



Investigating Food Waste Management in Five-Star Hotels in Thailand

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Abstract

Regarding to the growth of food service to serve an increasing number of domestic and international tourists throughout the world, this has contributed a serious food waste problem. In the hotel industry, food waste usually occurs from the production to the consumption of food. In addition, many five-star hotels offer buffets to their guests, which is considered as one of the main causes of food waste in hotels. This meant unnecessary food costs and a burden on the environment. The objectives of this research are to study the current situation of food waste in five-star hotels in Thailand and to identify prevention and management practices of food waste in five-star hotels in Thailand. This research used a qualitative approach aiming to implement training of the hotel staff for the 15 people who are responsible for food waste management. The analysis had found that to prevent food waste, five-star hotels in Thailand have taken several steps. These include developing a food waste management strategy with clear goals and procedures, implementing standard operating procedures and written instructions to prevent food waste, carefully screening raw materials before sourcing them from suppliers, investing in quality storage facilities, using the first-in-first-out method (FIFO), and clearly labeling food portion sizes and offering different portion sizes at different prices. However, it is necessary for further research to identify the procedures or methods used to manage food waste in small-scale hotels in Thailand.

Keywords: Food Waste Management, Food Waste Prevention, Five-Star Hotels, Sustainability, Hospitality Industry

Introduction

Thailand has identified food waste as a critical issue (Thailand Development Research Institute, 2018; Bunditsakulchai & Liu, 2021), with the increasing number of domestic and international travelers in the hospitality business (Kaza et al., 2018), food waste is becoming a problem for Thailand (Thailand Development Research Institute, 2018; Bunditsakulchai & Liu, 2021). This industry is a major contributor to food waste



(Papargyropoulou et al., 2019; Karakas, 2021), especially in the restaurant, pub, healthcare and hotel sectors. (Tuppen, 2014, Karakas, 2021). Thailand Development Research Institute (2019) identified that the food waste issue became a priority concern for hospitality businesses in many travel destinations across Thailand, such as Bangkok, Chiang Mai, Phuket, Chonburi, Nakhon Ratchasima, etc. In Bangkok alone, a study found that a hotel produced a remarkable 1.3 tons of edible food waste in just one week (Lephilibert, 2016). Recently, Thailand's hospitality industry has resumed from COVID 19 pandemic and numerous travelers target Thailand as a destination for their trips (Wongmontra, 2021). Several chain hotels have already implemented strategies to reduce food waste while many other hotels have been increasingly aware of food waste management (Thailand Development Research Institute, 2019).

When considering five-star hotels, the hotel facilities have abilities to maintain customer's perceptions such as security, safety, health of guests (Purohit et al., 2023), and food experiences (Hu et al., 2021). In spite of the fact that food services in hotels are the important components for successful hotel to generate revenue by providing satisfying and memorable experiences for guests, they generate significant food waste problems (Riis, 2014; Pirani and Arafat, 2016; Langford & Weissenberg, 2018; Kaza et al., 2018; Papargyropoulou et al., 2019), because of increasing food operations in order to serve the rising demands for international tourists arrival (Kaza et al., 2018). Among different levels of hotels, 5-star hotels have a greater number of food service operations, including banquet services, outlets, events, and room services, leading to the potential for a larger amount of food waste (Gunders, 2017; Okumas et al., 2020; Karakas, 2021). However, research on food waste management in the hotel sector has received fewer studies (Wang et al., 2017; Dhir et al., 2020).

Food waste research has tended to focus on household food waste, food waste behavior, and family or individual awareness (Chen, 2019; Russell et al., 2017; Stancu et al., 2016, Luu, 2020). The research specifically focusing on five-star hotels is still limited (Papargyropoulou et al., 2019; Okumus, 2020). For example, Kasavan et al. (2019) assessed a research conducted in five-star hotels, but they focused on hotels in Malaysia only, while Luu (2020) conducted the research in Vietnam. Moreover, Karakas (2021) analyzed research on food waste management in luxury hotels in Hungary. In Thailand, research about food waste management was found in Phuket alone (Puangmanee & Chuaisinuan, 2021). Liu et al. (2021) reviewed the research from Bangkok, Thailand which studied household food and plastic wastes during COVID 19. There was a study focused on the market in Petchaburi which studied food production only (Ounsaneha et al., 2019). However, research on food waste prevention and management within Thailand's five-star hotels remains limited. The study attempts to fill the academic gap by



examining the operational practices and perceived barriers by industry professionals in order to offer evidence-based insights for sustainable waste management.

Objectives

- (1) What are the factors that affect food waste management in five-star hotels in Thailand?
- (2) What are the hotel management practices to mitigate waste food in five-star hotels in Thailand?

Concept theory framework

Food loss and waste (FLW) is a global problem that affects the economic, social and environmental aspects of sustainable development (Flanagan et al., 2019; Srijuntrapun et al., 2022; Talukder et al., 2024). Reducing FLW can bring multiple benefits for the economy, society and environment, and support the achievement of the Sustainable Development Goals (Cattaneo et al., 2021; Vieira et al., 2022). Therefore, it is imperative to adopt a holistic approach to prevent and reduce FLW (Dora et al., 2021), based on a “food use-not-waste” hierarchy that prioritizes prevention, recovery and redistribution of safe and nutritious food to people, reallocation of resources for feed, recycling and recovery, and ultimately disposal if no other solution is available (Torres de Matos & Manfredi, 2016; Blakeney, 2019).

Hotels, especially full-service, five-star, and luxury hotels, offer a variety of food services to their guests, such as breakfast, lunch, dinner, room service, banquets, buffets, catering, and minibars (Correia et al., 2022; Jain et al., 2023). However, these food services also generate significant amounts of FLW, due to factors such as overproduction, portion size, guest preferences, menu design, staff training, storage conditions, inventory management, procurement practices, and plate waste (Linh, 2018; Al-Obadi et al., 2022). Therefore, hotels need to adopt effective FLWM practices that can reduce their FLW generation (Vizzoto et al., 2020), enhance their food quality and safety (Paritosh et al., 2017; Wang et al., 2021), increase their customer satisfaction and loyalty, improve their operational efficiency and cost savings, and demonstrate their commitment to sustainability (Despoudi et al., 2021).

Recent publications highlight various food waste prevention strategies, for example the study shown the important role of hospitality employees to raise awareness in food waste prevention within organizations (Pearson et al., 2025). Some research discussed food waste prevention strategies, include food waste audits, staff training programs, and implement awareness campaign (Pinto et al., 2018). Moreover, some studies suggest different methods for analyzing food waste prevention to enhance



its effectiveness (Cristóbal et al., 2017). However, research on this topic remains limited, particularly in Thailand, where most studies focus on five-star hotels.

Materials and Methods

This research used a qualitative research design and conducted in-depth interviews to collect complex management insights.

Data Collection: Semi-structured in-depth interviews were conducted with 15 hotel managers responsible of food operations. The questions in the interview focused on the causes of waste, current measurement techniques, and standard operating procedures (SOPs) for waste separation.

Data Analysis: The narrative data collected was by topic analyzed to synthesize common practices and challenges across the participating hotels.

The participating hotels are shown in Table 1.

Table 1: The representatives of five-star hotels

Hotel	Position	Chain/ Non-Chain	STR Chain Scale	Location
Hotel 1	Manager Level	Chain	Luxury	Bangkok
Hotel 2	Manager Level	Chain	Upper Upscale	Bangkok
Hotel 3	Manager Level	Chain	Upscale	Chiang Mai
Hotel 4	Manager Level	Non-Chain	-	Chonburi
Hotel 5	Manager Level	Chain	Luxury	Chiang Mai
Hotel 6	Manager Level	Chain	Upscale	Bangkok
Hotel 7	Manager Level	Chain	Upper Upscale	Bangkok
Hotel 8	Manager Level	Chain	Upper Upscale	Bangkok
Hotel 9	Manager Level	Chain	-	Bangkok
Hotel 10	Manager Level	Chain	Midscale	Bangkok
Hotel 11	Manager Level	Non-Chain	-	Chiang Mai
Hotel 12	Manager Level	Chain	Upper Upscale	Bangkok
Hotel 13	Manager Level	Chain	Upper Midscale	Bangkok
Hotel 14	Manager Level	Chain	Upper Midscale	Bangkok
Hotel 15	Manager Level	Chain	Luxury	Bangkok

According to this research, the population consisted of five-star hotels located in Thailand which certified by Thai Hotels Association. As of 2020, there were 27 standard certified five-star hotels located across Thailand. The invitation letters were sent to all of them, it was expected that 20 representatives will reach data saturation. However, only 15 hotel representatives accepted the invitations as shown in Table 1.



Results

The data obtained from interviews is summarized in Table 2.

Table 2: Summary of the amount of food waste generated in five-star hotels

Hotel	Amount of food waste (approximately)
Hotel 1	200 kg/day during low season, and 350 kg/day during high season
Hotel 2	400 – 500 kg/day
Hotel 3	-
Hotel 4	5 – 7 kg/day
Hotel 5	100 kg/day, and 200 kg/day (in case there is an event)
Hotel 6	280 kg/day
Hotel 7	90 – 100 kg/day, and more than 150 kg/day (in case there is an event)
Hotel 8	70 kg/day
Hotel 9	3 – 10 kg/day
Hotel 10	30 – 45 kg/day
Hotel 11	50 kg/day
Hotel 12	42 kg/day
Hotel 13	30 kg/day
Hotel 14	200 – 250 kg/day
Hotel 15	150 kg/day

Table 2 shows daily waste generation in the hospitality sector fluctuates significantly based on seasonality and operational scale. Volume rises from 200 kg in the low season to 350–500 kg during peak periods, with post-event waste averaging 150–200 kg.

Output is determined by capacity. Hotels with under 500 rooms produce 50 kg daily, while larger establishments exceed 100 kg. Additionally, management structure impacts efficiency; chain hotels maintain levels below 100 kg, whereas independent hotels consistently surpass this threshold. These variations highlight occupancy levels and stable management approaches in environmental impact.



Conclusions and Discussion

1. Situation and Generation Factors Food waste in Thailand's five-star hotels originates from four primary streams: plate residue, overproduction, spoilage, and preparation trimmings. While daily volumes fluctuate between 3 kg and 500 kg based on seasonality, the service format is the most critical determinant of waste volume. Buffets exhibit higher volatility and surplus compared to the structured demand of banquets. However, a significant operational strength was revealed: preparation waste remains below 5% of total ingredients. This indicates that Thai luxury hotels maintain high technical proficiency and effective trimming protocols compared to global benchmarks.

2. Systematic Management and Strategic Implementation The thematic analysis of 15 establishments transitions the perspective of food waste from an environmental obligation to a core **"Strategic Resource Management"** paradigm. This integration is defined by four pillars:

- **Adaptive Procurement:** Spoilage risks are mitigated at the source through high-frequency, forecast-driven procurement cycles to minimize inventory surpluses. Hotels 4 and 13 prioritize daily or biennial ordering to align with fluctuating guest volumes (*"Raw material will be ordered day by day or every 2-day based on number of guests and forecasting of walk-in guests"*).
- **Creative Valorization:** Advanced culinary proficiency facilitates a micro-level circular economy where "by-products" are transformed into value-added items. Evidence from Hotels 4 and 15 demonstrates repurposing trimmings and bones into gourmet sauces and broths (*"The crumbs of meat that cannot be used in cooking will be transformed... The bones can used to make a broth as well"*).
- **Dynamic Buffet Optimization:** To reconcile luxury with sustainability, hotels utilize "just-in-time" production. Hotels 1 and 11 implement gradual replenishment to ensure freshness while reducing overproduction costs (*"We won't overcook. When the menu is almost finished, we will fill it up"*).
- **Institutionalized Accountability:** Waste reduction is formalized through Standard Operating Procedures (SOPs) and monthly audits to analyze waste typologies and refine mitigation strategies (*"The hotel has a Standard Operating Procedure (SOP)... We will have a meeting every month to discuss about quantity and type of food mostly wasted"*).

Strategic Implications: The study concludes that lean and agile production effectively mitigates waste risks in luxury hospitality.

- **Industry:** Hotels must transition from "waste disposal" to "value recovery" via culinary creativity.



- **Policy:** Policymakers should bridge the "Infrastructure-Practice Gap" through specialized daily waste collection.
- **Scalability:** Future research should adapt these "Lean and Agile" practices to small-scale hotels to drive industry-wide sustainability.

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