# Assessment of Food Wastage at Preparation Stage in Food and Beverage Units of Hotels in Rivers State, Nigeria

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***Abstract***
*The purpose of the study was to assess food wastage at preparation in food and beverage of hotels in Rivers State, Nigeria. The study was guided by (3) specific objective and descriptive survey research design was adopted for the study. The area of study was Port Harcourt, Rivers State, Nigeria. Population of the study was one thousand and fifty three (1,053) staff of 351 registered hotels with the Rivers State Ministry of Culture and Tourism. The sample size of 105 which is approximately 10% of the population was used. Purposive and convenience sampling techniques were used to obtain the samples. Questionnaire was the instrument used for data collection. The instrument was subjected to validation by three (3) experts. The instrument was determined using Cronbach's Alpha. Data was analyzed using percentage, mean and standard deviation for the research questions at 0.05 level of significance. Result showed that the highest rated food types wasted at preparation stage included: cabbage (94.8%), eggs (91.7) potatoes (91.1%), uziza leaves (78.2%), ukazi leaves (74.8), yam (67.1%), leafy vegetables (pumpkin leaves) (67.1%), and rice (66.5%), among others. Findings for causes of food waste revealed that 14 items were the causes of food waste at preparation stage in food beverage units of hotels. Result showed that the mean score of 3.92 (food discarded should be tracked to identify the areas food waste are generated) was the highest mean value for ways to enhance reduction of food waste at preparation stage in food and beverage unit of hotel. There were significant (p>0.5) difference in the mean responses of the food and beverage managers, store managers and chefs on all the parameters analyzed. The study recommended among others that food discarded should be tracked to identify the areas food waste are generated which will help in reducing waste at preparation stage in food and beverage unit of hotels.*

***Key Word:*** *Preparation stage, Hotel, food waste, food and beverage unit*

## Introduction

Food waste is unconsumed food or food meant or intended for human consumption but was discarded for a variety of reasons. Edizioni (2020), defines food waste as any nutritious or edible foodstuff that is purposefully discarded during the preparation or consumption phases for a number of causes, instead of being meant for human consumption. Nguyen (2018), states that food waste is commonly understood to be food that was thrown away due to inappropriate management, either before or after it was consumed, but is still of acceptable quality. Food and Agricultural Organization-FAO (2016), defined food waste as food that is fit for human consumption but thrown away, regardless of whether it is kept over, its expiration date or allowed to go bad.

According to Wells and Hyman (2014), food that is discarded after being unneeded, such as leftovers from visitors, is known as hospitality food waste. Food waste throughout the world might be attributed to the hospitality industry, it is growing and becoming a challenge in the industry. According to estimates from the FAO, (2017), around 1.3 billion tons of food produced for human use are lost or wasted annually during the production process. This includes food that is prepared, consumed, and sold in restaurants, food service outlets, hotels industry and others.

The hotel industry is an industry that is fast-growing in the world, contributing 10% of the global GDP and making a healthy profit each year. The more effectively the hotel sector provides services, the more money the government makes from them. Nigeria has reaped enormous benefits, particularly from the recent expansion of the hotel industry, which has given rise to several hotels in different states, including Rivers State. Some of the hotels found in big cities such as Port Harcourt are boost with reasonably high quality of service both in facilities, food and drinks, entertainment experienced and others. The food and beverage unit in every hotel is known as F&B department, a service department that engages itself in the provision of food and beverages, mainly to the people who are away from home for different reasons. According to Mercedes (2019), Food and beverage unit or department is considered to be the largest and the second most revenue-generating operational area in the hospitality industry, the food and F&B unit vary according to hotel size and the service they render to guests. Most of the food, drinks, preparation of food, consumption by customers and services rendered in the hotels are done by food and beverage units (F&B) of the hotels. Hence, the services rendered in the hotels through the F&B may cause food waste.

Food and beverage unit of a hotel renders its services majorly through the restaurant and bar using the employed staff such as the food and beverage managers, chefs, waiters, store managers who are given job descriptions daily. The daily operations of the restaurant and bar in a hotel are managed by the food and beverage manager who gives instructions to other staff. They predict, plan, and carry out orders, making sure that meal preparations are provided precisely within budget and to meet the hotel's demands until the next order is placed, (Subhajyota,2025). These roles are crucial in that it helps in the proper functioning of the hotel to maximize revenue. These key officers of the food and beverage unit are expected to carry out their work diligently because negligent on their job could cause food waste at preparation stage in the hotel.

Food preparation is the process of assembling raw food items (ingredients) and processing them into a product for consumption. To enhance the flavor or digestibility of food, a variety of methods, equipment, and component combinations are used in hotel settings to make sure food is prepared for customers satisfaction. Hotels utilize unique cooking and food preparation methods that visitors would not find at home to change the shape of food products, they also use instruments for portioning, packaging, assembling, and processing. A variety of methods are used in food preparation include; baking, steaming, stewing, boiling, braising, frying, microwaving, and others (Helfer, 2022). In hotels the food materials and dishes are prepared in the kitchen, the main kitchen, banquet kitchen, soup kitchen, pantry, baking & confectionery, and vegetable departments make up the food preparation and production parts of the food and beverage unit of hotels. This depends on the size and scope of the hotel as well as the activities offered within, these parts could change as the hotel wishes. Hotel F&B sub-sections have the potential to produce food waste on their own due to the food related activity they carry out in the industry.

Food waste in the food and beverage unit of hotels is becoming a major worldwide problem considering the waste generated in the industry. According to Amandeep, Shalini, Puneet, Areej (2020), the food wasted in hotels due to its activities have traditionally generated around 12% of

all food wasted. Food waste it is rapidly gaining relevance in the industry, Wang *et al..,* (2017), stated that the rise in eating out of the house, as well as developments in incomes and tourism, has made hotel food waste a significant issue for both developed and developing countries, including Nigeria. In a study conducted by Bello et al. (2021), 18% of the hotels in Nigeria claimed to have a comprehensive disposal policy, which required anything prepared food in the kitchen that was not consumed by the end of the business day are to be thrown in the garbage which may increase food wastage in such hotels.

It is important to determine the strategies for decreasing food waste in hotel food and beverage department, this could be through in-service training of hotel staff on how to reduce food waste, they can also receive training on how to purchase and assemble food ingredients in addition educate them on the negative impacts of food waste. Regretfully, hotels in Rivers State aim to please their guests above the amount of food they often throw away. This negligent on food wastage have led to the hotel management and staff in the state not to identify the causes and areas that generates food waste daily in food and beverage units of their hotels. Hence, the study assessment of food wastage at preparation stage in food and beverage unit of hotels in Rivers State and to identified the ways of enhancing the reduction of wastage.

## METHODOLOGY

### Design of the study

Descriptive survey research design was adopted for the study. This is a research design in which part or a sample of the population is studied and the selection is made such that it is a representative of the population. According to Nworgu (2015) descriptive survey research design makes use of information gotten from a sample to make generalization on the population. It gives the researchers the background information of how to evaluate the findings and conclusion.

### Area of the Study

The area of study was Rivers State, Nigeria; the study was carried out in Port Harcourt as it is the major city with highest concentration of hotels in the State. Hotel business thrives in Port Harcourt, due to the serious economic activities of the oil and gas (Shell, AGIP, TOTAL FINA, LNG, chevron, Belemaoil, Dominos oil servicing, Maters Energy) companies and other multinational oil firms that host expatriates in the state. The hotels in Port Harcourt do not only provide accommodation for the guests but majorly provide food, drinks and services to individual, on - shore and off- shore staff, expatriates, oil service workers and others.

### Population of the Study

The population of the study was one thousand and fifty (1,053) staff of 351 registered hotels with the Rivers State Ministry of Culture and Tourism. The population consisted of 351 food and beverage managers, 351 chefs, 351 store managers, (Source, Human Resource Department, Rivers State Ministry of Culture and Tourism 2023). These groups of people constitute the population for the study because they purchase, handle, prepare and cook food in food and beverage unit of the hotels and would be able to provide information on food wastage in the food and beverage units of the hotels.

### Sample and Sampling Technique

The method of Alaba and Jinadu (2018) was used to select the sample size. First, was the purposive sampling of the 35 registered hotels in Port Harcourt. Also, the personnel from the hotels such as

chef, store manager, and the food and beverage manager were purposively selected. Secondly, simple random sampling was used to select a sample size of 105 respondents which included 35 food and beverage manager, 35 store managers, 35 chefs from the 35 registered hotels in Port Harcourt, Rivers State.

**Instrument for Data collection**

The primary source of data was used and a structured questionnaire was used to elicit data from the respondents. The instrument for data collection was divided into sections A and B. In section A, checklist was used to obtain data on the types of food wasted at the preparation stage (kitchen). Each item contained different types of food that can be wasted at the preparation in hotels. The items were rated on a 2-point scale of Yes = 2 and No = 1.

In section B, structured questionnaire was also used as instrument for data collection which was focused on the causes of food wastage at preparation stage (kitchen) and the ways to enhance reduction of food waste in food and beverage units of hotels. This section was rated on a 4 - point rating scale coded with nominal values of Strongly Agreed (SA) = 4, Agreed (A) = 3, Disagreed (D) = 2 and Strongly Disagreed (SA) = 1. The instrument was validated by five (5) experts all in University of Nigeria, Nsukka, Enugu State. The experts made necessary corrections on the instrument that guided the researcher in collecting appropriate data for the study. The reliability of the instrument for data collection was established using Cronbach's alpha reliability test.

**Method of Data Collection**

A structure questionnaire was distributed by the researcher assisted by three (3) research assistants. Copies of the filled questionnaire were retrieved immediately because it may not be possible to meet the customers on a later date due shift working periods.

**Method of Data Analysis**

Data generated from the research questions were analyzed using percentage, mean and standard deviation while ANOVA was used to test the null hypotheses at $P>0.05$ level of significance. Data from the checklist was analyzed using percentage. On the other hand, mean and standard deviation were used for the questionnaire containing the 4-point rating scale options.

**Results and Discussion**

**Types of Food Wasted at Preparation Stage in food and beverage unit of hotels**

Table 1 present the percentage (%) score responses of the food and beverage managers, store managers and chefs on the types of food wasted at preparation stages in the food and beverage units. Result showed that the types of food wasted at preparation stage were significantly ($P<0.05$) different. The type food of highly wasted include; cabbage (94.8%), eggs (91.7%) potatoes (91.1%), uziza leaves (78.2%), ukazi leaves (74.8%), yam (67.1%), leafy vegetables (pumpkin leaves) (67.1%), and rice (66.5%). The result of the present is comparable to study reported by Aires, *et. al.* (2021) who reported that vegetables were the most wasted respectively at food preparation stage. The value 94% in this present study is higher than the value of (42%) reported by Bright, *et al…(*2022) who pointed out that the waste created among the various proportions of food products are discarded during preparation. The increase on the types of food wasted could be as a result of ruined food items discard. According to Interreg (2016), the most common foods wasted during food preparation are ruined food items and prepared food that is never served.

**Table 1: Types of Food Wasted at Preparation Stage in food and beverage**

| S/N | Food Type | Frequency Yes | % Yes | Frequency No | % No | Decision |
|---|---|---|---|---|---|---|
| 1. | Rice | 216 | 66.5 | 109 | 33.5 | Yes |
| 2. | Yam | 218 | 67.1 | 107 | 32.9 | Yes |
| 3. | Garri | 84 | 25.8 | 241 | 74.2 | No |
| 4. | Wheat | 70 | 21.8 | 255 | 78.1 | No |
| 5. | Potatoes | 296 | 91.1 | 29 | 8.9 | Yes |
| 6. | Cornflakes | 48 | 14.8 | 277 | 85.2 | No |
| 7. | Oat | 26 | 8.0 | 299 | 92.0 | No |
| 8. | Custard | 14 | 4.3 | 311 | 95.7 | No |
| 9. | Fish | 19 | 5.8 | 306 | 94.2 | No |
| 10. | Chicken | 12 | 3.7 | 313 | 96.3 | No |
| 11. | Turkey | 44 | 13.5 | 281 | 86.5 | No |
| 12. | Gizzard | 27 | 8.3 | 298 | 91.7 | No |
| 13. | Eggs | 7 | 91.7 | 318 | 97.8 | No |
| 14. | Meat | 20 | 6.2 | 305 | 93.8 | No |
| 15. | Beans | 25 | 7.7 | 300 | 92.3 | No |
| 16. | Green beans | 31 | 9.5 | 294 | 90.5 | No |
| 17. | Green peas | 9 | 2.8 | 316 | 97.2 | No |
| 18. | Cabbage | 308 | 94.8 | 17 | 5.2 | Yes |
| 19. | Cucumber | 22 | 6.8 | 303 | 93.2 | No |
| 20. | Broccoli | 38 | 11.7 | 287 | 88.3 | No |
| 21. | Cauliflower | 42 | 12.9 | 273 | 87.1 | No |
| 22. | Carrot | 29 | 8.9 | 296 | 91.1 | No |
| 23. | Sausage/hot dog | 33 | 10.2 | 292 | 89.8 | No |
| 24. | Sardine | 57 | 17.5 | 268 | 82.5 | No |
| 25. | Corn beef | 11 | 3.4 | 314 | 96.6 | No |
| 26. | ketch up (tomato sauce) | 45 | 13.8 | 280 | 86.2 | No |
| 27. | Canned vegetables (green peas) | 32 | 9.8 | 293 | 90.2 | No |
| 28. | Tin tomatoes | 5 | 1.5 | 320 | 98.5 | No |
| 29. | Used vegetable oil | 10 | 3.1 | 315 | 96.1 | No |
| 30. | Spices | 138 | 42.5 | 207 | 57.5 | No |
| 31. | Leafy vegetables (pumpkin leaves) | 218 | 67.1 | 107 | 32.9 | Yes |
| 32. | Uziza leave leaves | 254 | 78.2 | 71 | 21.8 | Yes |
| 33. | Ukazi leave | 243 | 74.8 | 82 | 25.2 | Yes |
| 34. | Melon | 96 | 29.5 | 229 | 70.5 | No |
| 35. | Ogbono | 81 | 24.9 | 244 | 75.1 | No |
| 36. | Cocoyam | 96 | 29.5 | 229 | 70.5 | No |
| 37. | Flour | 84 | 25.8 | 241 | 74.2 | No |

= **Percentage (%) on the types of food wasted**

**Causes of Food Waste at Preparation Stage in Food and Beverage Unit of Hotels**

Table 2 present the mean responds of the food and beverage managers, store managers, chefs on the causes of food waste at preparation stage in food and beverage unit of hotel. Result showed that there is significant ($p<0.5$) difference between the responds on the causes of food wasted at preparation stage. The items agreed upon by the respondents on the causes of food waste include; 3.64 (Large quantity of food stuff purchased), 3.61 (Unskilled peeling and trimming of food stuff by new staff), 3.55 (Growth of fungal /mould on food materials such as dried fish), 3.27 (Expired canned food), 3.17 (Ingredient spoilt before used period), 3.09 (Preparation of excess food), 3.08 (Poor quality of raw food stuff purchased from the market), 3.07 (Unskilled washing of food items by new staff), 3.02 (Large quantity of prepared raw food stuff), 3.00 (long storage of food materials in the store), 2.99 (Insufficient good storage facilities in the hotel) and while 1.94 (poor menu planning), 1.72 (Frequent electricity in the hotel to sustain the refrigerators or freezers), 1.60 (Prepared food stuff was completely used daily) were disagreed upon. The result revealed that item no one 3.64 (Purchasing large quantity of food stuff that are not used up by hotels) had the highest mean value of responses on the causes of food waste at preparation stage. The present study is comparable to the study by Bhajan *et al*. (2022) on fungal growth on food as important contributors to food loss during food preparation. The present study is also in line with the study by Folalu (2023) that stated that improper storage of raw food materials, overproduction of food in the kitchen and over purchasing of food items without sufficient storage facilities were the main causes of food waste in the hospitality industry.

**Table 2: Causes of Food Waste at preparation stage (kitchen) in food and beverage of hotels**

| S/N | Causes of Food Waste at Preparation Stage | $\bar{x}$ | SD | Decision |
|---|---|---|---|---|
| 1. | Large quantity of food stuff purchased | 3.64 | 0.99 | Agreed |
| 2. | Large quantity of prepared raw food stuff | 3.02 | 1.10 | Agreed |
| 3. | Prepared food stuff was completely used daily | 1.60 | 0.86 | Disagreed |
| 4. | Frequent electricity in the hotel to sustain the refrigerators or freezers | 1.72 | 1.02 | Disagreed |
| 5. | Insufficient good storage facilities in the hotel | 2.99 | 0.95 | Agreed |
| 6. | Poor quality of raw food stuff purchased from the market | 3.08 | 1.02 | Agreed |
| 7. | Ingredient spoilt before use period | 3.17 | 1.07 | Agreed |
| 8. | Unskilled peeling and trimming of stuff by new staff | 3.61 | 0.77 | Agreed |
| 9. | Unskilled washing of food items by new staff | 3.07 | 1.12 | Agreed |
| 10. | Expired canned food | 3.27 | 1.09 | Agreed |
| 11. | Preparation of excess food | 3.09 | 0.97 | Agreed |
| 12. | Poor menu plan | 1.94 | 1.04 | Disagreed |
| 13. | long storage of food materials in the store, refrigerator and freezers which causes the taste of food change | 3.00 | 0.99 | Agreed |
| 14. | Growth of fungal (mould) on food materials such as dried fish | 3.55 | 0.75 | Agreed |

**SD = Standard Deviation, $\bar{x}$ = Mean.**

**Ways to Enhance Reduction of Food Waste in Food and Beverage Unit in Hotels.**

Table 3 present the mean responds of the food and beverage managers, store managers and chefs on ways of enhancing reduction of food waste in food and beverage units of hotels. Result showed that ways to enhance reduction of food waste at preparation stage were significantly ($p>0.05$)

different in terms the values agreed upon. The items agreed upon include: 3.92 (Food discarded should be tracked to identify the areas food waste are generated), 3.79 (Sell plate waste to doggy owners), 3.76 (Food discarded should be tracked to identify the areas food waste are generated), 3.73 (Waiters and waitress should be polite to customers), 3.72 (Hotel environment should be kept clean), 3.70 (Create plan for leftover foods), 3.67 (Hotels should sticks to the daily planed menu provided by the establishment), 3.62 (Awareness of impact of food waste should be created among the hotel staff), 3.60 (Waiters and waitress should be neatly dressed at all times), 3.56 (Skilled and qualified staff should be employed), 3.52 (Workshop on food waste should be organize for hotel staff from time to time, 3.51 (Small size dinner plates and dishing spoons should be use for food service as portion control). 3.50 (leftover food should be reused in different ways). 3.42 (Cooking skill or knowledge should be improved), while the following items 1.88(Give leftover food to staff or workers), 1.45 (Donate leftover food to orphanage homes), 1.20 ( Staff should be sub-charged for food waste on their own part) were disagreed upon. Result revealed that item number one 3.92 (Food discarded should be tracked to identify the areas food waste are generated) had the highest value of responses on the ways of enhancing reduction of food waste in the food and beverage unit of hotels. The highest item agreed upon in the present study is in agreement with the study reported by Earth Care (2022), who pointed out that by tracking and evaluating food waste from the point of origin to the point of disposal and developing a strategy for leftovers, the hospitality sector may decrease food waste in hotels. Additionally, employing food waste management strategies, will prevent food waste, (Folalu, 2023).

**Table 3: Ways to Enhance Reduction of Food Waste in Food and Beverage Unit in Hotels**

| S/N | Ways to Enhance Reduction of Food Waste in Hotels | $\bar{x}$ | SD | Decision |
|---|---|---|---|---|
| 1. | Create plan for leftover foods | 3.70 | 0.76 | Agreed |
| 2. | Food discarded should be tracked to identify the areas food waste are generated | 3.92 | 0.62 | Agreed |
| 3. | Small size dinner plates and dishing spoons should be use for food service as portion control | 3.51 | 0.66 | Agreed |
| 4. | Awareness of impact of food waste should be created among the hotel staff | 3.62 | 0.72 | Agreed |
| 1. | Cooking skills or knowledge should be improved | 3.42 | 0.78 | Agreed |
| 2. | Leftover food should be Reuse in a different way | 3.50 | 0.89 | Agreed |
| 3. | Hotels should sticks to the daily planed menu provided by the establishment | 3.67 | 0.77 | Agreed |
| 4. | Skilled and qualified staff should be employed | 3.56 | 0.66 | Agreed |
| 5. | Donate leftover food to Orphanage homes | 1.45 | 0.71 | Disagreed |
| 6. | Sell plate waste to doggy owners | 3.79 | 0.58 | Agreed |
| 7. | Give leftover to staff or workers | 1.88 | 0.96 | Disagreed |
| 8. | Hotel environment should be kept clean | 3.76 | 0.61 | Agreed |
| 9. | Waiters and waitress should be neatly dressed at all times | 3.60 | 0.64 | Agreed |
| 10. | Waiters and waitress should be polite to customers | 3.73 | 0.82 | Agreed |
| 11. | Staff should be sub-charged for food wasted on their own part | 1.20 | 0.19 | Disagreed |
| 12. | Workshop on food waste should be organize for hotel staff from time to time | 3.52 | 0.76 | Agreed |

**Key: Number = 325, $\bar{x}$ = Mean, SD = Standard Deviation**

## Conclusion

Based on the findings of the study, result revealed that cabbage (94.8%) was the highest value rated food type wasted at preparation stage (kitchen) in hotels. There was a significant ($p>0.05$) difference in the mean responses of the food and beverage managers, store managers and chefs on the causes of food wasted at preparation stage in food and beverage units of different hotels. There was a significant ($p>0.05$) difference on the ways to enhance reduction of food waste. The study recommended that food discarded should be tracked to identify the areas food waste are generated which will also help in reducing waste at preparation stage in food and beverage unit of hotels.

**Reference**

Amandeep, D., Shalini, T., Puneet, K., Areej, M. (2020). "Food waste in hospitality and food services: A systematic literature review and framework development approach", *Journal of Cleaner Production*, 8(2), 11-16

Bello, A, Bello, N. I, Baba,. K. A. & Abubakar, A.S (2021) Challenges of Food Storage and Preservation in Restaurants in Katsina Metropolis, Katsina State, Nigeria. *Eurasian Journal of Food Science and Technology*, 2, 36-146

Bhajan, C., Neetoo, H., Hardowar, S., Boodia, N., Driver, M.F., Chooneea, M., Ramasawmy, B., Goburdhun, D. & Ruggoo, A. (2022), "Food waste generated by the Mauritian hotel industry", *Tourism Critiques*, 3(2), 120-137. doi.org/10.1108/TRC-04-2022-0010

Earth Care Equipments PVT. Limited, (2022) Food Waste Management In Hotels & Restaurants. Retrieved 23/6/23 from: https://www.ecepl.com/food-waste-management/

Edizioni., C (2012). Food waste: causes, impacts and proposals. Info graphics (pp. II, 14, 27, 50 and 65) centimetri.it. www.barillacfn.com info@barillacfn.com

Food and Agricultural Organization (FAO). (2017). Food Loss and Food Waste. Retrieved 5/7/23 from: www.fao.org/food-loss-and-food-waste/en/

Food and Agricultural Organization (FAO). (2016). Save Food: Global Initiative on Food Loss and Waste Reduction. FAO partners with the IFWC to fight against food waste in the food services sector. Retrieved 6/7/23 from: http://www.fao.org/save-food/news-and-multimedia/news/news-details/en/c/387881/

Folalu A. A (2023). The Effect of Food Waste on the Profitability of Hotel Industry in Selected Hotels in Ogun State.

Interreg, C. E. (2016). Food waste Prevention in Tourism and food Preparation. Retrieved 30/11/23 from http://www.reducefoodwaste.eu/pa-8-food-waste-prevention-in-tourism-and-food-preparation.html

Mercedes, D, (2019). How to manage hotel food and beverage services: redefining F&B in the hospitality industry. Retrieved 30/4/23 from https://joinposter.com/en/post/hotel-food-and-beverage

Nworgu, B.G. (2015). Educational research: Basic issues and methodology (3rd Ed). Enugu: University Trust Pub.

Nguyen, K. L. (2018). Food waste management in the hospitality industry. Case study: Clarion Hotel Helsinki**.** Retrieved 24/7/23 from: www.haag-heliauniversity-of-appliedsciences

Subhajyota,. K (2025). What Does a Food and Beverage Manager Do? Roles, Responsibilities, and Career Insights. Retrieved from https://inspiria.edu.in/food-beverage-manager-roles-duties-career-salary/

Tongco, M. D. C. (2007).Purposive Sampling as a Tool for Informant Selection. *Ethnobotany Research and Applications*, *5*, 147–158. Retrieved from https://ethnobotanyjournal.org/index.php/era/article/view/126

Wang, L. Liu, G. Liu, X. Liu, Y. Gao, J. & Zhou, B. *(2017).* The weight of unfinished plate: a survey based characterization of restaurant food waste in Chinese cities. *Waste Management,* 66, 3-12, 10.1016/j.wasman.2017.04.007

Wells, H.F & Hyman, J. (2014). Reducing and managing food waste in hotel: green hotel program USA:1-5. *hospitality research*, 11(1), 1-8.