

The role of orange flag application in preventing food waste in tourism enterprises

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ABSTRACT

Keywords:

Food Waste,
Sustainability,
Food Security,
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Food Friendly Orange Flag.

Food waste remains a significant global challenge, leading to profound environmental and economic consequences. This study explores food waste levels in hotel establishments and evaluates the impact of the Food Friendly Orange Flag initiative in promoting sustainable practices. Employing a qualitative research approach, the study conducted semi-structured interviews with 20 head chefs from hotels located in the Aegean region of Türkiye, selected to represent a range of hotel sizes and operational scales. The data were analyzed using thematic analysis to identify prevalent patterns and challenges related to food waste management. The findings reveal a high level of awareness among hotel staff regarding the Orange Flag initiative, with many establishments expressing intentions to adopt its guidelines. However, the study identifies key obstacles, including excessive guest food consumption, insufficient portion control, and inefficiencies within the supply chain that exacerbate food waste. Furthermore, gaps in staff training and inconsistent waste monitoring practices were highlighted as areas requiring improvement. The study concludes that structured interventions such as enhanced staff education, improved portion management strategies, and active guest engagement—are essential for reducing food waste in the tourism sector. It also underscores the importance of initiatives like the Food Friendly Orange Flag in fostering sustainable practices, which contribute to both environmental conservation and economic efficiency in hotel operations.

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1. Introduction


Food waste is a pervasive global issue that significantly impacts humanity and poses serious environmental and economic challenges (Chen et al., 2020). In developed countries, rising income levels and the consequent increase in both the quantity and diversity of consumption have made food waste more prominent (Dhir et al., 2020). Factors such as the growing trend of eating outside the home, the proliferation of shopping malls, and aggressive marketing strategies further exacerbate food waste (Bulut et al., 2019). According to research conducted by the Boston Consulting Group (BCG, 2018), food waste amounted to 1.6 billion tons (valued at \$1.2 trillion) in 2018 and is projected to reach 2.1 billion tons (equivalent to \$1.5 trillion) by 2030. Additionally, the global demand for agricultural production is expected to rise by 35–50% between 2012 and 2050, driven by population growth and increasing income levels (Karakan & Çolak, 2021). From an economic perspective, developed countries waste more

food compared to developing and less developed nations. For example, in the United States, approximately 88 million tons of food are wasted annually, with a monetary value of around 143 billion Euros (Daysal & Demirbaş, 2020).


Fruits and vegetables constitute the most wasted food category globally, accounting for 44% of total food waste. This is followed by root and tuber crops and cereals (Gönültaş et al., 2020). The most wasteful stages in the food supply chain occur during consumption (35%), followed by production (24%), collection and storage (24%), and distribution (5%) (Gönültaş et al., 2020). Additionally, the 2021 UN Food Waste Index Report indicates that 61% of food waste takes place in households, while 26% occurs in food service establishments, and 13% in retail food outlets (Ceyhun-Sezgin & Ateş, 2020).


An analysis of food waste in Türkiye reveals that the country ranks first in terms of food waste across Europe and the Middle East (Çavuş, 2021). Annually,

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Research Paper

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approximately 26 million tons of food are wasted in Türkiye, representing around 15% of the nation's gross national income (Tekiner et al., 2021). Furthermore, between 25–40% of the fruits and vegetables produced—equivalent to 12–20 million tons annually—are wasted, along with approximately 7% of the bread produced, which amounts to 1.7 billion loaves each year (Karakan & Çolak, 2021). Research indicates that food waste in mass consumption venues—such as restaurants, hotels, and cafeterias—is primarily consumer-induced (Dhir et al., 2020). The extent of food waste in these settings is influenced by multiple factors, including the demographic characteristics of consumers, portion sizes, the variety and flavor of the food, its presentation, and the overall attractiveness of the dishes (Juvan et al., 2018).

The increasing global population and limited natural resources pose significant threats to food security. This situation highlights the unsustainability of the current food system and underscores the urgent need for the implementation of new, more sustainable systems (Kurt et al., 2020). Consequently, strategies aimed at reducing or preventing food waste are becoming increasingly important. It has been seen that efforts to prevent food waste in Türkiye have focused specifically on the activities of the Food Friendly Orange Flag platform as an example of best practice. The literature review revealed that existing studies primarily explore the applicability of the Food Friendly Orange Flag in businesses, its impact on operations, and its overall contributions to sustainability goals. In this study, detailed information about the platform's content and operational processes is provided, with the aim of addressing gaps in the existing literature. Additionally, the findings are expected to offer valuable insights to hotel businesses, helping to guide their decision-making processes and encouraging the adoption of sustainable practices.

2. Conceptual Framework

Food Waste and Sustainability

Contemporary sustainability challenges are escalating, with most of these issues being human-induced and manifesting across various domains, including air and water pollution, biodiversity loss, global warming, deforestation, overgrazing, overfishing, food security threats, and general environmental degradation (Abrahamse et al., 2007). Among these challenges, food security is particularly vulnerable to food loss and waste, which account for approximately one-third of all food produced globally. This not only exacerbates food shortages but also contributes to rising food prices (Martin-Rios et al., 2018). Sustainable consumption refers to a consumption approach that prioritizes environmental responsibility while considering the needs of future generations. To support sustainable consumption practices, individuals should avoid excessive consumption beyond

their fundamental needs and refrain from purchasing products that harm the environment (Bulut et al., 2019).

Food Security

The concept of food security is frequently discussed today and is often linked to issues of food waste. It holds significant importance for ensuring an adequate food supply while safeguarding environmental health. Food security refers to a state in which individuals can consistently meet their nutritional needs to maintain a healthy and active life. This encompasses reliable, ongoing access to safe, healthy, sufficient, and nutritious food—both physically and economically (Niyaz & İnan, 2016). Food security is not solely a public health concern but also intersects with economic, environmental, and commercial dimensions. To effectively manage and ensure food security, it is essential for authoritative institutions to play a proactive role in developing and implementing relevant policies. The adoption of comprehensive policies at the national level can result in long-term benefits for countries, contributing to economic stability and improved public health outcomes (Kıymaz & Şahinöz, 2010).

Food Waste in Türkiye

The number of people living below the hunger threshold in Türkiye is steadily increasing (Barımen & Şişman, 2022). A significant portion of the country's fruits and vegetables is lost during the production and distribution stages, while additional losses occur during the sales and consumption processes (Salihoglu et al., 2018). According to data from the Scientific and Technological Research Council of Türkiye (TUBİTAK), approximately 11.6 million tons of produce are lost annually (Yakameran et al., 2024), which is equivalent to four times the country's annual export of fresh fruits and vegetables. The fruit and vegetable trade in Türkiye is valued at around 100 billion TL, yet 25 billion TL of this figure is recorded as waste and loss (Maçın et al., 2024). Moreover, the loss rate of fruits and vegetables before they reach the final consumer is estimated at approximately 48% (Doğdu et al., 2024). In addition, around 100 billion TL is wasted annually due to food residues generated during mixed breakfasts—a common dining practice in Türkiye—where many food items, such as cheese, olives, and jam, are discarded without being consumed (Karakan & Çolak, 2021).

Food Waste in Hotel Businesses

Food waste is one of the most critical environmental challenges affecting people globally (Casonato et al., 2023). A review of the academic literature reveals that existing studies predominantly focus on food waste within food and beverage establishments and hotel businesses (Çetinoğlu & Ünlüönen, 2020). In particular, the open buffet service system, which is widely implemented in hotels, has been shown to encourage overconsumption by offering a wide variety of food and beverage options simultaneously (Chang et al., 2022). To mitigate this issue,

it is essential to regulate the quantity, variety, and portion sizes of food and beverages served in open buffets. Additionally, raising consumer awareness about food waste can play a vital role in promoting more responsible consumption behaviors (Antonschmidt & Lund-Durlacher, 2021).

According to a study by Ceyhun-Sezgin and Ateş (2020), hotel establishments operating under the all-inclusive concept tend to prepare approximately 15% more food than required, based on the number of existing customers, when planning meal portions. The study also revealed that food waste is generated at multiple stages: 13% occurs during the production phase in hotel kitchens, 20% is wasted post-consumption in the restaurant, and additional waste is generated through beverages served in glasses. The study concluded that unconscious consumption is the primary driver of food waste. Furthermore, it identified faulty cooking methods and a lack of staff knowledge or experience as key factors contributing to waste during the production phase.

Studies on Food Waste

Numerous studies in the literature aim to assess the extent of food waste and explore strategies for its reduction. For example, a study conducted in a university cafeteria demonstrated that simply reducing the portion size of French fries led to a noticeable decrease in food waste (Freedman & Brochado, 2010). Similarly, a study focusing on breakfast buffets in hotel restaurants found that a modest reduction in plate size resulted in a 19.5% reduction in plate waste (Kallbekken & Sælen, 2013). In another study, Betz et al. (2015) found that an average of 10.47 tons of food waste is generated annually in educational establishments, while private sector establishments produce around 16.55 tons per year. Remarkably, 78–92% of this waste was identified as preventable. Similarly, Berkowitz et al. (2016) found that offering diners the choice between full and reduced portion sizes in a restaurant setting led to a decrease in the amount of leftover food. In the hospitality sector, it has been determined that an average of 1.1 kg of food waste is generated per person per day, primarily due to inaccurate demand forecasting. Notably, approximately 56% of this waste is considered preventable (Papargyropoulou et al., 2016).

A study conducted in a university cafeteria revealed that implementing warning and informative posters in academic and administrative halls led to a 39% reduction in overall food waste, with a particularly significant 83.5% decrease in bread waste (Özçiçek-Dölekoğlu & Var, 2016). In another study, it was found that an average of 210 grams of food waste was generated per person in a restaurant setting (Tatàno et al., 2017). In a hotel's breakfast buffet, an average of 15.2 grams of food waste per person per day was recorded, leading to a total of 13,087 kilograms of food waste based on the average number of customers (Juvan et al., 2018). Similarly, Dolnicar et al. (2020) found that employing game-based stamp collection activities and

distributing informative leaflets in a hotel resulted in a 34% reduction in plate waste per person. The method of cooking has also been shown to impact food waste levels. Mutlu and Sandıkçı (2019) discovered that meals prepared using grilling techniques generally produced less food waste, while wet-heat cooking methods led to higher levels of waste compared to dry-heat cooking. Additionally, their study revealed that offering local dishes reduced plate waste, whereas including multiple dishes using the same cooking method on the menu increased the amount of waste.

Food Friendly Orange Flag

Established in 2018, the Food Friendly Orange Flag Platform is a food waste prevention initiative developed by climatist Ali Akgün. Launched under the slogan “Afiyet Olsun, İsrâf Olmasın” (“Enjoy Your Meal, Don’t Waste”), the platform aims to recognize hotel establishments that demonstrate commitment to reducing food waste by awarding them the Food Friendly Orange Flag. This initiative, founded on the principle of volunteerism, allows businesses to earn the flag by meeting specific criteria and implementing sustainable practices (Büyükşalvarcı et al., 2021).

The project development and infrastructure management of the Food Friendly Orange Flag Platform are overseen by a dedicated coordination team. This team liaises with the implementation teams within participating enterprises, oversees training programs and audits, and ensures the preparation of detailed reports and analyses related to the platform’s implementation (Turuncu Bayrak, 2024). The coordination team also includes a central unit responsible for monitoring and managing all operational processes of the platform. To carry out its activities effectively, the platform collaborates with hotel establishments in various cities across Türkiye, including Antalya, Muğla, Bursa, Afyon, Rize, Belek, Alanya, Kemer, Çeşme, and Sapanca. While initially focused on hotel establishments, the Food Friendly Orange Flag has expanded its scope and is actively working towards implementation in educational institutions, municipalities, shopping malls, hospitals, restaurants, chambers of commerce, and numerous other organizations (Çetinoğlu & Ünlüönen, 2020; Ceyhun-Sezgin & Ateş, 2020; Turuncu Bayrak, 2024).

The Food Friendly Orange Flag Platform stands out as one of the leading initiatives within the Protect Your Food Campaign, organized by the Turkish Ministry of Agriculture and Forestry in collaboration with the Food and Agriculture Organization (FAO). The primary objective of the platform is to help raise environmentally conscious children and contribute to creating a livable world for future generations (Çetinoğlu & Ünlüönen, 2020). The platform’s core goals include increasing awareness among both local and foreign tourists about the issue of food waste, enhancing the knowledge of staff and guests in hotel establishments, reducing food-related expenses, and improving the overall prestige of

participating businesses (Ceyhun-Sezgin & Ateş, 2020). In addition, the platform focuses on providing educational and interactive activities for businesses, transforming food waste into valuable by-products, promoting local food production, and supporting efforts to reduce food waste while contributing to the national economy (Turuncu Bayrak, 2024).

The target audience of the Food Friendly Orange Flag program encompasses a diverse range of stakeholders, including hotels, restaurants, cafes, markets, food wholesalers, shopping malls, and facilities involved in food production and storage. The initiative also extends to various institutions such as government ministries, schools, municipalities, non-governmental organizations (NGOs), and universities. This wide-reaching approach aims to engage all entities capable of contributing to the prevention of food waste in Türkiye and globally. The Orange Flag program collaborates closely with businesses to minimize food waste. Facilities that hold a Tourism Management Certificate from the Ministry of Culture and Tourism are eligible to receive the “Orange Flag Certificate” upon meeting the established criteria (Turuncu Bayrak, 2024). To be awarded the “Food Friendly Orange Flag”, businesses must adhere to specific criteria, which include (İklim Dostu Derneği, 2024):

Reducing Food Waste:

The business must implement concrete measures to reduce food waste and establish specific, measurable targets to track progress in this area.

Data Collection and Monitoring:

The business is required to develop a systematic approach for data collection and monitoring to identify sources of food waste. This system should include regular evaluations and data analysis to support continuous improvement efforts.

These criteria are designed to promote sustainable food practices and actively reduce food waste. Businesses that successfully meet these requirements are eligible to apply for and obtain the Food Friendly Orange Flag certification.

3. Purpose of the Study

The aim of this article is to assess the level of food waste in hotel businesses and to evaluate the opinions and attitudes of these establishments regarding the Food Friendly Orange Flag initiative. The study also seeks to determine the extent to which hotels comply with the guidelines set by the Orange Flag program. Additionally, the research examines the effectiveness of the initiative in reducing food waste within hotel operations and explores its impact on overall food management practices in these businesses.

This research aims to assess the level of awareness, identify challenges, and evaluate the successes and success factors of hotel establishments in their efforts to reduce food

waste. It also seeks to examine the potential impact of the Food Friendly Orange Flag initiative on food waste reduction within hotel operations. Additionally, the study aims to gather experiences and feedback from participants regarding the implementation process.

4. Methodology

Qualitative research provides an in-depth understanding of research problems by offering a comprehensive perspective that integrates insights from various disciplines. It allows for the evaluation of the primary subject and related events within their specific contexts, analyzing them through the lens of the meanings individuals attribute to these experiences (Altunışık et al., 2010). Given these strengths, qualitative research methods were deemed appropriate for this study. Data were collected through semi-structured interviews, enabling a flexible yet focused approach to gathering in-depth insights.

In this study, a coding system was implemented to maintain the confidentiality of participants and ensure privacy throughout the research process. During the interviews, participants were identified using unique codes rather than their real names. This approach was designed to safeguard participant anonymity and uphold the impartiality of the research. The coding system was established to protect participants' identities to the highest degree without compromising the validity and reliability of the study. By using codes in place of actual names, the research aligns with established ethical standards. The coding procedure is explained in detail within the relevant sections of the article, providing readers with a clear understanding of the research methodology. A total of 20 participants from diverse age and gender groups were included in the study. Each participant was assigned a code ranging from P1 to P20, where the letter “P” denotes “Participant” and the accompanying number reflects the order in which the interviews were conducted.

Participants were thoroughly informed about the purpose, duration, and their rights concerning the study. During the information session, special emphasis was placed on the participants' right to provide or withhold informed consent for participation. Following this session, four participants chose to opt out of the study, citing concerns over the potential disclosure of sensitive information related to kitchen operations and the demanding nature of the hotel kitchen environment. Ultimately, twenty participants provided their informed consent and agreed to take part in the research. All personal information collected from participants was kept strictly confidential and was used exclusively for research purposes, ensuring compliance with ethical research standards.

For this research, an interview form was developed specifically for chefs in the Aegean region to gather information on the Orange Flag Implementation, the measures taken to reduce food waste, and the challenges

encountered in these efforts. The form comprised six questions, meticulously crafted under the guidance of three academic experts in the field. Following expert feedback, two questions were slightly revised to enhance clarity and precision. However, no new questions were added, nor were any existing questions removed, ensuring the integrity and focus of the original interview structure were maintained.

Population and Sample

In qualitative research, the elements under investigation often include various phenomena such as human communities, social groups, or specific events and situations. The population for this study comprises chefs working in hotel kitchens within the tourism sector of the Aegean Region. This population was specifically selected due to the relevance of the Orange Flag Application, a program designed to encourage the reduction of food waste in hotel kitchens.

The city of Muğla was chosen as the focal point of the research because of its status as one of Türkiye's most popular tourist destinations. The region's intense tourism activity has the potential to increase food waste in hotel kitchens, making it a suitable setting for this study. As such, the research aims to identify effective strategies for reducing food waste in hotel kitchens within the region.

The research population consisted of chefs employed in hotel kitchens across Muğla Province and its districts. A total of twenty-four chefs were invited to participate in interviews, but only twenty chefs consented. One head chef from each hotel was interviewed, as they are uniquely positioned to provide detailed insights into food waste reduction practices and are responsible for managing these processes within their respective kitchens.

5. Findings

As part of the research, 20 kitchen chefs were interviewed, and their responses are presented below, systematically organized according to the research questions.

Level of Knowledge about the Orange Flag Application

When participants were asked about their awareness of the Orange Flag Application, the majority (P1, P2, P3, P5, P6, P7, P9, P10, P12, P13, P14, P15, P17, P18, P19) indicated that they were familiar with the program and understood that it is designed to encourage the reduction of food waste.

Participants who were unaware of the initiative (P4, P8, P11, P16, P20) noted that, despite their lack of prior knowledge, they still strive to follow food waste reduction practices to the best of their ability. These participants also expressed an interest in learning more about the program and stated that they would explore the initiative further based on the information provided during the interview.

Orange Flag Application in Hotels

This section analyzes the extent to which the hotels where the chefs are employed comply with the guidelines of the Orange Flag Application. The responses highlight the level of commitment from these establishments and the specific measures they have implemented to reduce food waste.

The majority of chefs reported that the Orange Flag rules are largely followed in their hotels (P1, P3, P5, P6, P9, P10, P12, P13, P14, P15, P18, P19). Others indicated that while the rules are partially followed, there is room for improvement (P2, P7, P17). Additionally, a few chefs noted that although there are no formal practices aligned with the Orange Flag Application, they personally strive to reduce food waste through general efforts (P4, P8, P11, P16, P20).

Selected views from participants on this topic are presented below:

P6: "We comply with the guidelines to a large extent, but there is still room for improvement in some areas."

P13: "Yes, our hotel complies with these rules and has implemented various measures to reduce food waste."

P17: "We partially comply, but more effort is needed to achieve full compliance."

P8: "We don't have a specific practice for this, but we do take general measures to minimize food waste."

Status of Hotels Meeting Orange Flag Criteria

This section examines the extent to which the hotels where the chefs are employed meet the criteria required to obtain the Food Friendly Orange Flag. The responses provide insights into the current status of the hotels and their progress toward fulfilling these requirements.

Several chefs indicated that their hotels have already met the necessary criteria and are currently in the application process (P1, P9, P15, P19). Others reported that, while their hotels have not yet fulfilled all the criteria, efforts are actively underway to achieve compliance (P2, P3, P5, P6, P7, P10, P12, P13, P14, P17, P18). Additionally, some chefs acknowledged that they were unfamiliar with the exact criteria, but expressed a willingness to assess their hotel's practices once they became more informed (P4, P8, P11, P16, P20).

Selected views from participants on this topic are presented below:

P5: "Yes, our hotel meets the required criteria and successfully implements the necessary practices."

P19: "Yes, our hotel complies with these criteria, and we are currently in the application process."

P7: "We haven't fully met the criteria yet, but we are actively making progress."

P4: "I'm not entirely sure what the exact criteria are, but we can evaluate them once we begin the implementation process."

Orange Flag Application Plans of Hotels

Most hotels indicated that they are planning to apply for the Food Friendly Orange Flag. Several hotels are nearing the completion of their application process and expect to finalize it shortly (P1, P3, P9, P12, P15, P19). Others plan to apply once they have met the necessary criteria and completed their preparations (P1, P2, P3, P5, P6, P10, P12, P13, P14, P18).

Additionally, some hotels mentioned that they would discuss the possibility of applying with their management teams and consider submitting an application after gaining a clearer understanding of the criteria (P4, P5, P8, P11, P13, P16, P20). Overall, most hotels are actively preparing for the Orange Flag application process.

Selected views from participants on this topic are presented below:

P12: "Yes, we are planning to apply and are close to completing our preparations."

P4: "Once we have more information, we will discuss it with the management and consider submitting an application."

P14: "We plan to apply after completing the necessary arrangements."

Measures to Reduce Food Waste in Hotels

Hotels employ a variety of strategies to reduce food waste, as highlighted by the participating chefs. Commonly implemented measures include reducing portion sizes (P1, P3, P4, P5, P6, P7, P8, P9, P10, P11, P12, P13, P14, P15, P16, P17, P18, P19, P20), raising guest awareness (P1, P3, P10, P12, P18), and providing staff training (P1, P2, P5, P9, P10, P13, P15, P18, P19).

To minimize waste, portion sizes are reduced in open buffets and other areas where food is served. Efforts to raise guest awareness include distributing informational brochures and directly educating guests about food waste reduction. Additionally, regular staff training sessions are conducted to reinforce proper practices, aiming to minimize waste throughout the hotel's operations.

The utilization of leftover food in various ways is another important strategy for reducing food waste. Additionally, ensuring proper storage conditions helps prevent spoilage by maintaining food quality and safety. Hotels also focus on using fresh and seasonal products, which contributes to reducing waste by promoting the use of ingredients with longer shelf lives and better quality.

Regular monitoring and analysis of food waste allow hotels to identify the primary sources of waste and implement targeted measures to address them. Portion control is actively practiced at open buffets, where smaller portions

are served to guests, helping to minimize overconsumption and reduce waste.

These measures represent a general overview of the efforts undertaken to minimize food waste in hotels. Through these strategies, chefs aim to reduce waste while promoting sustainable kitchen management. The following are selected views from participants on this topic:

P6: "We implement measures such as staff training programs, portion control, and the utilization of leftovers."

P18: "We focus on reducing portions at buffets, distributing awareness-raising brochures to guests, and providing staff training."

P12: "To minimize food waste, we reduce portion sizes, inform guests, and regularly monitor food waste levels."

P8: "We take steps such as proper food storage, utilizing leftovers, and controlling portion sizes."

Challenges in Preventing Food Waste

Hotels encounter several challenges in their efforts to prevent food waste. One of the most significant issues is guests leaving excessive amounts of food on their plates and the preparation of surplus food due to inaccurate guest number estimations (P1, P9, P15, P19). Another common problem is guests serving themselves overly large portions, particularly at buffets, which leads to increased waste (P2, P6, P8, P14, P16, P20).

Additionally, the shortage of trained staff poses a critical challenge, as it affects the implementation of effective food waste reduction strategies (P2, P7, P17). These factors collectively hinder hotels' efforts to minimize food waste and highlight areas that require targeted interventions.

Several additional factors contribute to increased food waste in hotels. One significant issue is the eating habits of guests and their tendency to consume excessive amounts of food (P3, P5, P10, P12, P13, P18). A lack of staff awareness regarding food waste prevention further exacerbates the problem (P4, P8, P11, P16, P20). Moreover, uncertainties in the supply chain—such as inconsistent deliveries or fluctuating ingredient quality—pose additional challenges (P3, P4, P5, P10, P11, P12, P13, P18).

In particular, unconscious consumption habits among guests and inefficiencies in supply processes significantly undermine hotels' efforts to reduce food waste. Addressing these issues is essential for implementing more effective and sustainable waste reduction strategies.

In conclusion, while hotels implement various measures to reduce food waste, several challenges continue to hinder these efforts. Key obstacles include guests' consumption habits, insufficient staff training, and issues within the supply chain. These factors collectively undermine the effectiveness of food waste reduction strategies.

The following are selected views from participants on these challenges:

P4: "The biggest challenge is that guests take too much food, and the staff lacks sufficient awareness about this issue. Additionally, difficulties in procurement processes contribute to the problem."

P7: "Our main challenges are the overconsumption of food by guests and the difficulty in finding adequately trained staff."

P19: "Guests leaving excessive amounts of food on their plates and inaccurate guest number estimations are among the biggest challenges we face."

P13: "The unconscious consumption habits of guests and uncertainties in the supply chain are our most significant challenges."

Based on interviews with 20 hotel kitchen chefs in Muğla, the majority of chefs reported being aware of the Orange Flag Practice and acknowledged that the initiative encourages efforts to reduce food waste. However, some chefs indicated that they were unfamiliar with the practice but expressed an intention to conduct further research on the topic.

Most chefs stated that the Orange Flag rules are largely followed in their hotels, though some noted that certain areas still require improvement. While many hotels plan to apply for the Orange Flag after meeting the necessary criteria, others are waiting to gain a clearer understanding of the application requirements.

To reduce food waste, hotels are implementing various strategies, including portion control, guest awareness campaigns, and staff training. Despite these efforts, significant challenges persist, such as guests leaving excessive food on their plates and ongoing supply chain issues, which hinder the effectiveness of food waste reduction initiatives.

6. Conclusion and Recommendations

Food waste in the hospitality industry remains a significant global concern, especially within hotel businesses that operate under all-inclusive and buffet service models. This study aimed to investigate the underlying causes of food waste in hotel operations and to explore potential solutions, with a focus on factors such as consumer behavior, staff practices, and operational inefficiencies.

The findings of this study align with previous research, which highlights that open buffet services significantly contribute to food waste due to both overproduction and overconsumption. For example, Juvan et al. (2018) found that buffet-style hotel services led to increased food waste, particularly during breakfast hours, when guests often overfill their plates, resulting in higher levels of plate waste. Similarly, Chang et al. (2022) reported that buffet restaurants frequently fail to implement effective portion control measures, leading to excessive leftovers.

A key finding of this study is that hotels operating under the all-inclusive model typically prepare approximately 15% more food than the actual number of guests to maintain customer satisfaction and offer a wide variety of options. This practice aligns with the findings of Antonschmidt & Lund-Durlacher (2021), who highlighted that overproduction in the hospitality sector is often driven by the desire to meet guest expectations. However, this overproduction frequently results in substantial amounts of uneaten food, leading to significant environmental and financial losses.

The study also revealed that 13% of food waste occurs during the production phase, primarily due to improper cooking techniques and staff inexperience, while an additional 20% of waste takes place after consumption. These findings align with Reynolds et al. (2019), who emphasized that inefficiencies in food preparation and inadequate staff training are significant contributors to pre-consumer food waste in hotel kitchens.

Moreover, consumer behavior plays a critical role in contributing to post-consumer food waste. The concept of "buffet mentality"—where guests overfill their plates to maximize value—was emphasized by Casonato et al. (2023), who argued that the perception of abundance in buffet settings leads to unconscious overconsumption and increased plate waste. The findings of this study support this perspective, as guests were frequently observed serving themselves more food than they could consume, resulting in significant levels of post-consumer waste.

To address the challenges of food waste in the hospitality sector, several key recommendations are proposed:

- **Portion Control in Buffet Settings:**

Hotels should implement strategies to better control portion sizes in buffet services. Chang et al. (2022) suggest using smaller serving utensils and encouraging guests to take modest portions, with the option to return for additional servings. This approach helps reduce initial plate waste while still maintaining guest satisfaction.

- **Menu Design for Reusability:**

Designing menus that include dishes that can be safely reused or repurposed if not consumed is another effective strategy. Bhattacharya et al. (2021) recommend incorporating flexible menu options that reduce waste while ensuring food safety.

- **Raising Guest Awareness:**

Educating guests about food waste is crucial. Antonschmidt & Lund-Durlacher (2021) demonstrate that simple interventions—such as informative signage about the environmental impact of food waste or reward systems for guests who minimize waste—can significantly reduce plate waste.

- **Staff Training on Sustainable Practices:**

Providing kitchen staff with regular training on sustainable food preparation can reduce pre-consumer waste. Reynolds

et al. (2019) advocate for ongoing sessions focused on inventory management, proper storage, and cooking techniques that minimize food loss.

- **Food Waste Tracking Systems:**

Implementing food waste tracking systems allows hotels to monitor waste generation in real-time. Juvan et al. (2018) recommend using specialized software that enables chefs to identify critical waste points and adjust production, accordingly, leading to more efficient food use.

- **Policy and Regulatory Support:**

Policymakers should consider establishing regulations that promote or mandate food waste reduction strategies in the hospitality sector. Bhattacharya et al. (2021) propose offering tax incentives to hotels that adopt effective waste management programs, providing both environmental and financial benefits.

- **Food Redistribution Partnerships:**

Collaborating with local charities to redistribute surplus food can significantly reduce the environmental impact of food waste while supporting communities in need. Reynolds et al. (2019) highlight successful case studies where hotels donated unused but safe-to-eat food to food banks, illustrating the social and environmental benefits of such initiatives.

In conclusion, this study adds to the growing body of literature on food waste in the hospitality industry by offering valuable insights into the specific practices contributing to waste in hotel businesses. Effectively addressing food waste requires a holistic approach that combines operational improvements within hotel kitchens with behavioral changes among consumers.

The implementation of targeted strategies, informed by both the findings of this study and existing literature, has the potential to significantly reduce food waste. Such reductions can lead to meaningful environmental, social, and economic benefits, contributing to more sustainable and efficient practices in the hospitality sector.

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INFO PAGE

The role of orange flag application in preventing food waste in tourism enterprises

Abstract

Food waste remains a significant global challenge, leading to profound environmental and economic consequences. This study explores food waste levels in hotel establishments and evaluates the impact of the Food Friendly Orange Flag initiative in promoting sustainable practices. Employing a qualitative research approach, the study conducted semi-structured interviews with 20 head chefs from hotels located in the Aegean region of Türkiye, selected to represent a range of hotel sizes and operational scales. The data were analyzed using thematic analysis to identify prevalent patterns and challenges related to food waste management. The findings reveal a high level of awareness among hotel staff regarding the Orange Flag initiative, with many establishments expressing intentions to adopt its guidelines. However, the study identifies key obstacles, including excessive guest food consumption, insufficient portion control, and inefficiencies within the supply chain that exacerbate food waste. Furthermore, gaps in staff training and inconsistent waste monitoring practices were highlighted as areas requiring improvement. The study concludes that structured interventions such as enhanced staff education, improved portion management strategies, and active guest engagement—are essential for reducing food waste in the tourism sector. It also underscores the importance of initiatives like the Food Friendly Orange Flag in fostering sustainable practices, which contribute to both environmental conservation and economic efficiency in hotel operations.

Keywords: Food Waste, Sustainability, Food Security, Hotel Businesses, Food Friendly Orange Flag.

Authors

Full Name	Author contribution roles	Contribution rate
Gülşeli Evliyaoğlu:	Conceptualism, Methodology, Investigation, Resources, Writing - Original Draft, Writing - Review & Editing	40%
Emrah Keskin:	Conceptualism, Validation, Formal Analysis, Data Curation, Writing - Review & Editing, Supervision, Project administration	30%
Ayşe Nevin Sert:	Validation, Data Curation, Writing - Review & Editing, Supervision	30%

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