

## Handling Food Waste in The Hotel Industry

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### ABSTRACT

Food waste identified as the leading waste in waste management. It is also a grave issue frequently being discussed not only in Malaysia but on a global basis. Therefore, it is essential to construct proper food waste management strategies to prevent harmful effects on the economy. The main objective is to identify the approaches to handling food waste management in the hotel industry. This study solely relies on secondary data such as journal articles, books, newspaper articles, and electronic databases. In this study, the review focuses on food waste management strategies in the hospitality industry. The researchers used the Google search engine and online databases to collect data. Then, all the information obtained is gathered and discussed based on the objectives and aims to generate a comprehensive understanding by reviewing food waste management strategies in the Malaysian hospitality industry. Thematic analysis is used to analyse all the data collected because it helps the researchers to find a specific scope of study from the various data. This study provides consumers with a better understanding of food waste management strategies in Malaysia.

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**Contribution/Originality:** This study contributed to the existing literature with recommendations the best strategies in handling food waste management. Besides that, this paper reviewing food waste management strategies in the hospitality industry, especially in Malaysia provides the guidelines to food service operators in strategizing food waste management at their premises.

## 1. Introduction

In most advanced democratic countries, the conduct of by-elections is an integral part in Solid Waste Management and Public Cleansing Corporation (SWCorp) claimed that the average amount of food being thrown away by Malaysians was almost up to 17,000 tonnes every day according to the data collected in 2018. Surprisingly, the amount escalated almost 20%, especially during festive seasons. The aforementioned food waste issue in the country has hit a critical level, as SWCorp stated that 55% of solid waste in the landfills was wasted food. The space for landfills has depleted; Malaysia only has 170 waste disposal sites and 14 sanitary landfills that are available. Food waste not only comes from households but also from the hotel industry. [Bhatnagar \(2016\)](#) stated that the increase in hotel occupancy is closely related to the increase in hotel revenues. Thus, the high demand for food which results from the high occupancy is irrefutable.

Hotels serve great and delicious food. However, [Juvan, Grün, and Dolnicar \(2018\)](#) mentioned that the increasing demand for food has contributed to food waste in the hotel industry. Through this sector, almost 12% of food has been wasted for the past few years, which would mostly end up in landfills ([Tostivint et al., 2016](#)). Food waste caused by hotel buffets indicates that hotel food cost is too high and causes unnecessary environmental burdens. Although buffet-style meals improve hotel efficiency directly through visitors' spending, and indirectly through higher satisfaction among guests and the decreased cost of service workers, buffets result in an increase of food cost because more food is consumed but not eaten ([Kuo & Shih, 2016](#)). Consumers prefer to overload their plates at buffets because of the large range and quantity of the food displayed, which are available to them without additional cost ([Kuo & Shih, 2016](#)). This can be seen from a previous study by [Juvan et al. \(2018\)](#), which discovered that the average daily food waste of 15.2 grams per person is due to the food taken from the buffet but not consumed. According to [Mekoth and Thomson \(2018\)](#), guests of different nationalities contribute favourably to food wastage, although differences exist from one nationality to another due to variances in culture. The study implied that wastage is a problematic issue that needs to be controlled from the perspective of guests. Therefore, the role of the hotelier is to ensure that proper food waste handling management is applied. Many adverse effects can contribute towards global development due to food wastage; thus, this effect can only be minimised by enforcing interventions to decrease the amount of food waste produced. The hotel industry needs to implement ideal approaches in handling food waste because the environment will be affected if it is not handled strategically. The hotel industry should apply a sustainable development approach to educate consumers.

According to [Kilibarda \(2020\)](#), the concept of sustainable development has become a foundation for making strategic decisions in the hospitality industry under current market conditions. The World Tourism Organization (UNWTO) noted that visitors' motivations are strongly associated with sustainable development principles. The hotel industry has begun to adjust to the sustainable development concept in line with all these requirements. The industry's strategic plan to protect the environment must be reduced to operational management processes for this concept to be effective. The state should allow hospitality sector organisations, through a legal structure, to use their organisation to promote an environmentally sustainable atmosphere. Considering the sustainability concept, hotel operations must include important elements such as energy efficiency, renewable energy use, and waste management. Waste management, however, has been an unsolved concern for most hotel industry organisations around the world.

Hotels, for instance, are major producers of waste because of their intense business operations. Disposal of waste is a daily issue, particularly in tourist attractions with distinct seasonal characteristics. Food and packaging, such as cardboards and plastics, as well as food with glass packaging, drinks, cleaning, and cosmetic products are the most widely known waste generated by the hospitality industry. The demands are intense for the hospitality industry management, as customers expect satisfaction from food and services. At the same time, the government's requirements for food safety must be upheld, but firms must also be able to anticipate a rise in profit. Therefore, in order to reduce food waste, menu planning and ingredient purchasing are very important. Although appealing to customers, extensive menu options need a high on-hand inventory, preparation, and participation from the workforce (Gunders & Bloom, 2017). Handling mishaps, preparation mistakes, and failures to comply with food safety laws often lead to food contamination, especially with perishable food items. In addition, some restaurant chains dispose discarded food with no concern for wastage because of strict hygiene laws. For example, McDonald's is required to discard unserved fries after seven minutes, and about 10% of fast food is lost in this fashion. However, in comparison to other fast-food concepts, buffet produces a higher amount of waste (Juvan et al., 2018) and it is difficult to donate extra food because of strict health regulations and rules concerning food (Halloran et al., 2014).

Based on the statements above, food waste can pose a substantial impact on the business revenue, public health, and the environment (Wang et al., 2017). Hoteliers need to come up with a strategic way in controlling food waste because it contributes to a major sustainability challenge (Thyberg & Tonjes, 2016). Therefore, this study is conducted to identify the best alternative approaches in managing food waste. Furthermore, from the outcome of this study, hoteliers will have a better view of sustainable food waste management in terms of practice, so that this issue can be reduced from becoming even worse. Thus, the researchers' attention has been drawn to identify the effective strategies to mitigate this problem, since there has been insufficient research that emphasises on food waste disposal management in the hotel industry, especially in the context of Malaysia.

## 2. Research Objective

This study intends to ascertain an effective solution to food waste in the hotel industry. The objectives are as follows:

RO1: To identify the approaches for food waste management in the hotel industry.

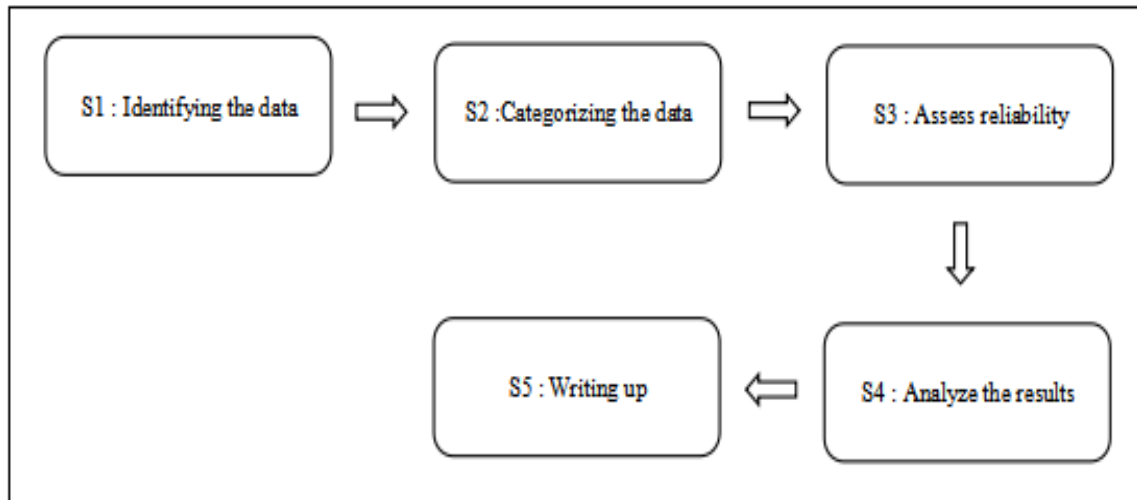
RO2: To identify the best approach for food waste management in the hotel industry.

## 3. Research Methodology

The research design for this project is an argumentative approach which focuses solely on secondary data. The secondary data is sourced from journals, articles, websites, online books, and recorded actions done by Malaysia and other nations in mitigating the food waste problem. On top of that, the researchers address different viewpoints in handling food waste productively, mainly within the hotel industry. To this end, Google search engines and various online database sources are used for data collection. The search and analysis of specific literature are shown in Figure 1. All the information gained and related to the main issue is gathered, described, and analysed according to

the objectives and goals for a broader understanding. Therefore, a critical review can be done on food waste management in the hotel industry, specifically in Malaysia.

Figure 1: Steps in Content Analysis



## 4. Results and Discussion

The discussion corresponds to the study's objectives, as follows:

### 4.1. To identify the approaches for food waste management in the hotel industry

The study's main findings are as shown in [Table 1](#). Seven approaches are commonly used in the hotel industry, namely: prevention from the source; donation to charities; recycling; awareness within organisations; green practices; technology involvement; and promotion of campaigns and programmes. Food waste is not a tolerable issue since the increase of food waste in Malaysia is fairly upsetting year by year, especially during the fasting month of Ramadan. According to an article by [Manikam \(2020\)](#), the percentage of food waste increases every year. However, this percentage focuses on wasted edible food that is thrown away from over-purchasing. Furthermore, this situation mainly occurs in the hospitality industry as it creates more food than other industries. Besides, due to the significance of the greenhouse effect on the atmosphere which causes global warming, the problem of food waste is unquestionably critical. It becomes important for every hotel to find ways to handle food waste and to implement countermeasures. From the findings, seven approaches have been found to be commonly used by the hotel industry for handling food waste.

Table 1: Approaches practiced by hoteliers in food waste management

No.	Approach	Sources
1.	Preventing food waste from the source	<a href="#">Pearson and McBride (2017)</a> ; <a href="#">McAdams et al. (2019)</a> ; <a href="#">Aamir et al. (2018)</a> ; <a href="#">Principato et al. (2018)</a>
2.	Donating unconsumed food to those in need	<a href="#">Jelski (2019)</a> ; <a href="#">Pearson and McBride (2017)</a> ; <a href="#">Christoff (2019)</a>

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3.	Recycling and composting programmes	<a href="#">Wastecare Corporation (n.d.)</a> ; <a href="#">Pearson and McBride (2017)</a> ; <a href="#">Okumus et al. (2020)</a> ; <a href="#">Wang et al. (2018)</a>
4.	Awareness among the organisations	<a href="#">Kasavan, Mohamed, and Abd Halim, (2017)</a>
5.	Green Practices	<a href="#">Deraman et al. (2017)</a> ; <a href="#">Kasavan et al. (2017)</a>
6.	Technology Involvement	<a href="#">Manik and Helfand (2019)</a>
7.	Promoting Campaigns and Programmes	<a href="#">Kasavan et al. (2017)</a>

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#### *4.1.1. Preventing food waste from the source*

Various restaurants and hotels are aware of the need to reduce food waste since it contributes to monetary advantages in the form of food cost reduction, as stated by [Papargyropoulou et al. \(2014\)](#) and [McAdams et al. \(2019\)](#). According to [Pearson and McBride \(2017\)](#), hotels have numerous opportunities along with the flow of food to avoid wastage, which involve prevention during the planning, handling, and serving stages. This approach can be utilised if hoteliers can structure a food waste audit team to track the inventory log and determine how much food is wasted throughout operations. Therefore, restaurants can control wastage by reducing waste from the source, ensuring that meat and vegetables are correctly prepared, forecasting demands, and procuring preparation items efficiently ([Aamir et al., 2018](#); [Principato et al., 2018](#)).

#### *4.1.2. Donating unconsumed food to those in need*

Donating unconsumed food to those in need is another food waste management approach, as supported by [Jelski \(2019\)](#), [Pearson and McBride \(2017\)](#), [Christoff \(2019\)](#), and [It \(2020\)](#). Overproduced food can be allocated as charity to feed those who cannot afford to buy meals, such as the homeless; thus, food needs to be in an edible state. Other than that, with the excess food, this option can also provide the chance to feed animals, such as stray cats and dogs. Although this matter has been supported by previous researchers, the practice cannot be applied at all times because food is still wasted to make way for the surplus food; instead, organisations can try to limit the food to be produced. To make it clear, this strategy is somewhat ineffective in overcoming food waste in the hotel sector.

#### *4.1.3. Recycling and composting programme*

On the other hand, recycling and composting programmes are alternatives that support zero food waste, as highlighted by [Wastecare Corporation \(n.d.\)](#), [Pearson and McBride \(2017\)](#) and [Okumus et al. \(2020\)](#). The inevitable food waste should be recycled whenever possible and segregated from non-food waste, such as usable utensils, to help the efficient recycling of food waste. Food waste segregation is best achieved at the point of production because separation is less efficient once it is combined with general waste. A hotel can establish an organic garden that provides fresh local fruits and vegetables or

run an organic farm (especially duck & chicken) that provides a supply of meat source; thus, waste disposal can be improved by using aerobic composting (Wang et al., 2018).

#### *4.1.4. Awareness among the organisations*

The next approach is for organisations to raise awareness on the importance and role of handling food wastage efficiently by establishing an audit team. The audit team can facilitate food wastage management and reduce food wastage by auditing the food production or procurement, such as assessing the existing levels of food wastage and defining primary sources that create food wastage (Kasavan et al., 2017). Information from the audit team provides the hotel management with valuable knowledge for introducing successful food waste reduction methods. An organisation's awareness can help create a food waste management policy with clear objectives, procedures, and goals, while simultaneously maintaining safety and standard hygiene guidelines. In using this approach for handling food waste, the main focus should be on the situations and actions during production that might have contributed to the food wastage.

#### *4.1.5. Green practices*

The inclusion of green practices is another familiar approach within the hotel industry in dealing with wastage. Green practices facilitate the conservation of water and energy, and the management of solid waste by hoteliers, which will reduce their operating cost and protect the environment. Hotels that initiate green practices are committed in developing programmes that protect the environment. For instance, hotels nowadays provide guests with the option of not changing their bed sheets and towels every day, which ultimately reduces the usage of electricity and water, as well as decreasing the amount of laundry detergent residues deposited into the sewer system. Donating food waste also can be considered a green practice that regulates food waste (Deraman et al., 2017; Kasavan et al., 2017). Therefore, green practices can be considered a general approach that focuses on other waste by-products, rather than a specific approach for handling food waste.

#### *4.1.6. Technology Involvement*

Technology is crucial in minimising the quantity of food waste. Technology involvement is one of the common approaches that has been highlighted in many other studies. In the hotel industry, technology plays an essential role in increasing the precision of any step taken for reducing food waste. For instance, technology such as digital temperature sensors can prevent spoilage, reduce wastage, reduce violations regarding food safety, and eventually reduce considerable cost for hotels (Manik & Helfand, 2019). However, scholars specified that to utilise technology, hoteliers need to invest more. The high cost of technology is unavoidable; yet, due to its ability to reduce mistakes made during preparation, technology ultimately saves cost and reduces food waste.

#### *4.1.7. Promoting Campaigns and Programmes*

Finally, the least supported approach in managing food waste issues in the hotel sector is the option of promoting campaigns and programmes. This approach might assist hoteliers to educate external consumers on the importance of smart spending and grocery planning. Kasavan et al. (2017) recommended that the awareness of waste management can be increased by encouraging more ongoing programmes and

campaigns for all types of hotel operators, guests, and consumers in the local community. However, this approach has not been popular due to its low effectiveness. Nevertheless, this approach is still relevant to the research objective aimed by the researchers, i.e., to identify the food waste management strategies for the hotel industry.

#### **4.2. To identify the best approach for food waste management in the hotel industry**

The second objective is to identify the best approach for food waste management in the hotel industry. As mentioned before, [Papargyropoulou et al. \(2014\)](#) considered food-management prevention as the first and foremost important step in reducing waste. Therefore, the ideal approach to waste management is the prevention from the source, which reduces wastage from the kitchen. Additionally, the approach of preventing food waste at the source has been mentioned by [Pearson and McBride \(2017\)](#), [McAdams et al. \(2019\)](#), [Aamir et al. \(2018\)](#), [Principato et al., 2018](#)), and [Papargyropoulou et al. \(2014\)](#). The scholars agreed that the source is the start of any eventual wastage occurrence. Therefore, monitoring its production stage must be done meticulously. Food wastage is commonly generated in kitchens or known as the Back of House (BoH), which may result from the processes of trimming, peeling, deboning, and packaging, whereas wastage from operations in the Front of House (FoH) may include plate waste. At this stage in the BoH, waste can be controlled by proper preparation from cutting, trimming, and cooking. By following standard procedures, mistakes can be reduced, if not eliminated altogether. Apart from that, it is also advisable to avoid wasting ingredients before the preparation time. This might occur from deteriorating ingredients kept in storage for a long time before usage. The shelf life of perishable products needs to be monitored and ingredients should be replaced over time when necessary. Hence, staff needs to be more cautious with stock arrangements. To ensure that mistakes can be avoided, staff needs to have proper understanding and training on how to handle food. Signs and posters that encourage staff to minimise food waste ([Kilibarda, 2020](#)) around the kitchen can greatly impact the awareness among staff on any wastage being made. This approach needs support from the entire organisation since staff should be aware of issues regarding food waste, which have become increasingly worrying; hence, if no action is taken, operations can become disrupted due to the mismanagement of deteriorated, expired, or spoiled food items. Additionally, reducing the portion size is another way of preventing plate waste. The action itself requires complete awareness from the organisation so that appropriate portion sizes can be determined towards reducing plate waste. Other than that, this approach is cost-effective compared to the approach of applying up-to-date technology involvement due to higher cost ([Deraman et al., 2017](#)). It is easier to train personnel in the organisation along with ample supervision from the top management, as every staff shares the same goal, i.e., to reduce food waste. Since this practice has been asserted by many researchers, it is acknowledged as an effective approach.

#### **5. Conclusion and Recommendation**

This study has inspected the current issues of food waste management toward the environment, and the adverse effects that may occur if no proper action is taken to curb this problem. The hotel sector has been chosen as the area of the study, specifically in Malaysia. The present study has also explored strategies for dealing with issues in food waste management, which might be heavily influenced by many factors, including improper food handling and lack of knowledge on inventory management. The results have shown multiple approaches, namely: preventing food waste at the premises;

donating unconsumed food to those in need; recycling and composting leftovers; raising awareness among the organisation team members; endorsing green practices; utilising technological advancements to manage food waste problem; and promoting campaigns or programmes to educate consumers on the effects of food waste. However, the best approach to realise zero waste attainment is by preventing waste at the source; hence, answering the research questions that have been addressed. All in all, prevention is better than cure.

This study has also encountered some limitations, such as the accuracy of using secondary data for research that might be vague and needed to be cross-examined constantly. Nonetheless, this present study can be extended with the inclusion of primary data collection. By having quantitative and qualitative methods, results study can be further reinforced for better accuracy.

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### Conflict of Interests

The authors reported no conflicts of interest for this work and declare that there is no potential conflict of interest with respect to the research, authorship, or publication of this article.

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