RESEARCH ARTICLE

Food Waste Management in Hospitality Operations: A Study of 4- and 5-Star Hotels in Konya Province

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ABSTRACT

Food waste is a significant and growing global problem with multiple contributing factors, including food and beverage production in hotel businesses. Therefore, it is important to determine the extent of food waste in hotel businesses for the sustainability of food. This study aims to identify the causes of food waste in hotel businesses, explore strategies to reduce waste, and determine the most common areas, meals, and products where food waste occurs. The research sample is made up of 12 four- and five-star hotels affiliated with the Ministry of Culture and Tourism in Konya province. Semi-structured interviews were used to collect data, and a descriptive analysis method was employed to analyze the obtained information and develop themes. The findings indicate that several factors contribute to food waste, with conscious personnel and regular work having a reducing effect, while unconscious staff and unplanned work increase waste. The study also revealed that the highest amount of waste occurs during evening open buffet meals, with bread products being the most commonly wasted. Based on these results, recommendations are proposed for hotel businesses to prevent food waste, and further research is suggested to explore the topic in greater depth.

Keywords: Waste, Food Loss, Hotels Kitchen, Waste Control

Introduction

The current rise in global food demand is placing significant pressure on agricultural production. In order to eliminate the problems experienced in responding to this demand, it is necessary to benefit from foodstuffs during the production and consumption processes without any loss. It is critical to reduce the food waste rate in order to respond to increasing food demand and to minimize pressure in food production (Halloran et al., 2014; Makov et al., 2020). Due to these being complex issues with multidimensional structures (Thyberg and Tonjes, 2016; Kibler et al., 2018), food waste brings with it social, economic, nutritional, and environmental problems (Lipinski et al., 2013; Halloran et al., 2014; Eriksson et al., 2015; Secondi et al., 2015). As food waste can trigger multiple issues simultaneously, it is widely recognized as a significant problem in numerous studies in the literature (Campoy-Muñoz et al., 2017; Derqui et al., 2018).

Although there are major problems with obesity and hunger in the modern world, more than 30% of food is wasted (Dorward, 2012). Furthermore, roughly one-third of food produced for human consumption is lost or wasted throughout the entire food chain (Bahadur et al., 2016; Shafiee-Jood and Cai, 2016; Dölekoğlu, 2017; Bellemare et al., 2017; Ribeiro et al., 2018). This rate of loss is equivalent to the total food production of Sub-Saharan Africa over a period of five to six years (Dölekoğlu, 2017). This rate means that approximately 1.3 billion tons of food go to landfills annually (Vilariño et al., 2017). While 20% of this waste occurs in the field, 40% is lost during processing and consumption (Gönültaş et al., 2020). These alarming rates of food waste indicate a significant loss of food worldwide (Joardder and Masud, 2019).

Reducing the amount of food waste through the analysis of numerical data is essential for improving food safety and minimizing the negative impact of food systems. In addition, proper management of food consumption is crucial for increasing resource efficiency and meeting the demands of the growing global population (Timmermans et al., 2014; Makov et al., 2020). In this context, the study aims to identify the causes of food waste in hotel businesses, investigate strategies that can decrease or prevent waste, and determine the most common areas, meals, and products where food waste occurs.

Literature Review

Food Waste and Food Loss Concepts

As defined by the Cambridge Dictionary, waste refers to "*Unnecessarily spending money, time, effort, etc., meaning spending, extravagance*" (Cambridge Dictionary, 2023). Food waste can occur because of negligent behavior or a conscious decision (Lipinski et al., 2013). In addition, foods formed as a result of spoilage and food lost with waste are also evaluated within the framework of food waste. Thus, the term "waste" encompasses not only food loss but also food waste (FAO, 2013). Among the related concepts, "food loss" is preferred to refer to losses occurring in the early stages of the value-added chain, while "food waste" is used for losses in the final stages (Betz et al., 2015).

When the literature is examined, it is seen that food losses are defined in different ways. These definitions are given in Table 1.

Table 1. Description Related to Food Loss/Waste

Organization/Author	Year	Description
Kling	1943	Food waste is the destruction or deterioration of food or the use of crops, livestock, and livestock products in a way that yields relatively low human food value.
Food and Agriculture Organization of the United Nations (FAO)	1981	Food waste is all food products destined for human consumption that are discarded, lost, spoiled, or consumed by pests at any stage of the food chain.
Food and Agriculture Organization of the United Nations (FAO)	2013	Food waste is food suitable for human consumption that is discarded (usually at the retail and consumption stages).
United States Department of Agriculture (USDA) (Buzby et al., 2014)	2014	Food waste is a subset of food loss and occurs when no edible item is consumed. Only food that is edible at the time of disposal is considered waste.
World Resources Institute (WRI)	2016	Food loss and waste refers to food removed from the food supply chain and associated inedible portions.

Since there are no distinctive definitions of food loss and food waste (used to cover all losses in the value-added chain in the entire process from farmer to consumer), both terms are considered synonymous in this research (Betz et al., 2015).

Causes of Food Waste

Food waste represents a significant issue on a global scale (Papargyropoulou et al., 2014). The causes of food waste are diverse and complex (Bajželj et al., 2020). Since there are numerous factors that contribute to the formation of food waste, and different regions of the world face varying conditions, food waste occurs at varying rates and amounts (Joardder and Masud, 2019).

Sürücü and Tuna (2019) conducted a study that examined scientific publications from 2011 to 2018, aiming to identify the causes of food losses in the production, processing, and distribution/retail stages. According to the study, the reasons for the food waste that occurs during the processing stage originate with logistics, standards, processing, environment, and human factors. In the distribution/retail stage, the reason for food waste was expressed as five factors: logistics, standards, marketing, management, and human elements. Food waste occurs throughout the entire food chain, and the formation of waste starts at the production stage and ends with consumers (Kling et al., 1943).

Multiple factors influence the formation of food waste, and it varies according to different circumstances and applications (Joardder and Masud, 2019). There is a close relationship between the occurrence of food waste and individual choice and preferences in daily life (Derqui et al., 2018). Other factors that lead to food waste include customers putting more food than they can consume on their plates, large portions, a lack of employee education, and inefficient food preparation (Şahin and Bekar, 2018). The number and size of food items served in restaurants are also positively correlated with food waste (Collison and Colwill, 1986). In line with all data, the causes of food waste in the food and beverage industry can be summarized as follows:

- Portion sizes: Inability to produce standardized portions for everyone in the food and beverage businesses.
- Logistics: Difficulty in estimating the customer rate can lead to overstocking.
- Attitudes: The practice of taking home leftover products from restaurants is not universally accepted.
- Awareness: Awareness of food waste as a serious problem is currently low, but it is increasing with environmental awareness.
- Preferences: School cafeterias often face difficulties in meeting the preferences of their students (Bio Intelligence Service, 2010).

Food Waste in Tourism and Hotel Businesses

Food waste has emerged as a significant issue in many sectors and fields due to its adverse social, economic, and sustainability implications (Williams et al., 2012; Papargyropoulou et al., 2016). Tourism and hotel businesses are among the sectors that are particularly affected (Cakmak and Sevinc, 2018). The growth of tourism opportunities, the expansion of hotel businesses, and the wide range of services provided to guests have contributed to an increase in food waste within the tourism and hotel industry (Pirani and Arafat, 2016; Tekin and İlyasov, 2017).

Hotel businesses' kitchen storage areas are a significant source of waste (Rawal and Takuli, 2021). Buffet-style dining options and excess ingredient use in menus contribute to increased food waste and associated costs (Mackenzie et al., 2011). Food waste in hotel businesses negatively affects the income of the business as well as its environmental impact and public image (Trung and Kumar, 2005).

Preventing food waste in hotel businesses involves three crucial stages: pre-kitchen, kitchen, and post-kitchen. In the pre-kitchen stage, it is essential to forecast demand accurately for the kitchen and take necessary actions accordingly. Effective stock control measures should also be implemented during this stage. At the kitchen stage, the correct use of foodstuffs should be made and encouraged. In the post-kitchen stage, it is important to handle customers on an individual basis and implement measures such as food supplementation and informative activities on food waste based on their specific requests (Tekin and İlyasov, 2017; Filimonau and Delysia, 2019).

Hotel businesses play an important role in determining the rate of food waste, measuring the amount, and classifying and categorizing the waste. In line with these responsibilities, they have the capacity to reduce food waste and effectively manage waste in different areas by improving waste management practices (Filimonau and Delysia, 2019). Despite this, the number of scientific publications focused on food waste management in the hospitality and hotel management sector is insufficient (Bender, 1994). Furthermore, Rawal and Takuli (2021) argue that without adequate attention being paid to food waste management, hotel businesses may continue to be a threat to sustainability. Therefore, it is vital to examine, identify, and prevent food waste in hotel businesses.

Methodology

The main purpose of this study is to examine food waste in hotel businesses and the losses that occur in the production and consumption processes. In this context, data for the study were collected using the semi-structured interview technique, which is a qualitative research method chosen for its suitability in exploring and gaining insights into the research topic (Yıldırım and Şimşek, 2016). The semi-structured interview form used in the research was taken from a study conducted by Sezgin and Ateş (2020).

There are 16 hotels with tourism operation certificates that are affiliated with the Provincial Directorate of Culture and Tourism in Konya, and these hotels have been classified as four- and five-star accommodations (Konya Provincial Directorate of Culture and Tourism, 2021). The researchers employed the criterion sampling method, which a purposeful sampling method. The main criterion in forming the sample was that the institutions were implementing practices to reduce food waste. It was determined that all hotel businesses in the universe determined by preliminary interviews were engaged in waste prevention activities. For this reason, an appointment was requested to ensure that the entire research population was interviewed. However, three hotel businesses declined the interview request due to management restrictions, while one hotel business could not accommodate the request due to their busy schedule. Therefore, interviews were conducted with the kitchen chefs of 12 four- and five-star hotels in the research sample.

The researchers conducted the interviews between September 11, and November 14, 2022, with an average duration of 42 minutes per interview. During the interviews, the researchers used a voice recorder to capture the statements of participants, which were later transcribed for analysis. In order to analyze the audio recordings obtained from the interviews and convert the recordings into text, Microsoft Word was used. During the transcription process, repetitive and distorted data were excluded. Once the written text was finalized, electronic notes and opinions of the participants were added to expression tables created in Microsoft Excel for subsequent analysis.

Descriptive analysis was used to analyze the research data and categorize and thematize the questions. Descriptive analysis is a technique that involves summarizing and interpreting data obtained from the research, often quoted from the words of interviewees, and evaluating the results within the framework of cause-effect relationships (Yıldırım and Şimşek, 2016). Three activity steps were followed during data analysis: data reduction, data presentation, and conclusion and validation. During the data reduction stage, the authors analyzed and coded participant statements. Next, they collected expressions with similar codes into categories

using Microsoft Excel. For the presentation of the data, themes were created based on the questions asked of the participants and the categories of their responses.

The authors thoroughly analyzed the dataset before conducting the blind coding process. This coding was cross compared to ensure high reliability and validity. Thus, the objective was to draw a general inference, minimize errors, and ensure accuracy. The selection of data presented in the research was based on criteria such as relevance to the theme, diversity, and extreme value. The findings were then interpreted and discussed within this framework.

This research was conducted with the ethical approval of the Scientific Research and Publication Ethics Committee of Isparta University of Applied Sciences (Board Decision: 08/11/2022-125-01).

Findings

As a result of the analyses, each participant was assigned a unique 'K' code, and their answers to the questions asked are given below. Participants provided more than one answer to the questions. Demographic characteristics obtained as a result of interviews with 12 participants participating in the research are given in Table 2 below. The table includes participant code numbers, gender, age, position in the hotel, and education level.

Table 2. *Demographic Information of Participants*

Code	Age	Gender	Position in Hotel	Education Level	Star Number of the Hotel	Professional Experience
K1	38	Male	Executive Chef	Bachelor's Degree	5 Star	13
K2	48	Male	Executive Chef	High School	5 Star	18
K3	32	Male	Executive Chef	Bachelor's degree	5 Star	11
K4	39	Male	Executive Chef	High School	5 Star	25
K5	37	Male	Executive Chef	Associate degree	5 Star	20
K6	41	Male	Executive Chef	Secondary School	4 Star	20
K7	35	Male	Executive Chef	Secondary School	4 Star	22
K8	35	Male	Executive Chef	High School	4 Star	14
K9	54	Male	Executive Chef	Secondary School	4 Star	30
K10	43	Male	Executive Chef	High School	4 Star	28
K11	44	Male	Executive Chef	Secondary School	4 Star	21
K12	32	Male	Executive Chef	High School	4 Star	13

The primary factors contributing to food waste are unpredictable customer numbers and procurement and use of products without conscious consideration. It was determined that employing conscious personnel influences reducing food waste, while employing unconscious personnel effects increasing food waste. At the same time, it was determined that food wastage also occurs during the production phase due to incorrect cooking and cutting techniques. Uninformed personnel were identified as the main cause of food waste among kitchen workers. It was determined that food waste is mostly experienced in the open buffet and occurs during the evening meal. The food groups with the highest food waste were bread, salad ingredients, milk and dairy products, and sea food and meat products. Among the sample group, only three enterprises gave the answer of red meat, two enterprises gave the answer of bread and cheese, and one enterprise gave the answer of rice. The remaining five businesses did not have any recycling programs. All businesses in the sample group stated that returned products are not evaluated due to health and hygiene concerns and are directly discarded. One business stated that posters were hung regarding the food waste prevention activities carried out by the hotel management, and one business stated that they pay attention to employing trained personnel. The study concludes that none of the 10 hotel businesses surveyed had any written policies or practices to prevent food waste, and only verbal reminders were used to encourage waste reduction.

The question "*What are the factors that cause food waste?*" was asked to the participants, and the answers are shown below. When the data on the factors that cause food waste was examined, the answers were gathered under five different themes (Table 3).

"Too many products are often made because the number of customers is unpredictable. Unfortunately, this is also difficult to predict; we do too much for our customers rather than making less and having insufficient products, in order to avoid having to tell a customer that something is unavailable. This is an effective factor in the formation of waste. At the same time, there is this uncertainty based on customers. When customers make a reservation with us, they specify 100 people and then 50 people come. Production is carried out according to the information given by the customer, but when the specified number is not reached, the products are wasted (K3)."

"The use of grammage is very important in the preparation of some products. While the preparation of a product without using weight increases the amount of material allocated to the product, it increases the waste rate for the product in the kitchen and affects the standard taste and flavor of the recipe. To give an example, in meat dishes, we generally use meat by weight. This not only ensures that the meat ratio in the meat dishes is the same, but also contributes to the ease of control of kitchen expense costs. Otherwise, the per capita meat usage rate becomes disproportionate and causes wastage due to the misuse of the meat product (K6)."

"Unfortunately, our people do not have a restaurant and hotel culture. They try to take from every dish because they are paying for the service. In fact, they are aware that they cannot consume it themselves, but I guess they want to take more because they are paying money. They take so much that there is no space left on their plates. I think customers are getting greedy about it because they take much more than they can eat (K7)."

"I think the main reason for food waste is the purchase of food products, which occurs during delivery and acceptance. If we receive a crushed or aired product, we cannot use this product. This directly causes food waste. For this reason, when receiving food products, the expiry date should be checked, and the quality of the product should be examined. I can explain this with an example. For instance, when purchasing meat for hotel kitchens the meat should not very strong and smelly, these should be checked at the delivery stage. If these are not taken care of, the ground is prepared for food waste (K8)."

Table 3. *Factors Leading to Food Waste*

Question	Theme	n	Participants
What are the factors that cause food waste?	Unpredictable number of customers	4	K1-K3-K5-K6-K11
	Customers take too much food	3	K2-K7-K12
	Irregular operation	1	K4
	Not working by weight	1	K6
	Unconscious product purchase and use	3	K8-K9-K10

The participants were asked the question "*What are the factors causing food waste during production?*" and the answers are shown below. The answers regarding the factors that cause food waste during production are gathered under five different themes (Table 4).

"It is about product quality. If the expiry date of the product has not passed and there is no dent or deterioration in the product, the product is used without wastage. However, if the product is spoiled, dented, or expired, that product causes food waste (K1)."
"It happens mostly due to improper cooking. Even in the simplest pasta making, if the pasta is boiled too much, it disperses in an unattractive way, and we cannot serve it to the customer in this way. Or, when a product that needs to be cooked less is cooked more, its primary appearance and taste changes, and we cannot serve it. This causes wastage (K4)."
"Producing products that need to be prepared by weight without weighing them leads to food waste. It also causes the plates not to be of standard size and quantity (K5)."
"It is caused by the wrong cutting of products. Not peeling the products properly, peeling and chopping the skin of the tomatoes too thickly, when necessary, also creates a lot of waste at these stages. Even the simplest cheese is cut wrong (K11)."
"It is due to the carelessness of the staff. Waste occurs because the personnel do not track the products and do not replace the old product when the new product arrives (K12)."

Table 4. *Factors Causing Food Waste During Production*

Question	Theme	n	Participants
What are the factors causing food waste during production?	Material quality	2	K1-K6
	Wrong cooking method	4	K2-K4-K7-K11
	Wrong cutting techniques	4	K3-K4-K8-K10
	Not working by weight	1	K5
	Careless staff	2	K9-K12

The participants were asked the question "*What are the factors related to food waste caused by kitchen workers?*" and the answers are shown below. The answers regarding the factors that cause food waste from kitchen workers are gathered under three different themes (Table 5).

"There is a lot of waste due to the ignorance of the person working in the kitchen. For example, kitchen staff do not know about cross-contamination, they do not know the colors of the boards and the way the knives are used, so they use the wrong methods when preparing products (K2)."
"It is caused by the carelessness of the staff and their laziness. This causes the product to be removed again while there is a product in the preparation phase, due to carelessness. This allows the second one to be prepared before the existing product runs out. Removing surplus products paves the way for waste (K6)."
"It stems from applying the wrong cutting techniques to the product. For example, instead of mire poix, a cook can chop batonnet (K10)."

Table 5. *Factors Related to Food Waste from Kitchen Workers*

Question	Theme	n	Participants
What are the factors related to food waste caused by kitchen workers?	Carelessness and laziness	4	K1-K4-K6-K12
	Uninformed staff	6	K2-K3-K5-K7-K8-K11
	Wrong cutting techniques	2	K9-K10

The question "*What are the practices that increase or decrease food waste?*" was asked to the participants, and the answers are shown below. The answers that can be evaluated within the framework of practices that increase and decrease food waste are gathered under three different themes (Table 6).

"Unplanned work increases food waste. We see this situation more in trainees. We ask them to 'peel 10 onions,' but they peel more than 10. The products that are chopped more than they need to be darken, change color, and stay in contact with the air for a long time. All of this causes the extra peeled product to be wasted (K4)."

"Conscious personnel are very effective and important in decreasing food waste. Conscious personnel buy the right amount of products; they do not buy too many products and waste them. They do not have any extra items on hand. After all, we are not in a village, we are a city hotel, transportation is easy, and everything is at our fingertips; we can buy enough products and restock them according to the amount of consumption (K9)."

"Having a conscious staff can minimize waste. For example, there is a dinner party preparation for 250 people. If we analyze the cost well during the preparation phase and determine how many grams of food and dessert we will give to each customer accordingly, we will contribute to a great reduction of food waste. At this point, the biggest task falls on the personnel working consciously in the kitchen. Otherwise, the products will be prepared unconsciously by an unconscious staff and unfortunately, food will be wasted after the meals are served (K10)."

Table 6. *Practices That Increase or Decrease Food Waste*

Question	Theme	n	Participants
What are the practices that increase or decrease food waste?	Unconscious personnel/ Conscious personnel	9	K1-K2-K3-K6-K7-K8-K9-K10-K11
	Unplanned work/planned work	3	K4-K5-K12

The participants were asked the question "*In which areas does food waste occur the most?*" and the answers are shown below. The data on the areas where food waste occurs most are gathered under three different themes (Table 7).

"It is mostly an open buffet. Since customers take the products themselves, when they are alone with the product, they want to get it all on their plate. They take extra but leave without consuming it (K3)."

"It happens mostly at the breakfast buffet (K4)."

"It happens so much at the buffet. The reasons are that customers take more products than they can consume, and the buffet stays open for a long time. The buffet should not be open more than 2 hours. But nowadays, when there is less staff to work in the kitchen and there is a guest request, the open buffet hours are longer. Extended open buffet hours cause products to deform and accelerate their waste (K5)."

"It mostly occurs during the production phase (K7)."

Table 7. *Areas Where Food Waste Occurs the Most*

Question	Theme	n	Participants
In which areas does food waste occur the most?	Open buffet	10	K1-K2-K3-K4-K5-K6-K9-K10-K11-K12
	Breakfast buffet	2	K4-K8
	Production phase	2	K7-K8

The participants were asked the question "*Which meal has the most food waste?*" and the answers are shown below. Data on meals with the highest amount of food wastage were collected under three different themes (Table 8).

"Often lot of food is wasted in the evening meal. People often have snacks for lunch. Therefore, at dinner they get hungrier and take more than they can consume. Then they cannot eat it all (K1)."

"The most food waste occurs at the evening meal. People get hungrier because they work and get tired from morning to night. Therefore, they take a lot for a dinner, but they cannot consume it all (K2)."

"It happens in the morning at our hotel. This is because there is not always an evening buffet here (K4)."

"It mostly happens between noon and evening (K5)."

"We have morning and evening services. Among these services, the most food waste occurs in the evening service (K9)."

Table 8. *Meals with the Most Food Waste*

Question	Theme	n	Participants
Which meal has the most food waste?	Morning	2	K4-K12
	Lunch and evening	1	K5
	Evening	9	K1-K2-K3-K6-K7-K8-K9-K10-K11

The participants were asked the question "*What are the food groups where food waste is seen the most?*" and the answers are shown below. The answers regarding the food group where food waste is seen the most are gathered under five different themes (Table 9).

"Food waste is seen mostly in seafood. Fish and seafood have a very high rate of spoilage and poisoning, so they can be wasted quickly (K1)."

"We mostly experience wastage in products prepared from milk and dairy products and meat products. We take advantage of the waste in bread by making breadcrumbs (K2)."

"Salad ingredients are wasted. Waste occurs due to cleaning, such as removing the outer sides of the lettuce, and the low consumption after chopping (K7)."

"It happens a lot in bread products. They take it in pieces, but since they do not finish it, those pieces are wasted (K11)."

Table 9. *Food Groups with the Most Food Waste*

Question	Theme	n	Participants
What are the food groups where food waste is seen the most?	Sea products	1	K1
	Milk and milk products	4	K1-K2-K5-K8
	Meat products	1	K2
	Bread	9	K1-K3-K5-K6-K7-K9-K10-K11-K12
	Salad ingredients	7	K1-K4-K6-K7-K9-K10-K11

The participants were asked the question "*What are the products that are recycled in order to prevent food waste?*" and the answers are shown below. The answers to the recycling methods that can be used to prevent food waste are gathered under five different themes (Table 10).

"We dry the bread that would otherwise be wasted, pass it through the grinder and use it for breaded recipes (K2)."
"We think that it is not suitable in terms of health and hygiene; there is no recycled product (K3-K6-K7-K10-K11)."
"When rice pilaf is not used, we mix it in Yayla soup and prepare it for consumption again (K5)."
"We cool meat and meat products quickly and use them in a different way the next day (K8)."
"We reuse cheese. We recycle it as a cheese patty. If the bread has not been touched, we use it to make breadcrumbs in the kitchen (K12)."

Table 10. *Recyclable Products*

Question	Theme	n	Participants
What are the products that are recycled to prevent food waste?	Red meat	3	K1-K8-K9
	Bread	2	K2-K12
	Cheese	2	K4-K12
	Rice	1	K5
	No recycled products	5	K3-K6-K7-K10-K11

The participants were asked the question "*What are the methods of recycling products returned from customers?*" and the answers are shown below. A theme was created regarding the recycling of products returned from customers (Table 11).

"We do not recycle it for health and hygiene reasons. After all, it is not possible to determine what disease people have from their outward appearance. That is why we do not take any risks. If even a fork touches the product coming directly from the customer, we throw it away (K1-K2-K3-K4-K5-K6-K7-K8-K9-K10-K11-K12)."

Table 11. *Methods of Recycling Products Returned from Customers*

Question	Theme	n	Participants
What are the methods of recycling the products returned from the customers?	Not recycled	12	K1-K2-K3-K4-K5-K6-K7-K8-K9-K10-K11-K12

The participants were asked the question "*What are the activities carried out by the hotel management related to food waste?*" and the answers are shown below. Responses regarding the studies carried out by hotel management on food waste were evaluated and gathered under three different themes (Table 12).

"Management places posters where employees empty customers' plates to reduce food waste (K1)."
"We are paying attention to this issue, and we want our staff to pay attention as well. For this reason, we employ trained personnel in the kitchen staff (K2)."
"To be honest, they only talk about food not being wasted. There is no written warning, etc. other than that (K3-K4-K5-K6-K7-K8-K9-K10-K11)."

Table 12. *Activities Carried Out by Hotel Management Related to Food Waste*

Question	Theme	n	Participants
What are the activities carried out by hotel management related to food waste?	Banners are hung	1	K1
	Employing trained personnel	1	K2
	Verbal expression	10	K3-K4-K5-K6-K7-K8-K9-K10-K11-K12

Discussion and Conclusion

Food and beverage businesses, which are an integral part of the food industry (Ayenigbara and Fadoju, 2020), encompass a wide sector involved in the processing, packaging, and distribution of raw materials, and semi-finished and finished food products (Demir and Istanbullu-Dincer, 2020). Among these factors, the hotel business is a significant contributor to food waste due to its role in food production, preparation, and service. Consequently, identifying and addressing food waste in the hotel industry is crucial for promoting the sustainability of the food system. Upon evaluating the findings of the study, it was determined that several factors contribute to food waste, such as the "unpredictability of customer numbers," "excessive food purchasing by customers" and "unconscious product usage." The plurality of answers suggests that the factors leading to food waste are diverse and interrelated. (Heikkilä et al., 2016; Eriksson et al., 2017). Şahin and Bekar (2018) also found that hotel customers who take more food than they can consume on their plates cause significant amounts of food waste. These findings are consistent with the results of the present study. Notably, the factors leading to food waste are mostly attributed to customers. On the other hand, according to Aamir et al. (2018), the primary causes of food waste in the food and beverage industry are the food left on the plates of the customers, overproduction, and food spoilage. The findings obtained from these studies are in agreement.

Participants reported that conscious staff and regular work practices can help to reduce food waste, while unconscious staff and unplanned work can increase waste. Okumuş (2020) stated that faulty practices caused by the personnel at the food preparation stage cause food waste. Similarly, Parry et al. (2015) identified irregular and unplanned food preparation as a significant factor in food waste generation in the food and beverage industry. These statements are similar to the findings of the study. This study found that improper cooking methods and incorrect cutting techniques during food production also contribute to food waste. It has been stated that the main reason for food waste caused by kitchen workers is the lack of knowledge of the personnel. Sezgin and Ateş (2020) further support these findings by reporting that inadequate food preparation practices during production and a lack of staff knowledge and experience are the primary factors contributing to food waste in hospitality businesses.

It has been determined that the most food waste occurs at the open buffet. Keskin et al. (2019) found that open buffets create a disadvantage for hotel businesses due to the amount of food waste generated. These findings are consistent with the results of this study. The most frequent answer given by the participants to the question of which meal has the most wasted food was "evening," followed by "morning" and "lunch and evening" answers, respectively. According to participant responses regarding the food groups, "Bread" was the most frequently cited item, followed by "Salad ingredients." A study by the Turkish Grain Board (2013) reported that bread wastage is highest in student cafeterias, followed by restaurants, hotels, and similar establishments. Tekiner et al. (2021) also found that bread and vegetable products are among the most commonly wasted items. As such, hotel businesses have a significant role in generating food waste, particularly regarding bread, and implementing various measures to reduce waste in this area is crucial.

When the participants were asked about the recycled products, most of them answered that they do not have recycled products in their hotel. This finding is consistent with the observations made by Cuglin et al. (2017), who noted that recycling is not an integral part of restaurant management systems. However, several businesses reported recycling red meat (three enterprises), cheese (two enterprises), bread (two enterprises), and rice (one enterprise). Although bread is the most wasted product, it is noteworthy that only two businesses recycle bread. Food waste formed in different processes and stages can vary in terms of composition properties. For this reason, although it is not possible to reuse the products themselves, they can be recycled in such a way that they can be added to different foods (Ho and Chu, 2018). None of the businesses reused products returned by customers, as they are deemed unsuitable from a health and hygiene standpoint, which agrees with the findings of Öcal (2021), who reported a lack of recycling in food and beverage businesses due to health and hygiene concerns. Customers prioritize cleanliness and food safety when choosing businesses to visit. Therefore, it is crucial for businesses to prioritize hygiene and provide services in a clean and hygienic environment (Ayenigbara and Fadoju, 2020).

The most frequent answer to the question about activities carried out by hotel management related to food waste was the absence of standardized strategies or written policies, with practices being communicated verbally rather than documented in writing. In this context, it has been determined that hotel businesses do not have specific solution methods for food waste. Hospitality businesses, restaurant operators, and food companies should develop their own methods to combat existing problems and develop solutions (Dilistan-Shipman, 2020). The lack of a clear solution for preventing food waste in the hotel industry is a significant finding. Consequently, several suggestions have been developed based on these results. These recommendations are listed below:

- Similarities and differences can be revealed by conducting research in different businesses (e.g., hospitals, airline companies, and school cafeterias).
- Studies on food waste in hotel businesses should be compiled and analyzed with bibliometric analysis, and different results and suggestions should be compared.
- The lack of standard food waste prevention practices by hotel businesses makes it difficult for hotels to cope with the food

waste situation. For this reason, hotel businesses should adopt, develop, and implement concrete strategies to prevent food waste.

- Incentives such as subsidies or tax deductions should be provided for hotel businesses that implement the right practices to prevent food waste.
- Hotel businesses should employ knowledgeable, qualified, and equipped personnel who know the practices of preventing food waste.
- In order to reduce the food waste rate in relation to the kitchen staff, standard food recipes should be developed, and the staff should be trained on the reuse of food waste in the menus.

Theoretical Contributions

The research focused on analyzing food waste prevention practices in four- and five-star hotels. This study serves as a guide for conducting similar research in other businesses, provinces, and regions, highlighting similarities and differences. The findings of the study are exemplary in terms of determining the principles of food waste management in hotel enterprises. Furthermore, it is crucial to identify food waste prevention practices within establishments, organize training sessions and seminars for staff members, and establish guidelines for both businesses and employees to follow.

Practical Contributions

The main factors that cause food waste in hotel businesses have been identified. In addition, it has been determined that there is more than one factor in the formation of food waste and these factors are interconnected. It has been revealed that wrong cooking methods, the use of wrong cutting techniques, unconscious personnel, and unplanned work during production lead to food waste. The approaches for controlling this situation have been determined. This research conducted in hospitality establishments will raise awareness among employees regarding food waste and provide them with information on the subject. It provides the foundation for businesses to reevaluate the costs associated with food waste and explore new initiatives and practices in this regard. All these findings will help industry professionals to be conscious of the practices that can prevent food waste.

Limitations of the Research

Some limitations arise as qualitative research methods are chosen within the scope of the study. Material and time constraints constitute the primary constraint of the research. The study focused on the opinions of executive chefs working in four- and five-star hotels in Konya between September 11, and November 14, 2022. Furthermore, the study was limited by the fact that it included only 12 male participants.

Future studies should aim to expand the sample size, conduct interviews with a homogeneous group of male and female participants, increase the number of hotel businesses, and be conducted in other provinces to achieve different results.

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