohydrates +12.3, sodium +125, potassium +332, calcium +34, iron +0.9, niacin +1.5, riboflavin +0.10, phosphorus +52, magnesium +20, zinc +0.59, copper +0.06, selenium +1.60; vitamin D and B12 show no practical change. Net increase ≈+664.81 units. The soup becomes more energy-dense and micronutrient-dense but raises sodium and carbs. Use for higher energy needs; offer a reduced-sodium broth or smaller portion for salt- or calorie-limited diners.

Table 9: Significant Difference of Tom Khai Gai Chicken (Soup) Served with Bread and Butter (SM) and Tom Khai Gai Chicken (Soup) Topped with Garlic Croutons (IM). (per 100g)

Nutritional Content	Quantity		Differences
	Standard Menu Original	Standard Menu Innovated	
Calories	1,124 g	1,202 g	78 g
Protein	47.10 g	49.10 g	2.00 g
Fat	77.56 g	79.75 g	2.20 g
Carbohydrates	79.80 g	92.10 g	12.30 g
Sodium	2,319.00 g	2,444.00 g	125.00 g
Potassium	1,572.00 g	1,904.00 g	332.00 g
Calcium	133.00 g	167.00 g	34.00 g
Iron	8.50 g	9.40 g	0.90 g
Vitamin D	1.00 g	1.00 g	1.00 g
Niacin	19.03 g	20.59 g	1.50 g
Riboflavin	1.128 g	1.228 g	0.100 g
Vitamin B12	1.45 g	1.45 g	1.45 g
Phosphorus	519.50 g	571.50 g	53.00 g
Magnesium	127.80 g	147.80 g	20.00 g
Zinc	5.88 g	6.58 g	0.70 g
Copper	0.885 g	0.945 g	0.00 g
Selenium	63.32 g	64.93 g	1.60 g
Total	6,101.11 g	6,763.47 g	664.81 g

Table 13 illustrates the Significant Difference of the Nutritional Content of Steamed Rice and Nasi Goreng. guidance for weight or sodium control. The innovated steamed rice/Nasi Goreng is higher on nearly all metrics: calories +110, protein +3.4, fat +2.45, carbohydrates +1.4, sodium +37, potassium +253, calcium +56, iron +1.05, vitamin D +5, niacin +7.8, riboflavin +0.5, vitamin B12 +1.1, phosphorus +92, magnesium +18, zinc +1.96, copper +0.3, selenium +15.4. Total gain ≈+606.81. More nutrients and energy come with extra sodium and carbohydrate. Fit for higher expenditure meals; keep a lighter, lower-sodium version and portion guidance for weight or sodium control.

Table 10: Significant Difference of Steamed Rice (SM) and Nasi Goreng (IM). (Per 100g)

Nutritional Content	Quantity		Differences
	Standard Menu Original	Standard Menu Innovated	
Calories	346 g	822 g	476 g
Protein	25.7 g	38.6 g	12.9 g
Fat	24.14 g	42.24 g	18.1 g
Carbohydrates	5 g	65 g	60 g
Sodium	1,335 g	1,455 g	120 g
Potassium	351 g	1,091 g	740 g
Calcium	266 g	368 g	102 g
Iron	2.75 g	6.15 g	3.4 g
Vitamin D	90 g	90 g	19 g
Niacin	0.97 g	3.47 g	2.5 g
Riboflavin	0.46 g	1.01 g	0.55 g
Vitamin B12	5.12 g	6.62 g	1.5 g
Phosphorus	404 g	634 g	230 g
Magnesium	64.1 g	140.1 g	76 g
Zinc	3.51 g	5.51 g	2.0 g
Copper	0.5g	0.8 g	0.3 g
Selenium	29.7g	49.3 g	19.6 g
Total	2953.95	4818.8	1865.85

Table 11. presents the Significant Difference of the Nutritional Content of Fettuccine Carbonara.

Table 11: Significant Difference of Fettuccine Carbonara (SM) and Fresh Pasta for Fettuccine Carbonara (IM). (Per 100g)

Nutritional Content	Quantity		Differences
	Standard Menu Original	Standard Menu Innovated	
Calories	627 g	737 g	110 g
Protein	50.20 g	53.60 g	3.40 g
Fat	23.40 g	25.85 g	2.45 g
Carbohydrates	72.10 g	73.50 g	1.40 g
Sodium	1,680.00 g	1,717.00 g	37.00 g
Potassium	924.00 g	1,177.00 g	253.00 g
Calcium	92.00 g	148.00 g	56.00 g
Iron	3.00 g	4.05 g	1.05 g
Vitamin D	36.00 g	41.00 g	5.00 g
Niacin	11.10 g	18.90 g	7.80 g
Riboflavin	0.30 g	0.80 g	0.50 g
Vitamin B12	0.50 g	1.60 g	1.10 g
Phosphorus	436.00 g	528.00 g	92.00 g
Magnesium	82.00 g	100.00 g	18.00 g
Zinc	1.40 g	3.36 g	1.96 g
Copper	0.25 g	0.55 g	0.30 g
Selenium	52.30 g	67.70 g	15.40 g
Total	4,055.55	4,697.91	606.81

Innovated fettuccine carbonara shows large increases: calories +476, protein +12.9, fat +18.1, carbohydrates +60, sodium +120, potassium +740, calcium +102, iron +3.4, niacin +2.5, riboflavin +0.55, B12 +1.5, phosphorus +230, magnesium +76, zinc +2.0, copper +0.3, selenium +19.6. Total gain ≈+1,865.85. The dish becomes much richer in energy, fat, and sodium along with strong micronutrient

gains. Position for hearty appetites; provide leaner sauce, less cheese, and smaller portions for calorie or salt limits.

Table 15 presents the Significant Difference of the Nutritional Content of Lo Han Chai. Innovated Lo Han Chai increases calories +96, protein +5.5, fat +1.4, carbohydrates +21.3, and especially minerals: sodium +1,945, potassium +1,217, calcium +210, iron +3.7, phosphorus +125, magnesium +100, zinc +2.0, copper +0.54; vitamins change marginally, B12 remains 0. Total rise ≈+3,734.87. Strong micronutrient boost comes with a very large sodium increase. Suitable for high-expenditure needs only if sodium is managed; offer low-salt stocks and sauces or default to the original for salt-restricted clients.

Table 12: Significant Difference of Lo Han Chai (SM) and Lo Han Chai with Brocoli and Pak Choi (IM). (Per 100g)

Nutritional Content	Quantity		Differences
	Standard Menu Original	Standard Menu Innovated	
Calories	924 g	1,020 g	96 g
Protein	43.6 g	49.1 g	5.5 g
Fat	31.3 g	32.7 g	1.4 g
Carbohydrates	125.2 g	146.5 g	21.3 g
Sodium	1,663 g	3,608 g	1,945 g
Potassium	2,301 g	3,518 g	1,217 g
Calcium	609 g	819 g	210 g
Iron	12.8 g	16.5 g	3.7 g
Vitamin D	0.03 g	0.04 g	0.01 g
Niacin	15.9 g	18.6 g	2.7 g
Riboflavin	1.59 g	2.51 g	0.92 g
Vitamin B12	0 g	0 g	0 g
Phosphorus	832 g	957 g	125 g
Magnesium	358 g	458 g	100 g
Zinc	6.9 g	8.7 g	1.8 g
Copper	1.84 g	2.38 g	0.54 g
Selenium	4.0 g	4.0 g	4.0 g
Total	6,930.16	10,661.03	3,734.87

Table 13 shows the Significant Difference of the Nutritional Content of Grilled Tuna Belly with Mango and Tomato Salsa.

Innovated grilled tuna belly shows moderate improvements: calories +29, protein +3.4, fat +0.6, carbohydrates +5.8, sodium +6 (still very high), potassium +339, calcium +184, iron +3.47, niacin +1.1, riboflavin +0.22, phosphorus +61, magnesium +69, zinc +0.9, copper +0.12, selenium +3.9; vitamins D and B12 unchanged. Total increase ≈+725.41. Better mineral and protein profile with minimal extra fat, but sodium remains excessive. Keep as a nutrient-dense seafood entrée and provide a heart-health variant by reducing marinade salt and seasoning; add portion guidance.

Table 13: Significant Difference of Grilled Tuna Belly with Mango and Tomato Salsa (SM) and Grilled Tuna Belly with Mango, diced Tomato and Salsa and with Herbs (IM)

Nutritional Content	Quantity		Differences
	Standard Menu Original	Standard Menu Innovated	
Calories	1,250 g	1,279 g	29 g
Protein	32.1 g	35.5 g	3.4 g
Fat	116.8 g	117.4 g	0.6 g
Carbohydrates	49.8 g	55.6 g	5.8 g
Sodium	5,688 g	5,694 g	6 g
Potassium	1,053.5 g	1,392.5 g	339 g
Calcium	95 g	279 g	184 g
Iron	4.6 g	8.07 g	3.47 g
Vitamin D	1 g	1 g	1 g
Niacin	13.8 g	14.9 g	1.1 g
Riboflavin	1.11 g	1.33 g	0.22 g
Vitamin B12	16.9 g	16.9 g	16.9 g
Phosphorus	369 g	430 g	61 g
Magnesium	78 g	147 g	69 g
Zinc	1.25 g	2.15 g	0.9 g
Copper	0.4 g	0.52 g	0.12 g
Selenium	38 g	41.9 g	3.9 g
Total	8,809.26	9,516.77	725.41

Table 14 shows the Significant Difference of the Nutritional Content of Nutritional Content of Slow Cook Roast Beef in Peppercorn Sauce.

Table 14: Significant Difference of Slow Cook Roast Beef in Peppercorn Sauce (SM) and Slow Cook Roast Beef in Peppercorn Sauce with Rhizomes Vegetables (IM). (Per 100g)

Nutritional Content	Quantity		Differences
	Standard Menu Original	Standard Menu Innovated	
Calories	1,846 g	2,514 g	668.0 g
Protein	35.9 g	89.4 g	53.5 g
Fat	146.9 g	174 g	27.1 g
Carbohydrates	79 g	132.7 g	53.7 g
Sodium	3,089.5 g	3,466.5 g	377.0 g
Potassium	2,055 g	4,059 g	2,004.0 g
Calcium	412 g	633 g	221.0 g
Iron	7.92 g	15.82 g	7.90 g
Vitamin D	130.1 g	160.1 g	30.0 g
Niacin	10.3 g	27.5 g	17.2 g
Riboflavin	1.34 g	2.41 g	1.07 g
Vitamin B12	28.5 g	149 g	120.5 g
Phosphorus	548 g	1,130 g	582.0 g
Magnesium	130.3 g	233.6 g	103.3 g
Zinc	16.42 g	27.3 g	10.88 g
Copper	1.36 g	2.82 g	1.46 g
Selenium	51.7 g	109.3 g	57.6 g
Total	8,590.24	12,926.45	4,336.21

The innovated slowcook roast beef gains sharply across metrics: calories +668, protein +53.5, fat +27.1, carbs +53.7, sodium +377, and large mineral/vitamin jumps, notably potassium +2,004, calcium +221, iron +7.9, vitamin D +30, niacin +17.2, B12 +120.5, phosphorus +582, magnesium +103, zinc +10.6, copper +1.46, selenium +57.6; total +4,336.21. The results suit high energy and protein needs but raises fat and sodium. Offer to athletes or heavy-work events, and keep a lean, lower-sodium option and portion guidance for restricted diners.

Table 15 presents the Significant Difference of the Nutritional Content of Roast Chicken with Lemon Grass. The innovated roast chicken shows moderate increases: calories +200, protein +1.1, fat +14.4, carbs +17, sodium +182, potassium +330, calcium +22, iron +1.1, niacin +1.4, riboflavin +0.10, phosphorus +20, magnesium +8, zinc +0.3, copper +0.05; vitamins D, B12, selenium unchanged; total +799.15. Moreover, the results imply that Nutrient density improves without extreme sodium or fat growth. Suitable for general service; provide lighter seasoning for low sodium needs.

Table 15: Significant Difference of Roast Chicken with Lemon Grass (SM) and Roast Chicken with Lemon Grass & Green Asparagus (IM). (Per 100g)

Nutritional Content	Quantity		Differences
	Standard Menu Original	Standard Menu Innovated	
Calories	2,479 g	2,679 g	200 g
Protein	56.9 g	58 g	1.1 g
Fat	190 g	204.4 g	14.4 g
Carbohydrates	167.8 g	184.8 g	17.0 g
Sodium	851 g	1,033 g	182 g
Potassium	3,107 g	3,437 g	330 g
Calcium	449 g	471 g	22 g
Iron	20.8 g	21.9 g	1.1 g
Vitamin D	1.2 g	1.2 g	1.2 g
Niacin	16.5 g	17.9 g	1.4 g
Riboflavin	0.65 g	0.75 g	0.10 g
Vitamin B12	0.5 g	0.5 g	0.5 g
Phosphorus	593 g	613 g	20 g
Magnesium	208 g	216 g	8 g
Zinc	4.8 g	5.1 g	0.3 g
Copper	1.45 g	1.5 g	0.05 g
Selenium	48.7 g	48.7 g	0 g
Total	8,196.30	8,993.75	799.15

Conclusion

Based on the results, the findings showed a consistent pattern: the innovated menus (IM) provided higher nutrient density and greater consumer acceptability compared to the standard menus (SM). Nutritional analysis revealed that the innovated dishes significantly improved energy, protein, and micronutrient content, though often at the expense of higher fat, sodium, and carbohydrate values. While these positions IM as suitable for clients with high energy expenditure such as athletes or labor-intensive events, it also highlights the importance of portion control and low-sodium alternatives for health conscious or restricted diners. These results suggest that the innovated menu offerings can strategically offer both versions such as innovated for nutrient and flavor enrichment, and original for lighter, health-conscious needs thereby broadening appeal and aligning with diverse client dietary profiles.

Recommendation

Based on the findings the following recommendations are presented.

Offer Dual Menu Options. Retain both the Standard Menu Original (SM) and the Standard Menu Innovated (IM). This allows clients with high energy needs to enjoy nutrient-rich innovative dishes while those with dietary restrictions can choose the lighter originals.

Develop Reduced-Sodium and Low-Fat Variants. Since many innovated dishes significantly increased sodium and fat levels, catering services should formulate low-salt broths, leaner cuts, lighter dressings, or reduced-cream sauces. This will expand the suitability of innovative menus for diners with cardiovascular or metabolic concerns.

Positioning of Innovated Dishes. Promote innovative dishes as premium options for athletes, physically active individuals, and special events where higher nutrient density is desirable. The standard menu can remain the baseline for everyday or general catering needs.

Incorporate regular customer satisfaction surveys focusing on taste, texture, aroma, and appearance. Continuous feedback will help refine recipes and maintain consumer approval over time.

Future research should assess the economic feasibility of innovated menus by comparing ingredient costs, preparation time, and customer willingness to pay.

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