

Food Waste Management in Luxury Hotels—Best Practices and Limitations

Klára Morvay Karakas

Department of Catering, Budapest Business School, Budapest, CEE 1054, Hungary

Abstract: Hospitality industry and hotels are considered to waste a lot of food. This research aims to focus on food waste management in luxury hotels by investigating three luxury hotels in Budapest (Hungary). The investigation focuses on qualitative methods, eleven interviews and observations were made from September to December 2018. Results show that in luxury hotels the main challenge is to ensure the correct balance between 5* experience and minimizing food waste. It was found that kitchen, breakfast open-buffet and staff canteen are among the leading causes of food waste, generating even higher food waste compared to conferences, banquets, or à la carte options. While a broad range of practices exist that are believed to minimize the food waste of buffets, most of the luxury hotels are only implementing a small ratio of such practices and are only in the beginning of the planning phase to expand their practices in this regard.

Key words: Waste management, food waste, luxury hotel, best practices, limitations.

1. Introduction

The FAO (Food and Agricultural Organization) of the United Nations [1] highlighted that food waste principally refers to the diminution of food within the various phases of the food supply chain that eventually decreases the food available for consumption. In fact, food waste is considered to be one of the priority streams for waste prevention on a global scale, due to its substantial and alarming economic, social, and environmental consequences [2]. As stated by FAO [1], more than 30% of the food produced is wasted worldwide amounting to approximately 1.3 billion tons/year. Year 2017 was dedicated to Sustainable Tourism, so more attention is being paid to examining the environmental impact of tourism. The EU (European Union) produces approximately 88 million tons of food waste per year, per capita about 173 kg [3]. Consumers, merchants and caterers account for 70% of this. The UN (United Nation, Sustainability Development Goals 12.3) has set a 50% reduction in waste by 2030. Hospitality industry has been widely

discussed in this regard [4-6], as hotels are among the leaders in food waste generation. This is primarily attributed to the fact that only around 50% of the food in hotel buffets is consumed as hotels tend to overstock their buffets to ensure high level of guest satisfaction with regards to food service [7].

2. Literature Review

Food losses refer to the decrease in edible food mass throughout the part of the supply chain that specifically leads to edible food for human consumption. Food losses take place at production, postharvest and processing stages in the food supply chain [8]. Food losses occurring at the end of the food chain (retail and final consumption) are rather called “food waste”, which relates to retailers’ and consumers’ behavior [9]. Food that was originally meant to human consumption, but which fortuity gets out the human food chain is considered as food loss or waste even if it is then directed to a non-food use (feed, bioenergy etc.).

An FAO [9] study estimated the total of global food loss; as Table 1 shows, industrialized and developing countries differ substantially.

Corresponding author: Klára Morvay Karakas, PhD, associate professor, research fields: sustainability and food waste.

Table 1 Food losses per capita by regions (FAO, 2011, p. 12).

| Country | Food loss and waste per person per year |
|------------------------------------|---|
| North America and Oceania | 110 kg |
| Europe | 90 kg |
| Industrialized Asia | 80 kg |
| North Africa West and Central Asia | 35 kg |
| Latin America | 25 kg |
| South and Southeast Asia | 15 kg |
| Sub-Saharan Africa | 5 kg |

Regarding the Hungarian data annually nearly two million tons of food ends in the trash [10]. Of this, the consumer surplus is about 400,000 tons per year, representing 40 kg of food wasted per person. According to another survey [11], this value is 68 kg/year, which is higher but still lower than the figures in European countries with higher purchasing power. The exact amount of food waste generated in hospitality is unknown, but it is estimated that hotels, restaurants, and the catering sector are responsible for about 12% [12] of the total food waste generated in the European Union, while 14% in Hungary [11].

Considering the hospitality industry, academics have classified food waste by taking different approaches. Baldwin and Shackman [13] claimed that food waste occurs when it is unused by the customer or by an employee of the food service, and therefore, they categorized food waste in the hospitality industry into two major categories:

- Pre-consumer food waste—waste from overproduction, expiration, and trimming;
- Post-consumer food waste—which concerns food rejected by the customer e.g. leftover on plates. At the consumption stage, the term “*plate waste*” is used to describe food served but not eaten. Plate waste consists of edible, inedible and possibly edible food [14].
- Edible food waste—a significant portion of the total food waste [6] could have been eaten but was not [15]. Possible reasons include poor quality, personal preferences, and overestimation of the amount of food one will consume [16].

- Inedible food waste—parts of food that cannot be consumed (e.g., peels, bones, egg shells);
- Possibly edible food—parts that some people eat, and others do not (e.g., potato skins, cartilage, chicken feet).

As hotels worldwide have an increasing awareness on the issue of food waste as well as the negative implications it has on their profit margins; food waste reduction is a key objective nowadays [17]. The issue is commonly approached by reconsidering previous practices and implementing new approaches. In fact, hotels that have been engaged in effective food waste reduction can realize up to 600% return on investment with the implementation of food waste reduction initiatives. This implies that many hotels on a global scale have been considering and/or implementing food waste reduction strategies.

According to Tekin and Ilyasov [14], food waste is unavoidable in the hospitality industry due to the fact that hotels welcome guests with diverse cultures, lifestyles and eating habits on a global scale. In general, tourists consume more food than at home and eat more imported food than at home, thus increasing the tourism related environmental impact on the destinations [18]. Gastronomy and eating are key tourist experiences, likely they try unknown dishes which they may not enjoy once they try it. This leads to more food being wasted on holidays than at home.

Buffets are a form of a meal service where guests typically pick and self-serve food in an all-you-can-eat manner [18]. It is a very popular method of serving food in the hospitality industry and an important part of the service quality in hotels [19]. Buffets mostly contain one or several stations with a variety of dishes completing a full meal courses, such as starters, main courses, deserts, salads, cheeses and fruits. Buffet style meals increase hotel performance directly through guests spending and indirectly through higher guest satisfaction and reduced service staff costs. However, buffets can also increase food service cost because more food is consumed [18] and more food is

Table 2 Best practices focusing on kitchen and open buffet (source: author’s summary).

| Challenge | Best practice (Consumption-related) | Best practice (Staff-related) |
|---|---|---|
| Minimizing food waste at buffet service | Shifting specific items to a la carte 30 min before ending the mealtime | Rewards for those colleagues who accurately and consistently track food waste |
| | Giving leftovers in doggie bags to non-resident a la carte guests | Punishment for those who are not accurate in the separating and tracking |
| | Showing sample plates | Participating in trainings on how to reduce food waste |
| | Using smaller plates | Regular staff meeting on food waste prevention |
| | Serving single portions | Peer learning opportunity |
| | Shrinking the pastry baskets | Eye-catching signage in staff canteen |
| | Asking guests about their food preferences | |
| | Sizing down the portions | |
| Minimizing food waste in the kitchen | Utilizing leftovers as fertilizer in rooftop garden | |
| | “Too good to go” app | |
| | Careful menu planning | Brainstorming on donation possibilities |
| | Separating and weighting kitchen-level waste on a daily basis | Giving culinary team tools and resources to prevent food waste |
| | Utilizaitaion of large-scale technology to more precisely track the waste | Appointing a responsible person |

taken, but not eaten. At buffets, people tend to overload their plates due to the wide variety and abundance of displayed food available to them at no extra costs [18].

Luxury hotels are perceived to generate higher share of food waste as opposed to other hotel types. This can be explained by the fact that luxury hotels aim to fulfil their guests’ expectations in terms of luxury services, which includes offering and serving the greatest abundance of food either through á la carte or open buffet options [20]. Furthermore, staff behaviour at luxury hotels was also found to be a major factor in food waste generation as in case staff has insufficient knowledge and/or involvement, they tend to generate unexpected amount of food waste [13]. Hotels have to prevent food wastage, while allowing using food surplus, should they occur, to engage in donations to people in need, or to re-use leftovers and/or non-edible food waste for other purposes in accordance with the food waste hierarchy [12].

The most commonly mentioned practices in academic papers with regards to food waste prevention include food waste tracking on a daily basis [13]; higher quality ingredient purchasing [15]; smart food merchandising [13]; flexible menu design

through the creation of various use for ingredients [20]; effective staff training to establish a sustainable company culture and raise awareness among staff [13]; and enhanced customer engagement [20]. The most commonly mentioned practices with regards to food waste management comprise donating the leftovers that are in good condition or food closed to expiry date to charity organizations [20]; feeding animals or using it in agricultural production [13]; recycling in case the food cannot be reused [20], or sending the waste to landfills, which is the least desirable alternative.

Table 2 presents a summary of the key challenges and best practices identified with regards to food waste management in luxury hotels.

3. Methodology

This research aims to focus on food waste management in luxury hotels by investigating three luxury hotels in Budapest (Hungary). The name of the hotels will be not indicated upon their request, but all of them include about 200-400 rooms and are parts of different worldwide hotel chains.

The research takes a case study approach by evaluating the current state and effectiveness of the food waste management practices. In the exploratory

stage of the research the investigation focuses on qualitative methods. The primary data collection is based on eleven interviews and observations from September to December 2018. The interviewees were selected only from the level of managers and department heads of the three hotels (GM (General Manager) F&B (Food&Beverages Manager) managers, purchasing, chefs, Chief stewards, Banquet managers, Banquet sales etc.) and the semi-structured interviews gave the opportunity to the participants to talk freely in a set range. The questions focused on the hotel's F&B department attributes, the food waste generation and the food waste management and prevention approaches utilized at the hotel. The questions follow the logic of food preparation process and the steps included in HOTREC (The umbrella Association of Hotels, Restaurants, Pubs and Cafes and similar establishments in Europe) (the umbrella Association of Hotels, Restaurants, Pubs and Cafes and similar establishments in Europe) guidelines for hospitality establishments to reduce food waste. An additional goal is to find out which procedures cannot be applied in luxury hotels and determine those available sustainable practices that fit into the 5-star hotels' atmosphere.

4. Results

According to the interviews each sample hotel follows the requirements of sustainability goals of their brand. They have global policies with very general aims. They cannot adopt renewable energy sources—since they are located in downtown—but pay attention to energy and water usage. Each hotel selectively collects the garbage, but only as much as the legal requirements. Two of them have “green team” and sustainability campaigns to save the extinct animal species and plant trees.

Regarding the results this article focuses on F&B operation and food waste management; the HOTREC guideline's suggestions were followed starting from the menu planning till the waste handling. Each hotel

has mostly MICE clientele, where the ratio of groups is 30%-40%, the rest is individual. The guests served daily are between 600-2,000 depending on the banqueting events. Breakfast is usually for around 400-500 guests, and usually about 50-100 guests for both lunch and dinner, and 250-350 portions of warm food for staff canteen. These are huge numbers. The busiest time of the day is the breakfast everywhere driven by the occupancy of hotels, which is constantly high in Budapest (~75%-82% in the sample hotels, 2019). The second busiest time of the day would be lunches which are driven by the conferences.

4.1 Menu Planning

The seasonality of the menu is a key aspect. Hotels try to offer an interesting range of food, as tourists are expecting local experiences, but also worldly classics. As part of a brand, specific standard items must appear on the menu. The hotels evaluate what menu element is running and try to eliminate the less popular ones, because that obviously does not bring money, and these ingredients could go to wastage, and this is something they try to avoid. The hotels have one menu for the whole year for room service. Additionally, to have the freshest ingredients of the seasons available they promote regularly special seasonal food. This set-up minimizes food waste but also the carbon footprint. Banquet menus also have a certain seasonality as it is very useful to reduce their carbon footprint. It is not easy, but this is also about educating the partners. The menu offer is focused on the needs of the big conference groups, as well as adapting to their price sensitiveness.

4.2 Purchasing

Each hotel contracted with approximate 40 suppliers of the kitchens, with 3 or 4 being foreigner directly. It shows that managers try to favour Hungarian and local suppliers. They buy local poultry and lamb because those are good quality products in Hungary. It is a pity they must order all other meats

from abroad to serve the required high quality for the guests. At the same time, besides regular vegetables, micro vegetables, such as sprouts are also purchased from local suppliers. These local, organic products are usually more expensive and there are some ingredients that cannot be found in Hungary in the required quality or quantity. Due to French & Hungarian cuisine some cheeses and fish of the menu are only available in France. As a result, the farthest location of direct suppliers is in Paris that deports ingredients from the Rungis International Market. Usually one hotel orders fish from there that cannot be found in Hungary. Since the watermelon is a standard in one of the hotels, they order it from Brasil in winter season. Still, there are many products which have a Hungarian distributor, but the product is made abroad. Regarding alcoholic drinks, many spirits come from abroad through a Hungarian distributor. Due to the luxurious service it is not possible to have a scarcity of any types of beverages that the guest may desire. Fortunately, the domestic wines are in great quality.

Minimizing the waste of packages there were many successful but unfeasible attempts to order or offer products in larger portions for guests. As an example, hotels offered sauces in small plastic packages that created tons of waste. Fortunately, they could change this habit by offering served portions of sauces in small ceramic dishes that can be washed after use. Another good example is the change from small paper and plastic packaged cereals to a larger portion in glass containers. However, they also tried to offer sugar for coffee breaks in a bowl with sugar clamps, but guests were using their own spoons to take out sugar from the bowl. Thereupon, for hygienic purposes, they had to return to sugars in small plastic bags that cannot be contaminated. In case of the small glass containers of honey and jams the culinary culture does not allow changing for any other portion. According to the managers, because of the luxurious needs, guest would not tolerate the “mega portions” of them.

4.3 Food Production

The research has shown that the kitchen, the buffet (breakfast) service and staff canteen are the most wasteful activities. Thanks to the dedicated culinary teams and high-quality kitchen procedures the following mistakes very rarely occur:

- deterioration of raw materials in the warehouse—the FIFO (First in-First out) and FEFO (First Expire-First out) principle is applied, the expiration and “best before” dates are regularly checked;
- faulty cooking technology—too long cooking time, bad seasoning;
- returned food due to any problem—hair in the food; the quality or consistency of the food does not meet the expectations.
- There are some “failures” which contribute to higher food loss and waste:
 - high preparation loss—only the best parts of meat or the perfect shape fruits are allowed to be used;
 - overproduction—in case of cancellation, insufficient guest information; high guest expectation;
 - kitchen defects—the casual workers are careless, dropping or breaking the pots.

4.4 Breakfast

Breakfast is considered to be the most important meal in the hotels usually between 6:30 and 10:30. All of them provide a great variety of bakery, meat, cheese, salad, fruit and diary products in a nice layout. The last guest must be served in the same way as the first one which makes waste management difficult. Management believes that guests require the wealthy feeling, to have abundance quantity of everything on the table. The most frequently wasted food products are bakery products, especially toast bread. Approximately 20% of the served pastries comes back to the kitchen. Information about the distribution of guests (by nation) can help to serve the proper amount of pastries, i.e. Italians consume more, whilst Asians eat less bakery products.

Finishing breakfast only the fresh fruits, the closed containers (e.g. yoghurts) can be reused which are packaged separately, and the rest are wastage. In case of room service, fruits remaining on plates must be thrown to garbage, even if those are untouched (concerning one of the examined brand's standards).

4.5 Events

For banqueting the amount of food waste during the preparations is very low, almost nothing, as hotels have all the necessary information in advance. The goal is to know as much from guests' preferences as possible. The problem occurs if the participant number is less than the forecast and since these events usually are buffets, the amount of food waste is determined by the guests. If the Chefs do not have proper information, they usually prepare 65% of every item. Therefore, if the whole menu is divided into 3 parts; the first one is set on the tables at the beginning, so it probably will be consumed. The luxury hotels' policy determines that guest cannot see scarcity, so if half of the meals is gone servers should change the plates to the "second part", which is maybe consumed but generally 50%-60% of the last third will remain untouched. Nevertheless, it cannot be predicted that which items remain at the end because the desires always differ.

Some years ago, in one of the examined hotels many recycled products were purchased for banqueting, i.e. pens, paper blocks and the kitchen also has implemented some meals to the package. Unfortunately, guests did not choose these services at all, even though there were many PR (Public Relation) activities for promotion and the prices were the same with the regular products, guests did not feel convenient to use recycled products.

4.6 Staff Canteen

For leftovers that have not reached the guest area yet, it is possible to reuse in the staff canteen. If the food reached the guest area, then they have to treat it

as hazard and it becomes food waste. So, in case of a big event, 10-30 kg of food waste occurs, while a la carte does not produce extensive amount of loss.

Staff canteen has a great food consumption in two of the examined hotels, where about 20-30 kg of food waste is generated daily, as well as about the same amount is not used. Each hotel employs outsourced staff, which greatly affects how much they care about wasting.

4.7 Leftover

Apart from those food items that the guest or employee does not eat, there are many unused parts of the ingredients. For instance, the crust, peel and shell land in the bin. The pieces after delicate cuttings (dice, julienne) are mostly utilized. As an example, vegetable edges are used for vegetable soup base or sauces, remaining parts of meats and fish are also used for the same purpose. Based on the Chef's answers these soup bases and sauces are used and consumed every day. Still, some edible parts of the ingredients may be thrown away, when there is no time for the careful cutting, e.g. to save the fruit around the stalk. Due to the luxurious standards some techniques also generate food waste. Due to the delicate cuttings, a big portion of the expensive ingredient is unused, therefore, they try to create more meals that can utilize them. For instance, the leftover of the nicely diced potatoes can be utilized for mashed potatoes; the leftover of the same slices of Foie Gras is used for Pâté de Foie Gras. Even though to prepare breadcrumbs for guests, cooks bake their own bread and only use the inside of it.

Two of the sample hotels measure the consumption and the wastage and analyse data. The system measures the amount of wastage at each step of the food production and sends a report to the chef on a daily basis while offering solutions for better applications. Examining the database (one year in case of 2 hotels and two years in the third one) does not indicate the food waste in general is being reduced,

rather seasonality and effects of great events can be observed. Food waste primarily depends on culture of the guests, and their level of awareness on the issue. Regarding staff the hotels consistently attempt to make them aware of food waste. Only one of them launched a reward program for the staff, if they eat all food from their plate, they get an ice cream. This program drastically reduced the amount of food waste, but only for one week...

Around 200-300 kg of food waste is produced in each hotel daily, which is already filtered, and does not include liquids, only solid waste, which is then transported and annihilated. The green waste—including fruit and vegetable leftovers which can be used as a biomass—could be transported separately, however unfortunately in Hungary, there is no company that is concerned with this issue; therefore, these end up in the communal or organic waste. The organic food waste—formerly donated or sold to farmers or shelters—must be transported on trucks by a contracted company; hotels pay for this service. The used cooking oil is collected and transported separately, and all other organic waste removal causes high costs. Even though it is totally edible, the hotels cannot take the risk of giving leftover to the people in need, not to mention the logistics difficulties (who would serve the food, how to transport it etc.), and the problems of health safety and HACCP (Hazard Analysis and Critical Control Points) regulations.

5. Conclusion

This research focused on the implications of food waste management in luxury hotels through the case study of three high-quality hotels in Budapest. The examined properties are business hotels located in the city centre of Budapest having limited options to “go

green” compared to those luxury hotels located in natural sites.

Focusing on food waste management, research shows that the hotels are aware of the importance of the topic, however, do not show efficient proactivity.

In luxury hotels the main challenge is to ensure the correct balance between 5* experience and minimize food waste.

It was found that kitchen (preparation, overproduction), breakfast (open-buffet) and staff canteen (careless behaviour) are among the leading causes of food waste, generating even higher food waste compared to conferences, banquets, or á la carte options. The limitation in terms of food waste includes the barriers in donation, the guests' behaviour and the recycling. It seems that disposing is cheaper than re-using and donating. The interviewees highlighted the issues that edible leftovers cannot be given to people in need due to health safety reasons and transportation difficulties. There is lack of state-supported handling of green waste and the regulations are inexplicably strict. It was also highlighted that guests do not care a lot about the environment and do not want to step out of their comfortable zone of luxury. However, it seems to be the easiest to engage hotel guests and staff. It has become clear that 5* hotels must comply with the brand standards and not be able to implement all of the practices to reduce food waste (Table 3).

Although sustainability goals exist in each of the examined hotels, there is no adequate background for food waste management. While a broad range of practices exist that are believed to minimize the food waste, most of the luxury hotels are only implementing a small ratio of such practices and are only in the beginning of the planning phase to expand their practices in this regard.

Table 3 Food waste management solutions that are used in the examined hotels and those that cannot be used due to the high quality (source: author's summary).

| Applied solution to avoid food waste | Not applied solution with respect on 5* quality |
|---|---|
| Menu planning | |
| Regular menu assessment and actualization | Smaller portions |
| Less dishes on the menu (room service, banquet) | Special offers for children |
| FIFO, FEFO | Sample plates |
| Attention to seasonal ingredients | |
| Purchasing and storing | |
| Favor local distributors | Ordering all raw materials from the nearest supplier |
| Order the precise form and shape and quality products | Ignoring far-reaching special ingredients and drinks |
| Accurate forecast of the number of expected guests | Acceptance of non-perfect ingredients (fruit, vegetable) |
| Deep freezing and Cook&Chilled technics | Avoid pre-production |
| Under-vacuum storage | Small individually packed product |
| Respected hygiene norms and regulations | |
| Labelling of stocks/inventory | |
| Food preparation | |
| Good mise-en-place in kitchen and service | Avoid unnecessary trimmings |
| Different cooking techniques for the same ingredient | |
| Use leftovers for preparing bouillon, soups, sause, mashies | |
| Communication with guests and staff | |
| Dialogue with customers to check their expectations | Force guests to behave responsibly |
| Offer doggy bags or food-boxes to a'la carte guests | Do not fill the chaffings on buffet 30 min before end |
| Flexibility on guests' special requests and sensitivity | Explain to the guests the limited choice (to avoid losses) |
| Train the staff on sustainability | Offer doggy bags or food-boxes to all inclusive (buffet) guests |
| Launch reward programs for staff | Warn guests not to take more on their plates |
| After service | |
| Use products in staff canteen which are close to their expiry | Use dishes staying longer than 3 h on the buffet |
| Use unsold products in staff cantine which are still safe | Donate edible food products to food banks or charitable organisations |
| Rewarm the unsold bread in staff canteen | Use edible food for animal feed |
| Separate organic waste and used cooking oil | Compost the organic waste |

References

- [1] FAO. 2018. *Food Loss and Food Waste*. Accessed November 1, 2018. <http://www.fao.org/food-loss-and-food-waste/en/>.
- [2] Stenmarck, Å., Jensen, C., Quedsted, T., and Moates, G. 2017. *Estimates of European Food Waste Levels*. Accessed October 18, 2017. <http://www.eu-usions.org/phocadownload/Publications/Estimates%20of%20European%20food%20waste%20levels.pdf>.
- [3] Foodbank. 2016. *Európában 88 millió tonna az élelmiszer pazarlás frissen becsült mértéke*. Hungarian Foodbank Association. Accessed October 11, 2017. http://www.elelmiszerbank.hu/hu/hirek/hireink/sajtokozlemeny_europaban_88millio_tonna_az_elelmiszerpazarlas_frissen_becsult_merteke.html#.WdpUJmi0NPY. (in Hungarian)
- [4] Legrand, W., Sloan, P., and Chen, J. S. 2016. *Sustainability in the Hospitality Industry*. New York: Taylor & Francis.
- [5] Lephilbert, B. 2016. *Food Waste the Elephant in the Room for the Hospitality Industry*. Accessed November 1, 2018. https://www.sustainablebrands.com/news_and_views/waste_not/benjamin_lephilbert/food_waste_elephant_room_hospitality_industry.
- [6] NÉBIH. 2017. *Maradék nélkül program—kutatási eredmények összefoglalása*. Accessed November 1, 2018. <http://portal.nebih.gov.hu/-/maradek-nelkul-program-kutasi-eredmenyek-osszefoglalasa>.
- [7] EPA. 2010. *National Waste Characterization Report*. Accessed November 1, 2018. http://www.epa.ie/pubs/reports/waste/wastecharacterisation/3rd_Bin_Commercial_Waste_Characterisation_2010.pdf.
- [8] Riley, G. L. 2016. *Food Waste: Practices, Management and Challenges*. New York: Nova Science Publishers.

- [9] FAO. 2011. *Global Food Losses and Food Waste—Extent, Causes and Prevention*. Accessed February 12, 2019. <http://www.fao.org/3/mb060e/mb060e.pdf>.
- [10] Tét Platform. 2016. *Élelmiszerpazarlás és környezetterhelés*. Accessed October 17, 2017 <http://tetplatform.hu/elelmiszerpazarlas-es-kornyezetterhelés/>. (in Hungarian)
- [11] Parfitt, J., Barthel, M., and MacNaughton, S. 2010. “Food Waste within Food Supply Chains: Quantification and Potential for Change to 2050.” *Philosophical Transactions of the Royal Society* 365: 3065-81.
- [12] HOTREC. 2017. *European Hospitality Industry Guidelines to Reduce Food Waste and Recommendations Manage Food Donations*. Accessed June 3, 2018. <https://www.hotrec.eu/wp-content/customer-area/storage/21a961c993e5f7814dcb7c30d425cb95/HOTREC-guidelines-onfood-waste-reduction-and-recommendations-to-manage-food-donations-19January-2017.pdf>.
- [13] Baldwin, C. J., and Shackman, A. 2012. *Food Waste Management in Greening Food and Beverage Service*. Washington D.C.: Green Seal Inc.
- [14] Tekin, O. A., and Ilyasov, A. 2017. “The Food Waste in Five-Star Hotels: A Study on Turkish Guests’ Attitudes.” *Journal of Tourism and Gastronomy Studies* 8 (1): 13-31. doi: 10.21325/jotags.2017.81.
- [15] WRAP. 2013. *Overview of Waste in the Hospitality and Food Service Sector*. Accessed March 1, 2018. <http://www.wrap.org.uk/sites/files/wrap/Overview%20of%20Waste%20in%20the%20UK%20Hospitality%20and%20Food%20Service%20Sector%20FINAL.pdf>
- [16] Cox, J., and Downing, P. 2007. *Food Behavior Consumer Research: Quantitative Phase*. Accessed May 5, 2018. <http://www.wrap.org.uk/sites/files/wrap/Food%20behaviour%20consumer%20research%20quantitative%20jun%202007.pdf>.
- [17] Troitino, C. 2017. *The Tragedy of the Buffet Commons: Reducing Food Waste at Hotels*. Accessed November 1, 2018. <https://www.forbes.com/sites/christinatroitino/2017/09/14/the-tragedy-of-the-buffetcommons-reducing-food-waste-at-hotels/#6558c20b17dc>.
- [18] Juvan, E., Grün, B., and Dolnicar, S. 2017. “Biting off More Than They Can Chew: Food Waste at Hotel Breakfast Buffets.” *Journal of Travel Research* 57 (2): 232-42. Accessed November 19, 2018. https://espace.library.uq.edu.au/data/UQ_418898/post_print_JTR_bite_more_share.pdf?Expires=1557051953&Signature=Q8qgnK9O3ZNIpYHelRkKLS4XzIja4N7UmFVC Lb12SdeboqdNDAnUmnCiYG3Om4Y1BFUtTTs7NGjA gpWb83XAS0BU-c1M7MqYJpU-AVfczBDX-xtUUXbi-9l7G75MGfhdZY8gW9YKRBnR62n1~K3Fg-S5i0AWK79fh2bGWSls5Gs6x-6lkh00iHiuykYiYBJuECKE6mjf0l bifcglBBdSJ3P5R-9Xee-3LEqIXZ71S0RMBdOMWAqZ MVPcW-4~LJG-hGhagnbG9AzmU02Bku9mwpYLR-Jq0kOmLs~q97eu7Eep7qPsmnL~0K0wK5al9kZiQdhErZa goLDBw9sWnQXZkw__&Key-Pair-Id=APKAJKNB4 MJBNC6NLQ.
- [19] Wilkins, H., Merrilees, B., and Herington, C. 2007. “Towards an Understanding of Total Service Quality in Hotels.” *Hospitality Management* 26 (4): 840-53.
- [20] Linh, N. K. 2018. “Food Waste Management in the Hospitality Industry: Case Study: Clarion Hotel Helsinki.” PhD thesis, HaagaHelia University of Applied Sciences.