

Review

Public health perspectives on out-of-home food consumption in Thailand

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Out-of-home food consumption in Thailand has risen markedly in recent decades, driven by urbanization, changing family structures, increased participation of women in the labour force, and expansion of digital food delivery platforms. This shift reflects broader transformations in the national food environment, in which convenience, accessibility, and cultural norms strongly influence dietary behaviours. Although eating outside the home is deeply embedded in Thai social life and contributes significantly to both informal and formal economies, meals prepared away from home are frequently energy-dense and nutritionally imbalanced. Evidence from national surveys and empirical studies consistently links frequent consumption of street food, restaurant meals, and delivery items with poorer dietary quality and an elevated risk of non-communicable diseases. In response, the Thai government has implemented multiple strategies to improve nutritional standards and consumer awareness. However, enforcement challenges, especially within the informal street food sector, and limited public understanding of nutrition hinder progress. Opportunities exist to strengthen the food environment through recipe reformulation, expanded menu labelling, vendor training, healthier cooking practices, and integration of digital nutrition tools. As Thailand's food landscape evolves, culturally responsive and multisectoral strategies will be essential to promote healthier out-of-home eating. Enhancing the nutritional quality, safety, and transparency of meals consumed outside the home will be critical to advancing national public health objectives and mitigating the growing burden of diet-related diseases.

Key Words: eating out, meals away from home, food environment, dietary, public health

TRENDS IN CONSUMING MEALS AWAY FROM HOME IN THAILAND

The increasing consumption of meals prepared and consumed outside home in Thailand represents a complex socio-cultural and economic transformation. This phenomenon, often referred to as public eating, is increasingly characteristic of urban lifestyles, particularly in major metropolitan areas such as Bangkok.¹ Although frequently attributed to shifts in individual preferences, this behavioural trend reflects broader systemic transitions in Thailand's food environment. Several interrelated factors underpin this transition, including the growth of gastro-nomic tourism, the influence of Western dietary practices, and demographic changes such as the rise in single-person households, increased women participation in the labour force, and a shift from extended to nuclear family structures.¹⁻⁴ These structural dynamics have led to heightened demand for convenience in food acquisition, prompting urban populations to rely more heavily on street food vendors, commercial eateries, and digital food delivery services.³

The COVID-19 pandemic further intensified this shift by accelerating the integration of digital technologies into food procurement. Online food delivery (OFD) platforms have become a fundamental component of urban food systems.⁵⁻⁷ Comparative data from pre- and post-

pandemic periods underscore a significant evolution in out-of-home consumption patterns. Prior to the pandemic, 43.5% of surveyed individuals reported dining out on weekends, with 43.3% doing so on a monthly basis. Preferred food choices included fast food, made-to-order meals, and chain restaurants, with 31% dining out with family members. Post-pandemic, there was a notable increase in dining out during public holidays (56.5%) and a rise in overall dining frequency (64.8%). Additionally, dining out with family increased to 40.3%, though 60.8% of respondents also indicated avoiding dining out altogether.⁸

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Additional insights are provided by the 2021 Health Behavior of Population Survey conducted by the National Statistical Office of Thailand (Figures 1 and 2). Among individuals aged six and above, 76.9% reported home-cooked meals as their primary food source. This was followed by meals from made-to-order restaurants (12.8%), flea markets (8.1%), and street vendors (1.4%). Only 0.8% sourced their main meals from other outlets such as convenience stores, fast food restaurants, and supermarkets. Regional variation was also evident: the northern (87.9%), southern (87.2%), and northeastern (84.8%) regions demonstrated the highest reliance on home cooking, while the central region reported 68.3%, and Bangkok had the lowest proportion at 56.1%.⁹

For selecting food, key decision-making factors included personal preference (22.5%), cravings (21.1%), taste (18.7%), and hygiene (16.4%). Notably, hygiene was the most frequently cited consideration among Bangkok respondents (25.8%), while personal preference dominated in the central, northern, and southern regions. Cravings were the leading determinant in the northeast (25.8%).⁹

Demographic-specific research highlights further complexities in eating-out behaviours. Among Generation Y in Bangkok, the average number of meals consumed outside the home was 2.64 per day. A significant portion ate alone (46.2%), followed by those eating with a partner (20.4%), friends (19.3%), and family (11.8%). Street food was the most common source (52.8%), with commercial restaurants and convenience stores also playing a major role. Influencing factors included digital media exposure, time constraints, the relative cost of home cooking, and the convenience of food delivery. Regression analyses indicated that time spent outside the home, family eating habits, media consumption, income, and meal frequency significantly predicted eating-out behaviour, collectively

accounting for 81.6% of the variance. Time use was identified as the strongest predictor ($\beta = 0.51$).¹⁰

A cross-sectional study involving 736 individuals (274 men, 462 women) provided further empirical evidence of street food consumption behaviour. Students comprised the largest consumer group (33.5%), and approximately 40% of participants were classified as overweight or obese. Primary food selection criteria included visual appeal, flavour, hygiene, portion size, cost, and nutritional content. Over 90% of participants emphasised the importance of service quality, vendor demeanour, and accessibility. Digital media significantly influenced food choices, with 75% reporting that online reviews impacted their decisions. Consumption patterns were notably frequent: 30.8% consumed street food four to six times weekly, 26.9% daily, and 24.9% two to three times per week, primarily during dinner. Grilled, made-to-order, and boiled dishes were most commonly consumed. Most purchases were made individually (71.6%), with convenience (83.2%) and affordability (39.4%) cited as the primary motivations.¹¹

Psychographic segmentation research offers further insight into consumer typologies within Bangkok. Consumers were classified into seven distinct groups: economically conscious, home-oriented, fashion-oriented and outgoing, family-oriented, health-conscious and active, socially conscious, and independent. Variations in eating-out behaviour were significantly associated with educational attainment, lifestyle orientation, and the frequency of convenience food consumption. While Thai cuisine and local neighbourhood restaurants remained preferred, individuals with higher educational backgrounds reported more frequent dining out. Interestingly, those who avoided canned foods were also more likely to eat out, suggesting a complex relationship between dietary health

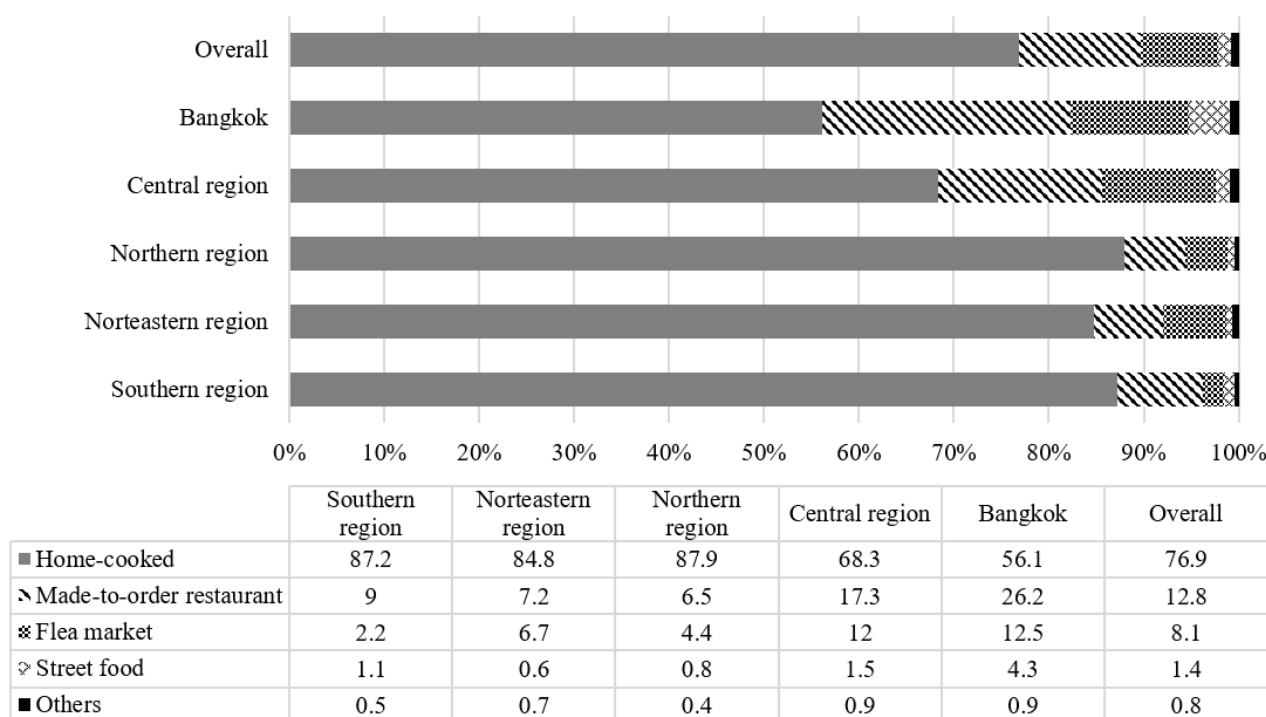


Figure 1. Percentage of the Thai population aged over 6 years by primary food source most frequently consumed and region, based on data from the 2021 Health Behavior Survey conducted by the National Statistical Office of Thailand.⁹

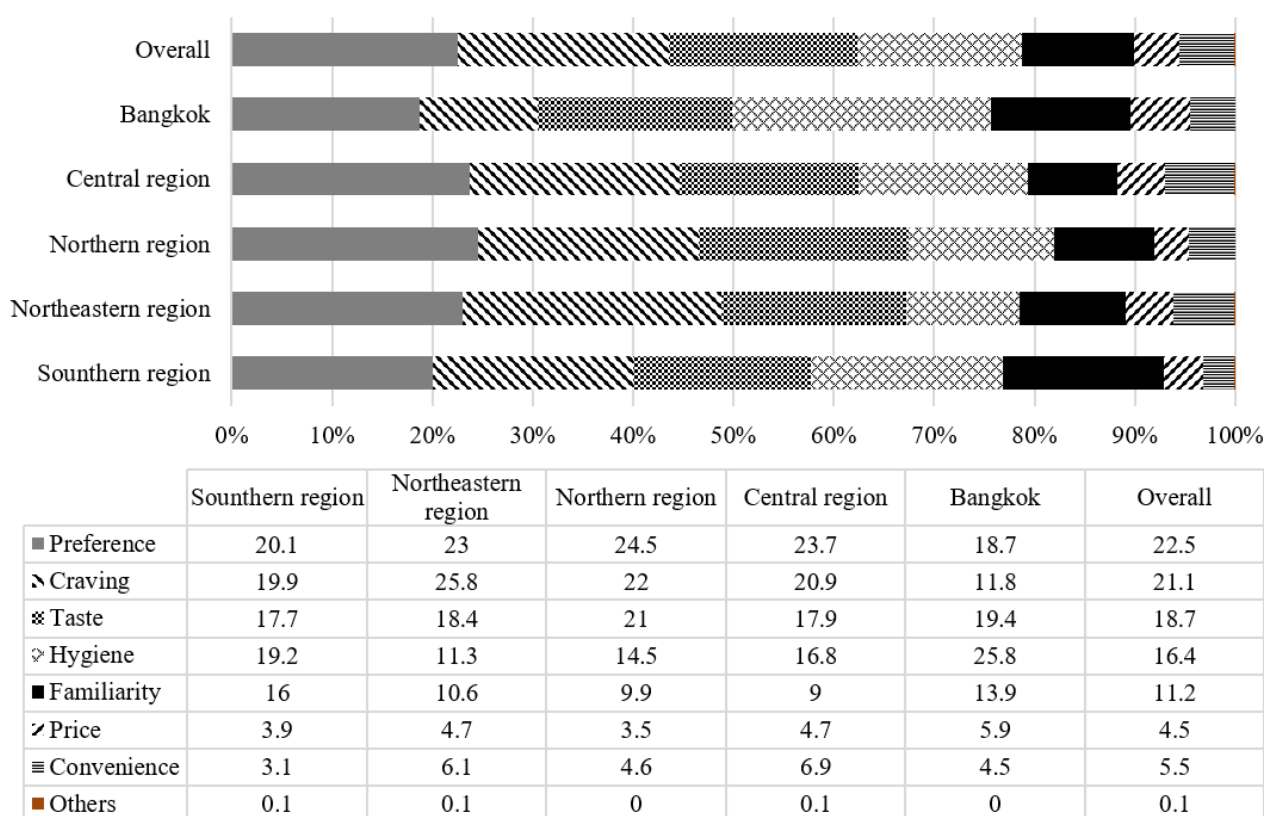


Figure 2. Percentage of the Thai population aged over 6 years by factors considered when purchasing food and region, based on data from the 2021 Health Behavior Survey conducted by the National Statistical Office of Thailand.⁹

consciousness and food purchasing behaviour.¹²

Collectively, these findings underscore the increasingly complex and evolving nature of Thailand's food landscape. Urbanisation, economic growth, and digital innovation have contributed to a marked nutritional transition characterized by increased reliance on energy-dense, convenience-oriented foods.^{13,14} The proliferation of commercial food establishments, digital delivery platforms, and the incorporation of regional cuisines into urban dietary patterns reflect a broader shift toward individualization and commercialization in food consumption. Nevertheless, traditional street food continues to play a central role in everyday sustenance and remains a cornerstone of Thailand's cultural identity and global culinary reputation.^{1,15}

FOOD CULTURE TRANSFORMATION IN THAILAND THROUGH EATING-OUT PRACTICES

The culture of eating out in Thailand extends well beyond the fulfilment of nutritional requirements. It plays a critical role in shaping daily social interactions and influencing patterns of urban development. The widespread normalization of dining at street stalls, night markets, and modern shopping malls is driven by a confluence of deeply embedded cultural values and evolving structural conditions.^{1,16,17}

From an economic perspective, eating out in Thailand is highly accessible, primarily due to the affordability and omnipresence of street food vendors. For many, particularly within the working class, street food represents a practical and routine dietary solution.¹⁸ The relatively low

cost of ingredients, coupled with reliance on an expansive informal labour network, enables vendors to provide meals at minimal prices. This has facilitated the proliferation of small-scale, family-operated enterprises that not only sustain the livelihoods of millions but also form a critical component of the country's informal economy. Public dining, especially in urban areas, remains integral to Thai social life, with street food deeply embedded in everyday cultural practices and supported by a robust informal sector that preserves its accessibility and affordability.^{1,18}

Concurrently, the eating-out industry contributes substantially to the formal economy, particularly in metropolitan areas such as Bangkok.^{19,20} The expansion of food tourism has amplified the global appeal of Thai cuisine, encouraging the growth of upscale dining establishments, curated culinary experiences, and internationally acclaimed restaurants. This dual economy, consisting of the informal, everyday street food sector and the formal, high-end restaurant scene, demonstrates the diversity and adaptability of Thailand's food service landscape.

Culturally, food occupies a central and multifaceted position within Thai society. Communal meals are customary and strengthen familial and communal ties. Beyond physical sustenance, dining functions as a vehicle for hospitality, cultural expression, and social cohesion. The widespread practice of sharing multiple dishes with rice symbolizes the societal values of inclusivity and cooperation. Furthermore, Thai food traditions are intimately connected with religious and spiritual customs.²¹ Street food plays an essential role in sustaining these traditions

by facilitating the continuation of customary eating habits. In Bangkok, the physical structure of street spaces supports the livelihoods of urban migrants and constitutes an indispensable element of everyday life.²² The growing popularity of Isaan, or northeastern, cuisine in the capital reflects increased appreciation of northeastern Thailand's bold, rustic culinary traditions and their incorporation into a shared national identity. However, these culinary traditions are frequently modified to align with the preferences and norms of contemporary society, as their distinctive flavors and local ingredients may not be widely accepted, thereby contributing to a gradual weakening of ethnic identity in local cuisines.²³ Additionally, culinary landscapes in riverside cities near Bangkok present promising opportunities for gastronomic tourism. However, the limited visibility of local cuisines in these areas suggests substantial room for both cultural and economic development.²⁴

In recent years, Thailand's food environment has undergone marked transformation due to globalisation, technological advancement, and shifting consumer preferences. The rapid proliferation of food delivery platforms has redefined the notion of eating out, offering consumers the convenience of restaurant-quality meals at home. This trend, accelerated by the COVID-19 pandemic, has spurred innovation in food logistics and e-commerce.^{5,6} Simultaneously, there has been growing interest, particularly among younger and middle-class urban populations, in health-conscious and environmentally sustainable diets. This has contributed to the rise of organic, plant-based, and fusion food options, with many establishments catering to ethical consumption, dietary preferences, and wellness-oriented lifestyles. The blending of Thai cuisine with global culinary influences, exemplified by Thai-Western fusion restaurants, artisanal cafés, and international food chains, illustrates an ongoing process of culinary hybridisation. While some critics express concern that such trends may dilute traditional food identities, others interpret this phenomenon as a dynamic form of cultural exchange and innovation.

In conclusion, Thailand's eating-out environment reflects the complex intersections of tradition and modernity, informality and formality, and local specificity with global interconnectedness. It offers a compelling lens through which to examine broader socio-economic and cultural transformations. As Thailand continues to urbanise and integrate into the global economy, the evolution of its food culture, particularly the patterns associated with eating out, will remain a significant indicator of changing societal values, lifestyles, and behaviours.

NUTRITIONAL COMPOSITION OF MEALS AWAY FROM HOME

Empirical evidence consistently indicates that meals consumed outside the home in Thailand are frequently energy-dense but nutritionally inadequate. These meals are typically characterised by elevated levels of saturated fat, sodium, and refined carbohydrates, while lacking sufficient dietary fibre, fruits, and vegetables.^{25,26} Popular street and restaurant dishes (such as fried rice, pad thai, grilled pork with sticky rice, and various curries) often exceed recommended per-serving limits for caloric intake

and lack sufficient vegetables. This nutritional imbalance is exacerbated by the widespread use of seasonings, fish sauce, soy sauce, salt, coconut milk, and sugar, all of which contribute to excessive consumption of sodium, fat, and added sugar. In addition to macronutrient imbalances, micronutrient deficiencies are prevalent in out-of-home meals, particularly among vulnerable populations such as low-income groups and adolescents. These deficiencies are largely attributable to the limited inclusion of fresh vegetables and fruits in both street food and restaurant offerings. Cooking practices such as deep-frying and prolonged boiling further deplete nutrients in vegetables and protein sources, thereby diminishing overall dietary quality.

Recent trends show that meals ordered through OFD platforms are generally less nutritious than home-cooked meals. OFD offerings are frequently high in sodium, sugar, and unhealthy fats, raising concerns about the increasing incidence of obesity and diet-related non-communicable diseases. A 2023 study examining 600 popular menu items from OFD platforms in Bangkok found that 23 of the 25 most common ready-to-eat dishes exceeded the World Health Organization's recommended daily sodium intake for adults. Similarly, sweet menu items contained approximately 1.5 times the advised daily sugar limit, underscoring a significant risk of overconsumption.²⁵

A 2018 study conducted by the Nutrition Association of Thailand and the Health Promotion Foundation analysed 50 street food samples from Bangkok and compared their nutritional profiles with the Thai Recommended Daily Intakes (Thai RDIs) for individuals six or more years of age, based on a 2,000-kilocalorie daily diet. Among 16 selected dishes, 6 exceeded one-third of the daily energy recommendation per serving (Figure 3a), including pad thai (997.8 kcal), stir-fried basil pork with rice (777.9 kcal), and pork congee (1,148.7 kcal). Seven dishes exceeded one-third of the daily fat limit (65 g), with grilled pork skewers containing the highest fat content (55.0 g) (Figure 3b). All samples lacked adequate dietary fibre (Figure 3c), and none met one-third of the 25 g recommended daily intake; while spicy papaya salad (som tum) and fish maw soup had the highest fibre content at 3.9 g, this still fell significantly short. Sodium content was a widespread issue. Every dish exceeded one-third of the recommended daily limit (Figure 3d), with several surpassing the full daily threshold of 2,000 mg, including fish maw soup (3,110.2 mg), glass noodle spicy salad (2,428.4 mg), and clear broth pork noodle soup (2,409.9 mg).¹¹

In 2020, the Nutrition Association of Thailand launched the Nutritional and Environmental Management of Street Food project to improve the nutritional quality and safety of street food. The initiative focused on setting nutritional standards, developing monitoring systems, and building vendor capacity. Analysis of 59 street food items revealed that 61% (36 items) had potential for nutritional enhancement, while 39% (23 items) did not meet existing dietary guidelines. Before recipe modifications, 36% of items exceeded recommended energy limits (more than 600 kcal for main dishes and over 200 kcal for snacks or beverages). Post-reformulation, energy content decreased

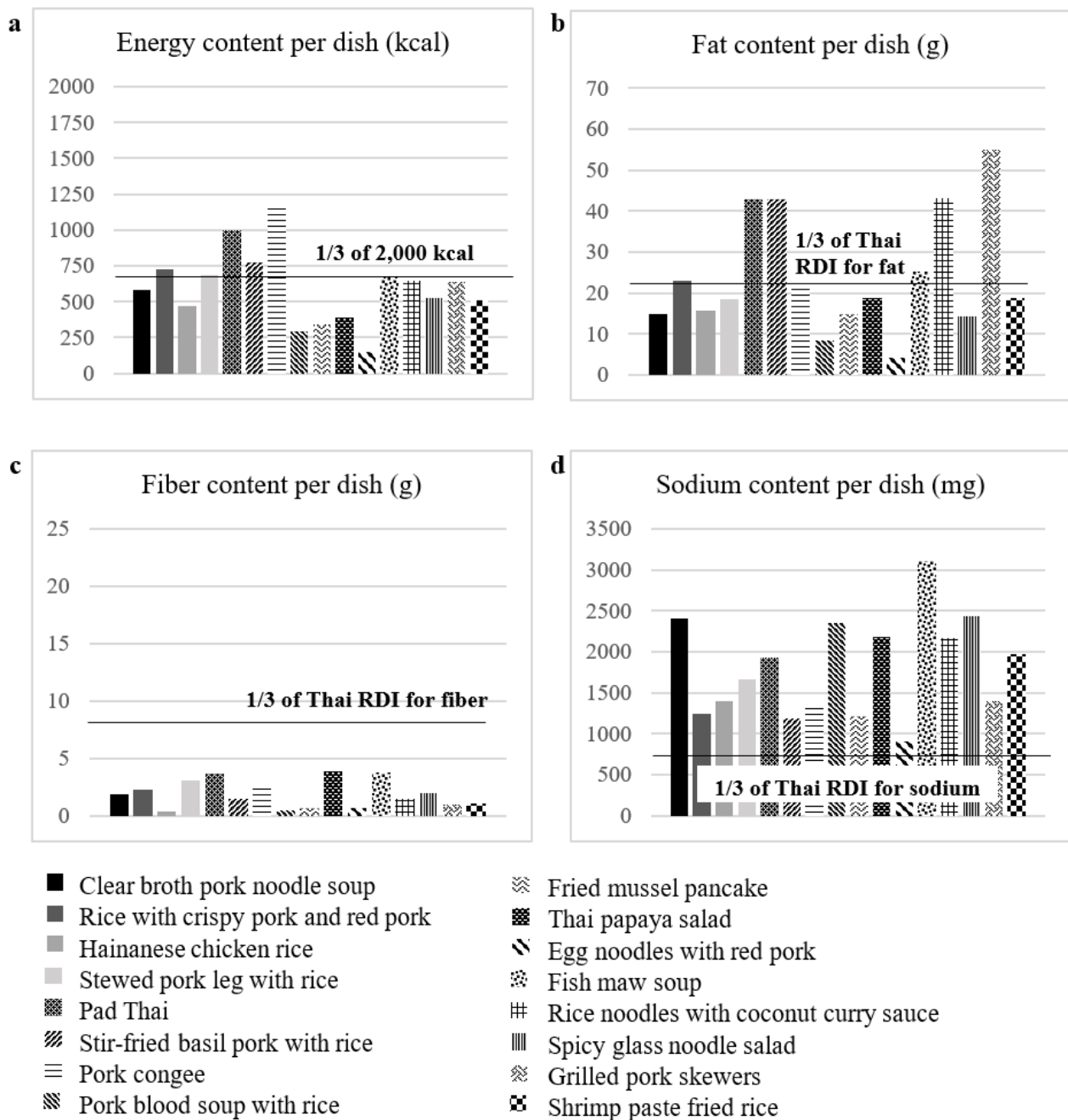


Figure 3. Nutritional profiles of 16 selected street food items compared with the Thai Recommended Daily Intakes (Thai RDIs) 11: (a) energy, (b) fat, (c) fiber, and (d) sodium.

in most items, with several achieving compliance. Sugar was initially excessive in 56% of items; while reductions were achieved, few items fully met the guidelines. Saturated fat levels exceeded limits in 25% of items, with mixed outcomes following reformulation. Sodium remained the most critical concern: 64% of items surpassed the recommended threshold prior to modifications. Although improvements were made, many items continued to exceed safe limits. Initial fibre content was insufficient in over half of the main dishes; however, most showed improvement after recipe changes. The project demonstrated measurable success in enhancing the nutritional profile of Thai street food through strategic recipe reformulation.²⁷

These findings underscore the urgent need for comprehensive public health interventions aimed at raising nutri-

tional awareness and promoting healthier choices in Thailand's eating-out and food delivery sectors. Given the central role of out-of-home meals in urban Thai diets, addressing these nutritional shortcomings is essential to curbing the rise of diet-related chronic diseases and improving long-term population health. Importantly, when prepared with balanced ingredients and mindful techniques, traditional Thai cuisine holds considerable potential to support healthy dietary patterns.

CURRENT POLICIES AND GUIDELINES ON EATING OUT

As Thailand undergoes rapid urbanisation and shifts in lifestyle patterns, the frequency of out-of-home food consumption has markedly increased across all socio-economic strata. This trend has prompted mounting

concerns regarding both the nutritional quality and safety of meals consumed outside home. In response, the Thai government has developed a series of national policies and guidelines aimed at improving the nutritional adequacy, hygiene, and safety of such meals. These initiatives are grounded in an integration of traditional dietary practices, modern nutritional science, and regulatory frameworks, reflecting Thailand's dual priorities of promoting public health and sustaining the economic vitality of sectors such as food tourism and the informal street food economy.

Despite notable progress, Thailand continues to face the dual burden of malnutrition, where undernutrition coexists with rising rates of overweight and obesity. To address this complex issue, a range of policy interventions has been implemented, including nutrition education, public awareness campaigns, taxation on sugar-sweetened beverages, and a ban on the sale of sodas in schools.^{28,29} Furthermore, Thailand has enacted a successful ban on trans fats through the prohibition of partially hydrogenated oils and continues to monitor trans-fat levels in food products, an exemplar of enforceable nutrition policy.³⁰

Public health strategies targeting out-of-home food consumption are embedded within broader national efforts to mitigate diet-related non-communicable diseases, which have become a pressing health concern. Through its Bureau of Nutrition, the Ministry of Public Health has developed food-based dietary guidelines to promote balanced eating patterns. These guidelines emphasise dietary diversity; increased consumption of vegetables, fruits, legumes, lean meats, and fish; and reduced fat, sugar, and sodium intake. They also address food safety and advocate for moderation in alcohol consumption.^{31,32}

To operationalise these objectives, several targeted policy measures have been introduced. Among the most prominent is the Less Salt Thailand campaign, which aims to reduce national sodium consumption through public education, collaboration with the food industry, and promotion of low-sodium alternatives in restaurants and street food outlets. This initiative is especially pertinent given the high sodium content commonly found in Thai out-of-home meals, a significant dietary risk factor for hypertension and cardiovascular disease.³³ Complementing this is the Healthier Choice front-of-package labelling system, designed to help consumers identify more nutritious packaged food options. While initially applied to processed foods, the system is gradually being extended to food service establishments, with some restaurants and food courts now providing calorie and nutrient information to support informed consumer choices.^{34,35} However, inconsistencies with international benchmarks have posed challenges in food categorisation and consumer comprehension.³⁶ Although several food companies in Thailand have adopted policies aimed at curbing obesity and preventing non-communicable diseases, these often lack clear implementation strategies and robust monitoring mechanisms, resulting in limited translation of broad policy commitments into measurable outcomes.³⁷

Food safety within Thailand's vast informal food sector remains a persistent challenge. To address this, the Minis-

try of Public Health has implemented the Clean Food Good Taste certification programme, which establishes voluntary standards for sanitation, hygiene, and food handling. Certified establishments are assessed based on such criteria as cleanliness of preparation areas, water and utensil hygiene, and pest control. While participation is voluntary, certification acts as a recognisable indicator of quality and safety for consumers.³⁸ Concurrently, the Thai Food and Drug Administration enforces national food safety regulations through both general and category-specific legislation encompassing food safety, labelling, and advertising standards.³⁹

Efforts to formalise the street food sector have sought to enhance hygiene practices without diminishing the cultural and economic value of informal food vendors. Nevertheless, significant challenges remain, particularly in enforcing regulatory standards in contexts where vendors operate outside the formal economy.⁴⁰ The Bangkok Metropolitan Administration, in collaboration with national health authorities, also plays a role in regulating street food vending to mitigate health hazards, waste accumulation, and environmental pollution. Initiatives such as the Street Food Program aim to upgrade vendors' operations, encouraging compliance with hygiene standards and promoting long-term sustainability.⁴¹

While Thailand's food tourism strategy has successfully positioned Thai cuisine as a globally recognised brand, efforts to integrate health and sustainability considerations into this agenda remain nascent. A more holistic policy framework, one that harmonises economic development with public health and environmental sustainability, is essential for long-term success.⁴²

In conclusion, Thailand's current approach to managing the nutritional quality and safety of out-of-home food consumption reflects a comprehensive and proactive public health strategy. However, persistent challenges, including limited enforcement in the informal sector, uneven implementation of food labelling in restaurants, and public resistance to certain regulatory measures such as sodium taxation, underscore the need for continued innovation, stronger cross-sector coordination, and sustained public engagement. As Thailand's food environment continues to evolve, future policies must strike a careful balance among cultural traditions, economic priorities, and the imperative to address diet-related chronic diseases, thereby ensuring that out-of-home dining contributes positively to national health objectives.

POTENTIAL IMPACT ON HEALTH OUTCOMES

The growing prevalence of food consumed away from home in Thailand reflects broader patterns observed across many low- and middle-income countries. Meals prepared outside home are often characterised by high energy density and poor nutritional profiles, commonly containing excessive saturated fats, added sugars, and sodium while lacking adequate dietary fibre, fruits, and vegetables. Typical offerings, such as stir-fried noodles, deep-fried meats, and coconut-milk-based curries, frequently exceed recommended limits for caloric and sodium intake. In the absence of portion control or nutritional awareness, routine consumption of such foods leads to a

positive energy balance, compromised diet quality, and an elevated risk of weight gain.

This dietary shift has far-reaching public health consequences, particularly concerning nutritional adequacy and the increasing burden of non-communicable diseases.⁴³ As urban living intensifies and time constraints, changing work schedules, and convenience-oriented behaviours reshape eating habits, the frequency of meals obtained from street vendors, restaurants, and OFD services has increased significantly. This trend has been linked to a variety of adverse health outcomes that warrant critical public health attention.

A growing body of evidence links eating away from home to reduced dietary quality, defined by higher intake of total calories, fats, and sugars, alongside lower consumption of essential nutrients such as fibre, calcium, and vitamins.^{44,45} Research indicates that meals eaten outside the home, especially when constituting core meals such as breakfast, lunch, or dinner, are associated with increased total energy intake and decreased consumption of fruits, vegetables, and whole grains.⁴⁶ Among urban children, the dietary transition toward high-fat, low-fibre patterns has also been associated with unfavourable shifts in gut microbiota composition, potentially affecting long-term metabolic health.⁴⁷ For low-income urban populations, the affordability and convenience of food away from home often outweigh nutritional considerations, a challenge exacerbated by the limited availability of healthier food alternatives in many urban environments.

Moreover, studies show that individuals who consume food away from home more than twice weekly exhibit lower Healthy Eating Index scores, suggesting poorer overall diet quality compared to less frequent consumers.^{48,49} This trend has also contributed to increased portion sizes and the regular consumption of energy-dense, hyper-palatable foods high in sugar and fat.⁵⁰ These developments undermine consumers' awareness of appropriate portion sizes and nutritional content. The widespread availability of food away from home, particularly from quick-service establishments, reduces individual autonomy over food choices and nutritional balance.⁵¹ Many pre-prepared meals offer limited customisation, encouraging reliance on external food environments at the expense of personal dietary preferences and needs.⁵² Social dynamics such as communal dining with friends or family can further influence dietary choices, often leading to the selection of less healthy options.⁵³

In addition to its nutritional risks, the rising reliance on food away from home, particularly from informal food settings like street markets, presents serious food safety concerns. Persistent challenges such as inadequate hygiene, improper food storage, and cross-contamination contribute to foodborne illness and gastrointestinal infections, especially among vulnerable groups including children, the elderly, and tourists. Although initiatives such as the Clean Food Good Taste certification programme have improved sanitation in select areas, enforcement remains inconsistent across geographic regions.

In conclusion, the increasing trend of eating away from home in Thailand presents multifaceted public health challenges ranging from poor dietary quality and increased non-communicable disease risk to concerns over

food safety. While food away from home aligns with the practical demands of modern urban lifestyles, its adverse health impacts are well documented. Addressing these challenges requires a coordinated public health response that incorporates nutrition education, stringent regulatory oversight of food service providers, reformulation of frequently consumed dishes, and expanded access to affordable, nutrient-dense food in both formal and informal food sectors. Importantly, these interventions must be contextually appropriate, recognising that urbanisation and economic development, while facilitating access to diverse food options, also necessitate policy frameworks that protect nutritional health. Promoting the re-adoption of traditional Thai dietary patterns, rich in vegetables, legumes, and minimally processed foods, alongside targeted health promotion initiatives will be critical to mitigating the negative health effects of Thailand's evolving food landscape.

POTENTIAL TO IMPROVE THE FOOD ENVIRONMENT FOR MEALS AWAY FROM HOME

Improving the nutritional quality of food consumed outside the home in Thailand presents a critical opportunity to advance national public health goals, particularly in the prevention of non-communicable diseases and the promotion of dietary equity. As out-of-home eating becomes increasingly prevalent across various demographic and socio-economic groups, the broader food service sector, including street vendors, restaurants, institutional cafeterias, and OFD platforms, emerges as a key target for health-promoting interventions. A systems-based, multi-sectoral approach is essential to transform this environment into one that fosters healthier dietary behaviours.

One of the most direct and impactful strategies involves the reformulation of commonly consumed meals to reduce excessive levels of sodium, added sugars, and unhealthy fats. Achieving this goal requires coordinated collaboration among government agencies, public health institutions, and food service stakeholders. The introduction of nutrient benchmarks, whether voluntary or mandated, for popular dishes such as stir-fried noodles, soups, and grilled meats could substantially lower the population's intake of harmful nutrients while preserving cultural relevance, palatability, and affordability. In parallel, promoting healthier cooking techniques (e.g., steaming, grilling, or low-oil stir-frying) and increasing the availability of vegetable-rich and plant-based dishes would support both nutritional quality and dietary diversity.

Addressing dietary inequities remains a central objective in the development of equitable food environment policies. While interventions targeting food composition, labelling, advertising, and pricing offer potential to reduce health disparities, current evidence on their effectiveness is still emerging.⁵⁴ Nevertheless, Thailand's recent revisions to its food-based dietary guidelines represent a national policy effort to address the dual burden of undernutrition and overnutrition across all life stages.²⁹

Consumer empowerment constitutes another key component of out-of-home food environment reform. Menu labelling initiatives that disclose caloric and sodium content, along with the adoption of front-of-package symbols such as the Healthier Choice logo, can enhance consumer

awareness and facilitate informed decision making. Behavioural interventions, including repositioning healthier items at the top of menus, offering smaller portion sizes, and employing pricing strategies to favour balanced meals, have demonstrated efficacy in influencing food choices without limiting consumer autonomy.

Nutrition education remains a cornerstone of sustainable dietary behaviour change. In Bangkok, school-based programmes have been effective in promoting healthier eating patterns, particularly by increasing fruit and vegetable intake among children.⁵⁵ Expanding these efforts through community-level campaigns and digital outreach can broaden their reach and impact. Community-based nutrition programmes, which integrate grassroots participation with policy-level support, have proven successful in improving nutrition outcomes in diverse settings.⁵⁶ Leveraging digital platforms, such as mobile applications, websites, and social media, can further amplify these initiatives by delivering tailored, accessible, and engaging content. Integrating digital tools with school and community-based programmes may also enhance programme efficacy and contribute to broader public health gains, including reduced healthcare expenditures and improved nutritional outcomes.⁵⁷

Comprehensive and sustained policy and environmental interventions are essential to support long-term improvements in the out-of-home food landscape. Key strategies include reformulating restaurant meals, enhancing the food retail environment to facilitate healthier purchasing decisions, and introducing zoning laws to expand access to nutritious food outlets in underserved communities. Nudging techniques, such as placing healthier products at eye level or offering discounts on fruits and vegetables, have demonstrated effectiveness in shifting consumer behaviour toward more healthful options.^{58,59} Macro-level policy interventions, as outlined in ecological models of food environments, are vital in addressing structural inequalities in food access and diet quality.

Capacity building among food vendors, particularly within the informal sector, is critical given their central role in Thailand's vibrant street food culture. Training programmes focused on nutrition, food safety, and cost-effective preparation of healthier meals can support vendors in aligning their offerings with public health objectives.²⁷

The rapid expansion of food delivery platforms presents new opportunities to harness digital technology for nutrition promotion. These platforms can integrate such features as nutrition filters, default healthier options, and personalised dietary recommendations. Strategic collaborations between public health authorities and platform providers may also facilitate data collection on consumer behaviour, enabling the design of more targeted interventions and real-time programme evaluation.

The potential to improve the out-of-home food environment in Thailand is substantial. At the policy level, coordinated reforms are needed at both municipal and national levels to establish a regulatory infrastructure conducive to healthier eating. A multifaceted strategy encompassing meal reformulation, consumer education, vendor engagement, digital innovation, and legislative action is critical to creating an enabling environment that

supports informed and health-promoting food choices. This includes setting nutritional standards for public food procurement (e.g., in schools, hospitals, and government canteens), implementing urban planning policies to increase access to healthy food venues, and providing fiscal incentives to vendors offering low-sodium, high-vegetable dishes.

Public-private partnerships may further accelerate progress by piloting and scaling models for health-focused street food markets and food courts. However, all such efforts must be culturally sensitive and recognise the social and communal significance of public eating in Thai society. Eating out is not merely a nutritional act but a deeply ingrained cultural tradition. Therefore, interventions must carefully balance health promotion with the preservation of cultural values.

Finally, sustained improvements in the food environment will require attention to broader structural and socio-economic determinants of food access and choice. Addressing these root causes is essential to achieving equitable and lasting progress toward Thailand's national nutrition and public health goals.

NEED FOR GUIDANCE IN MEAL CHOICES

Thailand is currently undergoing a significant nutrition transition, characterised by a rising prevalence of overweight, obesity, and diet-related non-communicable diseases. This shift is largely attributed to rapid changes in dietary patterns, urbanisation, the expansion of modern food retail systems, and broader socio-economic developments. Amid these transformations, the nutritional quality of meals consumed outside the home, including those purchased from street vendors, restaurants, and food delivery services, remains a pressing public health concern. While healthier food options are available within the food service sector, their limited accessibility, affordability, and appeal underscore the need for comprehensive interventions targeting both supply-side and demand-side determinants within the food environment. The informal nature of this sector often results in limited transparency regarding the nutritional content of meals.

Although traditional Thai cuisine incorporates nutrient-dense ingredients such as vegetables, herbs, and spices, common preparation methods frequently result in elevated levels of sodium, sugar, and saturated fat. In the absence of user-friendly tools and widespread nutrition education, consumers encounter substantial barriers to making dietary choices that align with national dietary guidelines. Moreover, the extensive use of digital food promotion further complicates efforts to improve diet quality.

Low nutrition literacy remains a pervasive challenge, limiting individuals' ability to recognise the health implications of frequent consumption of foods high in sodium, sugar, and unhealthy fats, particularly when dining outside the home. Cultural preferences for intense flavours and large portion sizes add another layer of complexity, impeding efforts to encourage health-conscious eating. Compounding these issues is the limited implementation of culturally grounded nutrition education programmes capable of addressing the behavioural and societal norms that influence food choices.

While Thailand's dietary guidelines provide a robust framework promoting fruit and vegetable consumption and moderation of salt and sugar, their practical implementation remains limited. Public health campaigns, including those promoting sodium reduction and the Healthier Choice label, have shown some success but require broader outreach and more intensive reinforcement, particularly in urban and rural settings where eating out is prevalent.

To foster healthier meal selections, a comprehensive, multi-pronged strategy is required. This strategy should include expanding nutrition labelling on restaurant menus and packaged foods to improve transparency at the point of purchase; developing culturally tailored nutrition education programmes that reflect local culinary traditions and consumer behaviour; building capacity for food vendors, especially in the informal sector, to adopt healthier cooking techniques and modify recipes to enhance nutritional quality; and integrating digital tools and platforms, such as mobile applications offering real-time dietary guidance and healthy food recommendations. Achieving these objectives necessitates robust cross-sectoral collaboration involving government agencies, public health organisations, food industry actors, technology innovators, and media institutions. Such partnerships are essential for ensuring consistent health messaging, shaping food systems, and creating enabling environments that support sustained behaviour change at scale.

Ultimately, building a resilient and health-promoting food system in Thailand requires a coordinated, evidence-based, and culturally informed approach. This approach must prioritise transparency, inclusivity, and continuous adaptation in response to the country's rapidly evolving food landscape. By addressing the structural, behavioural, and cultural determinants of dietary choice, Thailand can make meaningful progress toward improving population health and reducing the burden of nutrition-related diseases.

DISCLOSURE ON THE USE OF AI AND AI-ASSISTED TECHNOLOGIES

AI technologies were used for language proofreading. The authors reviewed and edited the content and takes full responsibility for the content of the publication.

CONFLICT OF INTEREST AND FUNDING DISCLOSURES

No competing interests are reported.

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