

REPURPOSING FOOD WASTE IN THE HOSPITALITY
INDUSTRY TO REDUCE HUNGER AND
ENVIRONMENTAL IMPACT

By

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ENVIRONMENTAL IMPACT

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This study focuses on repurposing food waste in the hospitality industry in order to reduce hunger and environmental impact by exploring the relationship between food waste and sustainability and hunger. A review of current literature regarding the issue of food waste and sustainability, and hunger has been presented. Data was collected through means of observation of a student-managed on-campus restaurant at a large public Midwestern University. Following the observations, further data was collected through interviews conducted with student staff members of the on-campus restaurant with regard to the recorded observations. The results of the observations indicated the areas in which the greatest and least amount of food waste is produced on a given business day. The results of the interviews corresponded with the recorded observations, as well as provided insight into staff members feelings about the food waste produced and the desire and willingness to repurpose the food waste produced. A plan of action was provided in this study as a guideline for future studies whom look to implement a plan to repurpose food waste, while reducing hunger and environmental impact in the hospitality industry. The analysis of the observation and interviews can be used as a reference in future studies to help hospitality leaders discover what processes produce the most food waste and discover the willingness of the staff to help implement a plan to repurpose the food waste produced.

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CHAPTER I

INTRODUCTION

Globally around ‘1.3 billion tons’ of edible material is wasted (Gustavsson, Cederberg, Sonesson, Van Otterdijk, & Meybeck, 2011) every year, in the U.S. alone ‘72 billion pounds’ (Feeding America, 2019) of edible food is wasted every year and yet in the U.S. more than 40 million individuals annually are faced with hunger (Coleman-Jensen, Rabbitt, Gregory, & Singh, 2018) part of those 40 million Americans are college students. A restaurant donating food at the end of the night that had not been sold during the day to a homeless shelter, is an example of food waste and sustainability, and the issue of hunger simultaneously being improved.

Restaurants consciously donating unsold food indicates a positive step towards reducing food waste, becoming more sustainable and making an effort in reducing hunger. In a growing socially and environmentally ethical society, there is evidence of the hospitality industry making a conscious effort to reduce environmental impact in regards to food waste, implementing more sustainable strategies and providing help to those who face the issue of hunger.

This chapter is inclusive of the purpose of the study, a background of the literature reviewed for this study, the objective that the study is striving to achieve, and a glossary containing appropriately defined terms that pertain to the study. This chapter precedes the literature review of Chapter Two, which focuses on previous research conducted on food waste

and sustainability, and hunger. The association between food waste and sustainability, and hunger has limited research, however the two work simultaneously in order to create a solution to reducing environmental impact caused by food waste. The limited research on the relationship between these two subjects is what has led to this paper's core research questions. The purpose of this paper is to formulate a solution that encompasses the problems surrounding food waste and simultaneously providing a solution to hunger. The analysis of this paper will be formed through observations and interviews pertaining to the process and uses of repurposed 'usable' food waste (extra food that has been prepared) and 'non-usable' food waste (kitchen scraps and leftovers from plates) in order to effectively reduce the amount of food waste produced and to help those in need.

Purpose of Study

The purpose of this study is to evaluate the relationship between food waste, sustainability, and hunger, in order provide a solution to both issues by highlighting the benefits of donation and composting within the hospitality industry. The researcher acknowledges that there are multiple processes that may be involved in evaluating the relationship between food waste, sustainability and hunger within the hospitality industry.

Background for the Study

The sole impact that the food system has on the environment is enormous. From start to finish food:

“accounts for 20% of global greenhouse gas emissions, and 92% of the global water footprint is related to agriculture. In addition are issues such as land degradation, overfishing and local air and water pollution. The fact that roughly one-third of all food is lost or wasted has received less attention. It therefore appears that food waste is a

substantial, but largely neglected contributor to environmental change” (Kallbekken & Saelen, 2013).

With this in mind there is still a large portion of the global population that faces hunger.

Currently the world produces enough food to feed 10 billion people (Holt-Gimenez, Shattuck, Altieri, Herren, & Gliessman, 2012), yet “1.3 billion tons of edible material is wasted worldwide every year” (Vandermeersch, Alvarenga, Ragaert, & Dewulf, 2014). Globally around 800 million people struggle with hunger (Senauer & Sur, 2001), in the US alone more than 40 million people struggle with hunger (Coleman-Jensen et al., 2018). With an ever-increasing global population, there is a larger need for environmental consciousness and to be more mindful of those that are in need. These are two global issues that have the potential to provide solutions for each other that reduces their impact.

Need for the Study

The environmental impact that food waste has on the environment is a well-known concept within the hospitality industry, however with federal regulations that are implemented for the hospitality industry, often times food is thrown away before it can be used or repurposed. The social issue of hunger and solutions that can be implemented to reduce the issue of hunger has been researched and discussed in various previous studies; however, this study explores a solution that addresses both issues that work together to make improvements in order to reduce food waste and hunger. Currently, there are very few studies that incorporate a solution to simultaneously resolve food waste in the hospitality industry and hunger. With the current federal guidelines that are implemented on the hospitality industry, is it possible to redistribute ‘usable’ food waste to more impoverished areas? Is it possible to repurpose ‘non-usable’ food waste for composting? The impact that food waste has had on the environment and the issue of

hunger have been persistent issues for decades, that have been searching for resolutions to end these persistent problems. With the global population constantly increasing, food waste and hunger have the potential to become a larger problem, and the environmental impact that food waste has would be much more severe. There is a current lack of tourism literature that discusses solutions to reduce both hunger and food waste. The hope is that the solutions to the research questions that are described in this study will provide insight for the hospitality industry to become more environmentally and socially ethical by repurposing food waste to those in need or for non-consumption purposes.

Objective of Study

Currently there is a lack of tourism literature that discusses the correlation between food waste and hunger. Previous studies on food waste and sustainability, and hunger will have some influence that is applied throughout this study on a defined location of an on-campus restaurant, at a large University in the Midwestern portion of the United States. The purpose of this study is to evaluate the relationship between food waste and sustainability, and hunger and provide a solution to both issues by highlighting the benefits of donation and composting. To accomplish this, the study worked with and collected data with a Hospitality and Tourism Management student run restaurant. The data collected had two main components. The first was set of data was collected through means of observation of how much food waste was produced throughout a given business day of both usable and non-usable food waste. The second set of data collection was through in-person interviews conducted with the student staff members of the kitchen in regard to the observations recorded and to open a dialogue about food waste and how it can be repurposed.

Definitions of Study Terms

Composting: Organic matter that has been decomposed to be turned into a soil fertilizer.

Donation: The act of donating something (food).

Environmental Impact: Any change to the environment that could be adverse or beneficial, wholly or partially due to an organization's activities, products or services.

Food Waste: Wholesome edible material intended for human consumption, arising at any point in the food supply chain that is instead discarded, lost, degraded or consumed by pests. (Vandermeersch et al., 2014)

Usable Food Waste: Any unused prepared food that can be repurposed into another form of sustenance.

Non-Usable Food Waste: Any food bi-products or partially consumed food that cannot be served to the public that can only be repurposed in the form of compost.

Green Space: Areas of grass, trees, or other vegetation that has a recreational or aesthetic purpose.

Hospitality Industry: A broad category of fields within the service industry that is inclusive of food and drink services, theme parks, cruise lines, event planning, lodging, traveling, and additional fields that include tourism.

Hunger: Feel or suffer through lack of food.

Sustainability: Avoidance of the depletion of natural resources in order to maintain an ecological balance.

CHAPTER II

LITERATURE REVIEW

Food Waste

For a few decades food waste has been a major topic within the hospitality industry. As the hospitality industry continues to grow, so does the problem with food waste. Food waste has an impact on revenue but has received the greatest amount of attention for the large environmental impact that results from food waste. Food waste is an issue everywhere, on average 1.3 billion tons of edible food is thrown away every year around the globe (Gutavsson et al., 2011). Throwing away edible food instead of using it for its intended purposes has substantial environmental impacts and is unsustainable both economically and ecologically (Silvennoinen, Heikkilä, Katajajuuri, & Reinikainen, 2015). With the 1.3 billion tons of edible food being thrown away a separate study showed that food waste contributes 20% of global greenhouse gas emissions (Hertwich & Peters, 2009). To put into perspective the sheer environmental impact that food waste has on the environment BIO Intelligence Services estimate that roughly one kilo of food produces nearly two kilos of (CO₂) which leads to the depletion of about 2.9 tons of natural resources (Monier, Mudgal, Escalon, O'Connor, Gibon, Anderson, & Morton, 2010). Considering a vast majority of food waste ends up in landfills, when it begins to decompose it produces methane which is roughly 25 times more harmful than the CO₂ that is produced (EPA, 2016). It is estimated that 50% of all waste created in the hospitality is made up for by food

waste (Curry, 2012). Roughly 40% of annual global food waste comes from restaurants in the hospitality industry (Verill, 2016). One primary example of food waste production and the impact that results from it could be found within the United States. Seventy-two billion pounds of food waste is created each year in the U.S and this is not inclusive of household food waste (Feeding America, 2019). These 72 billion pounds of food waste contribute to 21% of landfills in the U.S. (Feeding America, 2019). These landfills are responsible for one third of all methane production within the U.S (Food Waste Reduction Alliance, 2019). In another article, the USDA found that the methane released from the landfills accounted for 14.1% of greenhouse gas emissions in the U.S. in 2017 (USDA, 2019). Food waste contributions come from all aspects of the food cycle, in the United States alone 16% of food waste comes from farming, 40% from consumer facing businesses (i.e. restaurants), 2% from manufacturers and 43% from homes (Feeding America, 2019). It is estimated that between 25- 40% of food that is grown, processed and transported in the U.S. will never be consumed (Food Waste Reduction Alliance, 2019). Consumer facing businesses such as restaurants contribute to a large portion of food waste. In one survey of restaurants, the average amount of food of all respondents was around 33 pounds of food per \$1000 dollars of revenue earned. Overall the total amount of food waste produced by the respondents was 2.1 billion pounds of food waste (Food Waste Reduction Alliance, 2014). Of the 2.1 billion pounds of food waste that was created, only 1.4% was donated, 14.3% was recycled, and the remaining 84.3% was disposed of (Food Waste Reduction Alliance, 2014). One study showed that the style of service affected how much food waste was produced. Restaurants that used the a la carte style of service generated less waste than a buffet style of service (Pirani & Arafat, 2015). In this study there will be an observation conducted at an on campus public

mid-western university restaurant with regard to how much food waste is produced on any given business day.

Sustainability

As with any issue, there are individuals looking for a solution, one key solution to the problem of food waste is sustainability which takes place in many forms. One form of food sustainability is repurposing food waste into other useful products such as compost. One study outlined a hierarchy of solutions to food waste, first and foremost prevention, secondly reusing food waste for human consumption and thirdly recycling and repurposing food waste into feed for livestock (Mourad, 2016). Another study discussed a more in-depth hierarchy of food waste management starting from the most favorable options to least: prevention, prepare for re-use (donations), recycle, recovery, disposal (Papargyropoulou, Lozano, Steinberger, Wright, & Ujang, 2014). Although these are all viable options to reduce food waste recycling, recovery, and disposal neared the bottom of the hierarchy because they are the least preferred methods in comparison to actually feeding those who are hungry (Papargyropoulou et al., 2014). One study of a buffet showed that a reduction in plate sizes by only a few centimeters reduced the overall amount of food waste by 20.5% (Kallbekken & Saelen, 2013). In this same study guests were told to come back as much as they wanted, and with a plate size reduction of 1 cm, food waste was reduced by 2.5 kg (7.4%) and with a plate reduction size of 3 cm food waste was reduced by 22% (Kallbekken & Saelen, 2013). Reducing plate size in a buffet style of restaurant would be effective in reducing food waste due to the fact that guests are often overstimulated with the amount of options and variety of food presented. There is an effect called the Delbeouf illusion, which is suggestive of individuals overserving on larger plates and underserving on smaller

plates because individuals will perceive the same portion as too little on a larger plate but too much on a smaller plate (Wansink, 2013). Plate size reduction and portion control are viable options for reducing the amount of food waste produced. Various studies have discussed repurposing food waste for animal feed, however one study discussed creating an optimal composting recipe from food waste and other bulking agents (Adhikari, 2007). Another useful bi-product of food waste is turning food waste into animal feed. One study conducted in Florida took all fresh food waste (plate scraps and leftover food) dehydrated the food waste and added in other nutritious food items such as soy hulls or ground corn and used this mixture to create feed for pigs (Myer, Brendemuhl, & Johnson, 1999). Anaerobic composting and anaerobic digestion are also possible forms of repurposing food waste. Composting has various benefits and uses primarily to enrich soils and help plant life. Compost enriches soil which helps to “retain moisture and suppress plant diseases and pests” (EPA, 2018). Compost contains both macro and micro nutrients that tend to be absent in fertilizers, and switching from fertilizers to compost enriched soils would reduce runoff that pollutes the waterways and thus reducing the environmental impact (Whatcom County Extension, Washington State University, 2019). Compost can be comprised of ingredients such as egg shells, nut shells, coffee grounds, fruits and vegetables, tea bags, etc. (EPA, 2018) items that would be considered non-usable food waste. In the United States many of these techniques are being used to reduce food waste and the impact it has on the environment. One study of over a thousand restaurants in the U.S. diverted food wastes destination and was able to repurpose 19.4% of food waste into compost (Food Waste Reduction Alliance, 2014). Repurposing these non-usable food waste items into compost would prevent these items from ending up in a landfill, reducing the production of greenhouse gas emissions and contributing to a form of sustainability. Another form of

sustainability in regards to food waste is food recovery (donations). Donations of usable food waste has gained more attention in order prevent usable food from ending up in the landfill as well as to help those in need. Feeding America has teamed up with Starbucks and other major food distributors to help increase food recovery. Last year alone Feeding America and their partners were able to rescue 3.5 billion pounds of food from going to the landfill which in turn went to help feeding those in need (Feeding America, 2019). One study revealed that in an attempt to divert food waste from ending up in a landfill only 8.8% was donated to those in need (Food Waste Reduction Alliance, 2014). Although donations would be a preferred method to throwing away usable food waste, one study found that there are various barriers for restaurants to be able to donate food. This study discovered that of all the restaurants surveyed aside from transportation and insufficient refrigeration, liability concerns for small businesses were 67% and for were 56% for large businesses (Food Waste Reduction Alliance, 2014). Fifty six percent of large and small companies faced regulatory restraints which proved to be a barrier to food donation (Food Waste Reduction Alliance, 2014), which for many restaurants is the main reason for not donating food to those in need. Although staying within legal regulations for food donation is the main goal of any and all restaurants who donate, restaurants in the U.S. are protected under the Federal Bill Emerson Good Samaritan Food Donation Act. This act protects companies and organizations from civil and criminal liability in the event that the recipient of the goods donated in good faith later on cause harm (i.e. food poisoning) (Feeding America, 2019). In this study there will be an open dialogue with willing participants to discuss two types of sustainability that are highlighted in this study: donation and composting.

Hunger

For centuries hunger has been a prevalent global issue and continues to be a global issue. In fact, this is such a large-scale global issue that in 2001 it was estimated around 800 million people struggle with hunger annually (Senauer & Sur, 2001), and as of now that number has grown to over 820 million (FAO, 2019). Hunger affects many aspects of an individual's life, for example children who face hunger have a higher risk of becoming overweight, and the potential for chronic diseases and obesity later on in their life (FAO, 2019). However, in many first world countries hunger is still a major issue for many individuals. Take the U.S. for example, more than 40 million people a year go to the food bank & organization Feeding America for help to feed themselves or their family. Feeding America discusses those who are impacted by hunger the most, some of the major categories include children, seniors, rural communities, and various demographics. Amongst those individuals, college aged students are some of the 40 million Americans who face hunger annually. One study conducted in 2017, collected data on two hundred and thirty-seven undergraduate students of a large mid – Atlantic public university (Payne-Sturges, Tjaden, Caldeira, Vincent, & Arria, 2017). This study focused on the prevalence of food insecurity (hunger) in college students and the effects that food insecurity has on the students. From the sample of two hundred and thirty-seven undergraduate students, 15% of the students were food insecure and another 16% were at a high risk of becoming food insecure. The main reason for food insecurity in these university students is that there wasn't enough money over the course of a year to eat properly, eat an adequate amount, or even really eat at all (Payne-Sturges et al., 2017). A separate study conducted at the University of Hawai'i Manoa, surveyed various members of the student body during randomly selected classes, subjects and class times. The results of this survey showed that 21% of students at the University of Hawai'i Manoa are

food insecure, and when broken down further 15% of those students had low food security and 6% has very low food security (Chaparro, Zaghoul, Holck, & Dobbs 2009). Overall in this same study 45% of the university students surveyed were food insecure or at risk of being food insecure and the recommendations to establish on-campus food banks along with student gardens (Chaparro et al., 2009). Aside from the sheer number of students on college campuses who are faced with hunger (food insecurity) there is various adverse effects to these individuals who are faced with hunger. As a side effect of hunger, a student's academic success, health, wellness, and behavior can have a negative impact in all of these areas (Cady, 2014). Take children for example, children in the U.S. who are faced with hunger are at a higher risk of developing anemia and asthma, repeat grades in elementary school, develop motor impairments and are more likely to have social and behavioral issues (Feeding America, 2019). In more recent years there has been a shift in focus on college aged students and the impact that hunger has on students and the amount of college aged students who are faced with hunger. In a recent study published by Feeding America, of 150 food banks that participated in their survey of college students and hunger, 129 of the participating food banks (86%) are currently serving food insecure college students (Berry, Sloper, & Doll, 2019, p.6). It is a much more prevalent issue than many others realize. In this study there will be a plan of action provided that is designed to address the issue of student hunger, as well as a dialogue about addressing student hunger.

CHAPTER III

METHODS

The purpose of this study is to examine the amount of food waste produced at a college campus restaurant, and how to reduce the food waste. This research will investigate the production of food waste through means of observation of kitchen processes, and discuss repurposing food waste through interviews conducted with Hospitality and Tourism Management students. The findings of this study will expand on the literature discussing food waste, sustainability and hunger and how these three factors can work together to reduce food waste and its environmental impact while simultaneously reducing hunger on a college campus. This chapter introduces the research design, observations, interviews, data collection, data collection procedures and plan of action in order to accomplish the purpose of this study.

Research Design

This study used a qualitative research design by conducting observations of food waste collected during the day, during operating hours of an on-campus restaurant. This was followed by in-person interviews that pertain to the observations collected by the PI.

Observations

Due to time limitations, the observation portion of this study for the on-campus restaurant took place on the last business day of the week (Friday) from 9 o'clock AM to 3 o'clock PM. During this time the collection of food waste was observed from various kitchen operations such as preparing meals, the food waste created from hours of operations (food scraps from guest plates), and finally the food waste that is generated from closing operations in order for the restaurant to stay within legal regulations. Photographic evidence of the trash bins was acquired during this time frame to allow for a visual representation to place emphasis on the food waste collected during the work day during hours of operation.

Interviews

Several members of the kitchen staff were asked to participate in this study. As part of the in-person interview, the photographs collected during the observation portion were shown to the team members who work in the restaurant, and discussions about the amount of food waste produced and how the team members felt about the amount of food waste took place. In order to participate the individuals must answer recruitment questions. Responses to the interview questions were discussed and recorded.

Data Collection

The method of data collection chosen for this study was qualitative and inclusive of observations of the kitchen and in-person interviews. The observation portion took place over the course of one business day. The PI recorded observations throughout the day in ten to twenty-minute intervals, from 9 AM to 3 PM. The size of the garbage bins in the kitchen would

be recorded in order to obtain some quantitative data. Following the observation day, in-person interviews were conducted with members of the kitchen staff of the restaurant.

Data Collection Procedure

In order to conduct observations of the kitchen, the PI must provide a consent form, informing the kitchen staff of the PI's presence and what the PI will be doing during the observation day. The consent form does not require a signature in order to keep the identities of the kitchen staff anonymous. The observations for data collection were conducted in the Hospitality and Tourism Management student lab kitchen of the restaurant located in the building of the College of Human Sciences. As observations were being made and recorded, discussions with the staff members in the kitchen about food waste being produced occurred. Following the observation day, the PI conducted in-person interviews with the restaurant kitchen staff. In order to conduct the in-person interviews the PI must provide a consent form for the individuals, acknowledging that their participation is voluntary and that the interview will be conducted in a private location. The consent form does require a signature, however the names of the individuals interviewed will be kept anonymous.

CHAPTER IV

RESULTS

In this section the results are presented in the order of observations of kitchen processes followed by interviews conducted with members of the kitchen staff. In the observation section of this segment, observations were recorded in ten to twenty-minute increments. Photographs were simultaneously taken during these increments to show the progression of food waste throughout the day. The following section within this segment is the interviews conducted with members of the kitchen that had been observed. These individuals were asked recruitment questions in order to continue with the interview process. The identity of the individual is kept confidential. As the individual continued with the interview process, photographs taken during the observation were shown to the participating individuals. The individuals were asked how the photographs made them feel, as well as questioned about what happens with the leftover food, and if donations have been a consideration for this restaurant.

Observations

The PI spent one business day in the on-campus restaurant kitchen observing where food waste is mainly produced whether it be from production, guest plates or extra prepared food.

Some quantitative data was obtained during the observation portion of this study, in order to have a relative idea of how much food waste is produced throughout the day.

Table 1: Recorded Observations

Time	Observation
9:10 AM (Pre-operating hours)	<ul style="list-style-type: none"> • Salad station has some lettuce and tomato scraps in the trash bin • Various other trash bins have packaging in them • Currently food waste is at a minimum • Prepared food is covered in bowls and ready for service
9:20 AM	<ul style="list-style-type: none"> • Pesto pasta prepared in a large bowl, some pesto is very thinly spread around the bowl due to mixing, no larger pieces left in the bowl • On the flat top grill there are some very, very small pieces of meat that have fallen off during cooking, otherwise no waste produced • In salad container and pasta bowl some very small pieces of pasta and salad left in the container • Remaining pesto, lemon juice/lemon slices were covered and stored to be reused
9:40 AM	<ul style="list-style-type: none"> • Minor pasta scraps in the trash • Salad station added minor amount of scraps, mainly basil stocks • Some spills/food scraps have fallen on the floor – to be thrown away later • Coffee grounds from freshly brewed coffee were in the trash can • There are six rectangular garbage bins (each holds 30 gallons)

	<ul style="list-style-type: none"> • There are two round garbage bins (each holds 44 gallons)
10:00 AM	<ul style="list-style-type: none"> • More small scraps from the flat top grill have accumulated • Food prepared in the hot box: 4 round hotel pans, 4 full sized hotel pans, 3 – 1/3 hotel pans, 1 soup well • Some pesto was thrown away
10:30 AM	<ul style="list-style-type: none"> • Food starting to be sent out to the buffet
10:36 AM	<ul style="list-style-type: none"> • Cilantro was thrown away (it was too old to use)
11:00 AM (Operating hours)	<ul style="list-style-type: none"> • Cauliflower being prepared for dish, bases thrown away • Parsley stocks beings thrown away during preparation • Ice cream machine temporarily broke, the cream/custard was scooped into a bowl and salvaged • Some pieces of kale fell out of the wok • Food waste (scraps) and plastic/gloves in the same trash bin • Frozen chocolate from the ice cream machine was thrown away • More Kale caught in trap • More coffee grounds in the trash bin • Cauliflower prep continues – many bases in the rectangular trash bin • Smaller garbage bin staring to get full
11:35 AM	<ul style="list-style-type: none"> • Guest plates have come in, some waste produced from guest plates was then added to the garbage bin • Baked cauliflower scraps left on baking sheet then thrown away • Prep station rectangular garbage bin half full with cauliflower bases

	<ul style="list-style-type: none"> • Some pasta fell in the prep sink
11:51 AM	<ul style="list-style-type: none"> • More guests showed up, resulting in slight increase of scraps from guest plate • Kale is made fresh by the bag, more fell out of the wok
11:59 AM	<ul style="list-style-type: none"> • A pasta pan was pulled from the buffet, the remaining scraps were put into the garbage • As preparation continues more food falls on the floor
12:15 PM	<ul style="list-style-type: none"> • The restaurant is busier since more guests have arrive, more food waste from guest plates is produced
12:24 PM	<ul style="list-style-type: none"> • Clean up in the kitchen begins, extra prepared food is pulled from the hot box, then properly stored to be reused (only food that will last the weekend)
12:51 PM	<ul style="list-style-type: none"> • One hotel pan of prepared squash thrown away • Extra sauce that had been opened was switched to another container and then wrapped and stored properly • Scraps from the grill had been pushed to the trap
1:00 PM (Restaurant is closed)	<ul style="list-style-type: none"> • No longer accepting guests
1:07 PM	<ul style="list-style-type: none"> • Remaining food on the buffet is used for family meal to feed the kitchen staff and servers

<p>1:52 PM</p>	<ul style="list-style-type: none"> • Leftover food that will still be safe to use on Monday will be used to for Monday family meal • Due to similar cuisine the following week some leftover food that would be safe to use will be used for the cuisine next week • Leftover bread was thrown away • Food that had been reheated once must be thrown away
<p>2:00 PM</p>	<ul style="list-style-type: none"> • All clean up in the kitchen is complete, time to take out the trash • One full round trash bin (44 gallons), and one full rectangular bin (30 gallons), and four partially filled rectangular bins (roughly one full bin) were all thrown into the dumpster at closing

Figure 1 & 2: Food Waste at the Beginning of the Day



Figure 3: Old Food Thrown Away



Figure 4: Cauliflower Preparation Begins



Figure 5: Basil Stocks Thrown Away



Figure 6: Cauliflower Preparation cont'd



Figure 7: Food Waste from Guest Plates Begins



Figure 8: Cauliflower Preparation cont'd



Figure 9: Food Waste in the Middle of Service



Figure 10: Food Waste at the End of Service



Figure 11: Prepared Squash Thrown Away During Clean Up



Figure 12: Kale from Food Trap



Figure 13: Food Waste After Family Meal



Interviews

The researcher conducted in-person interviews with the team members of the restaurant kitchen. The interviews took place in a private space, and one by one, in order to keep the interview private. The questions regarding the observations collected by the PI are as followed:

- 1) How long have you worked in the Hospitality Industry?
- 2) Have you worked in restaurants before?
- 3) Do you currently or have previously worked in the restaurant kitchen?
- 4) Are you familiar with how the restaurant kitchen operates?
- 5) How long have you been a part of the kitchen?
- 6) On average, how much food waste does the restaurant produce per day? How much per week?
- 7) What happens to leftover food throughout the week?
- 8) What happens to leftover food at the end of the week?

- 9) Looking at the photographs of food waste taken from the observation portion of this study, how do they make you feel?
- 10) After seeing these photos of food waste collected throughout the day, in what ways would you want to reduce the amount of food waste produced?
- 11) How much of the food waste is repurposed for compost?
- 12) How big is the composting operation at the restaurant?
- 13) What happens to the compost once it is done? Is the compost donated to people or organizations outside of the university?
- 14) Does the restaurant donate leftover food to those in need?
- 15) Have you heard of the Federal Bill Emerson Good Samaritan Food Donation Act?
- 16) Would you consider donating leftover food to serve a dual purpose to reduce food waste produced from leftover food and to help feed those in need?
- 17) Would you consider donating the food to students on-campus to help address the issue of student hunger?

The discussions that were conducted with each team member were insightful for the purposes of this study. To start off the interview, the PI discovered that each team member has had between three and a half years and five years of hospitality industry experience, have worked in restaurants before, currently or previously work in the restaurant, and is familiar with how the restaurant kitchen operates. Continuing the interview, interviewees were asked “How long have you been a part of the restaurant kitchen?” Each interviewee has also been a part of the restaurant kitchen between one to two years each. One interviewee said “This is my third semester as a TA (teaching assistant) but did a semester as a student, so I’ve been in the restaurant for four semesters” (Courtney, 22, TA). As the interview continued the primary

researcher inquired about “how much food waste does the restaurant produce per day? How much per week?” When answering this question, each interviewee had roughly the same response stating that per day, they throw out roughly one large round trash bin which holds 44 gallons, and about three smaller rectangular trash bins which hold about 30 gallons. This comes out to roughly 134 gallons per day, and since the restaurant is open four days a week from Tuesday through Friday, this comes out to roughly 536 gallons of food waste produced each week. However, one team member stated:

“It depends on the day. So, on Fridays, we have a lot more waste, because everything has to go, and we have to toss everything. Also, because we’re a buffet some days it is way more than others because we don’t have as many customers and we have a lot of leftovers, we have to toss them if they’ve gone out” (John, 20, TA) to the buffet line.

Following the inquiry about how much food waste is produced per day and throughout the week, the interviewees were then asked “What happens to leftover food throughout the week?” One team member shared that “What can be saved, we save for the next service day” (John, 20, TA). The same team member went on to answer the next question “What happens to leftover food at the end of the week?” the interviewee responded “What can be saved and can make it through the weekend is saved for family meal on Monday, but what cannot be saved is thrown away” (John, 20, TA). As a response to both inquiries about what happens to the leftovers throughout the week and at the end of the week each member responded unanimously, stating that throughout the week the restaurant kitchen tries to salvage any leftovers that are still considered safe for consumption. When leftovers/ extra prepared food is safely stored it can be reused for service the next day which is what the restaurant tries to do in order to salvage the

food. However, on Friday's that is not always the case. The restaurant kitchen staff tries to save any food that would still be safe to consume after the weekend and that food is used for family meal to feed the staff members after a long day of preparation. Subsequently, the food that is not safe for consumption or to be reused is in fact thrown away at the end of the day. After discussing what happens to leftover food during the week, the primary researcher revealed the photographs taken during the observation day to each interviewee. This led the primary researcher to say "Looking at the photographs of food waste taken from the observation portion of this study, how do they make you feel?" Each participant unanimously had said they wasteful, wondered what could be done to reduce the food waste, one individual stated:

"They make me feel really wasteful, and make me think about other people who are out there who could benefit from them, from animals to soup kitchens. It makes me think that they could benefit from half of that stuff (food waste produced). We could compost it" this same individual went on to say "I think we should definitely keep the trash and food (waste) separate, that way we could do something with the food waste" (Courtney, 22, TA).

Continuing with the interview, the primary researcher then asked "After seeing these photos of food waste collected throughout the day, in what ways would you want to reduce the amount of food waste produced?" Each member wishes there was more that could be done to reduce the amount of food waste that is produced, especially if there are other more beneficial ways to reduce the amount of food waste. A team member stated that: "sometimes they ask people from the other restaurant to come over to eat so it does not go to waste. But they don't do it often, so I would tell the other restaurant people to come and get some lunch" (Jim, 20, TA). Another team

member said “We should utilize compost, and to do better about using the stuff that we have” (John, 20, TA).

As the interview continued, the following questions pertained to composting. The primary researcher asked each team member “How much of the food waste is repurposed for compost?” Each team member admitted that there was no composting operation set up at the restaurant, however one team member said “There used to be composting, but we have not done it a while. But when I first started as a TA we would compost, and then we just stopped” (Jim, 20, TA).

This same team member went on to answer the following question “How big is the composting operation at the restaurant?” and they stated that it is “not big as of right now” (Jim, 20, TA).

Although there is no composting operation set up at the restaurant the one team member was able to answer the question “What happens to the compost once it is done? Is the compost donated to people or organizations outside of OSU?” This team member revealed that it was donated to someone outside of OSU and that individual “used to come pick it up” (Courtney, 22, TA).

Following the discussion about composting the primary researcher went on to ask “Does The restaurant donate leftover food to those in need?” Each member unanimously stated that currently the restaurant does not donate any extra usable food waste (food that is still safe for consumption), however one member stated that “at some point in time, we used to donate our extra products to homeless shelters, but we’ve stopped doing that because there is a lot of regulations imposed on that” (John, 20, TA). Additionally, a couple of the members also mentioned that previously there was a student in the lab who “used to take all of the food that was leftover on Friday, wrap it up and take it to a local women’s shelter” (Jim, 20, TA).

However, once this student completed the course, they did not continue with donating the leftover food. Upon discussing food donation, the primary researcher then asked each

interviewee “Have you heard of the Federal Bill Emerson Good Samaritan Food Donation Act?”

When the interviewees were asked this question, each of them stated that they had not heard about the Bill Emerson Good Samaritan Act. The PI explained that the Bill Emerson Good Samaritan Food Donation Act protects restaurants or organizations who donate food in good faith from criminal and civil liability in the event that a recipient becomes sick from the donated food. One member admitted that they “had not heard about this act until this study” (Jim, 20, TA). After further discussion about the Bill Emerson Good Samaritan Food Donation Act, the PI went on to discuss the members willingness to donate “Would you consider donating leftover food to serve a dual purpose to reduce food waste produced from leftover food and to help feed those in need?” Each member happily stated that they would donate food to serve as a dual purpose to reduce food waste and help those in need. One team member stated that “it would be a really cool idea” (Courtney, 22, TA) to donate food to those in need. At the end of the interview the primary researcher inquired one final question which was “Would you consider donating the food to students on-campus to help address the issue of student hunger?”

Unanimously, all interviewees said ‘yes’ to donating food to students on-campus to serve as a dual purpose to address the issue of hunger and to reduce food waste.

CHAPTER V

CONCLUSION AND IMPLICATONS

This chapter offers a conclusion of this study's major findings which is inclusive of a summary of the study, implications of the findings, limitations, and suggestions for future studies.

Summary of the Study

The main purpose of this study was to evaluate the relationship between food waste and sustainability, and hunger and provide a solution to both issues by highlighting the benefits of donation and composting within the hospitality industry. This relationship was investigated through means of observation of kitchen processes and interviews pertaining to the recorded observations. The findings of this study are an expansion on the literature on food waste and sustainability, and hunger, and how these three factors can work together to produce solutions for each other. The hospitality industry is constantly growing, and easily one of the largest industries, which consequently contributes to a large portion of food waste that is produced. Much of the food waste produced is thrown away instead of repurposed, meaning most food waste ends up in a landfill contributing to greenhouse gas emissions. However, food waste can be rescued from the landfill and repurposed for compost or if it is usable food waste it can be repurposed to feed those in need. The observations conducted in this study provided insight into

the different areas in which food waste was produced, additionally interviews provided further insight into kitchen members willingness and desire to be more environmentally and socially responsible. The analysis of the observations and interviews conducted in this study coincide with the proposed plan of action, which can aid businesses within the hospitality industry to sustainably reduce the amount of food waste produced, reducing the environmental impact and reducing the number of those who are faced with hunger.

Implications

Observations

The outcome of the observations conducted in this study discovered that majority of the food waste produced on the given business day came from kitchen processes (preparation), followed by scraps from guest plates, leftover food, and throwing out non-usable food waste, such as the prepared cilantro that was too old to use. Knowing where food waste comes from and at what point it is most heavily produced, is helpful for business owners and managers to know in order to implement a plan that can target the area that produces the greatest amount of food waste. What can be taken from the results of the observations is that managers and kitchen members could implement a plan to reduce the amount of food waste from preparation, as well as implement a plan to repurpose the food waste, especially into compost if it is not donated. This would allow for the restaurant to become more environmentally and socially responsible. As the hospitality industry continues to grow, it is important for businesses to know where their food waste is coming from and to have a plan put in place to repurpose the food waste produced to become more environmentally and socially responsible.

Interviews

The interviews conducted in this study had an insightful and positive outcome. Although there currently is no composting operation set up at the restaurant, the interviews conducted with the team members indicated that there had previously been a composting operation. Quite a few members wished that the restaurant had continued with the composting operation or would start one up again. The interviews also revealed that the restaurant used to donate extra produce to local shelters but stopped doing so, yet all of the interviewees unanimously said that they would like to donate food to those in need, and would absolutely donate to students who are faced with hunger. However, the interviews also revealed that none of the interviewees had heard of the Federal Bill Emerson Good Samaritan Food Donation Act, which would protect a business from civil or criminal liability in the event that the recipient of the food donated in good faith were to become ill. Knowing the legal protections provided to businesses, as well as knowing the willingness of the staff members to do more is important for managers and business owners to know. This is important for managers or business owners to know because this allows the business to legally do more, but also indicates that they have the support of their staff to implement a plan to reduce and repurpose food waste, such as composting, donation or both. Encouraging and empowering businesses in the hospitality industry to implement plans to repurpose both usable and non-usable food waste is of the utmost when trying to reduce hunger and the environmental impact derived from food waste.

Limitations

There were several contributing factors that led to limitations imposed on this study. The geographical location in which the observation and interviews took place, limited the variety of participants in this study. The restaurant that was observed, doubles as a student learning lab, as

a result the PI was only permitted to observe the kitchen processes for one day during business hours from 9 o'clock AM to 3 o'clock PM. This limited the amount of observations that could be recorded, as well as hindering the ability to provide a more in depth and holistic view of kitchen processes throughout the week. The interviews conducted were with the students who work in the student ran restaurant. The interviews were conducted with the group of participants because these individuals contain the greatest amount of knowledge of the kitchen and its processes throughout the week. However, the limitation that developed from this pool of participants resulted in very uniformed responses to the interview questions despite interviews being conducted privately with each individual. This study had no financial resources as it did not collaborate with outside sources and was conducted independently. Furthermore, the skills possessed by the primary researcher limits the analysis and interpretation of the observations and interviews conducted in this study.

Plan of Action

Based on the results of the observations and interviews conducted in this study the PI has a created a plan of action that could help this on-campus restaurant reduce the amount of food waste produced through means of repurposing the food waste. With hunger being a prominent issue across the globe and across the U.S., especially at a university level, more can be done with on-campus restaurants to help students who are faced with hunger. In addition to providing a meal to those who are impacted by hunger, in order to reduce environmental impact, the truly non-usable food waste would be collected in separate bins to then be composted. The on-campus restaurant that collaborated with this study, is a full-service buffet style restaurant. As many other buffets practice there is extra food prepared in case the projected number of guests is higher than predicted, or one dish is preferred to others. As a result, there is leftover food which

can be reused for the next day as long as it is safely and properly stored. However, on Friday which is the last business day of this on-campus restaurant any extra food must be thrown away if it is not consumed, or considered safe to be stored and reused. There are various options and adaptations that can be made to this plan. For example, food donations can be considered a tax-deductible donation as long as it is to a qualified charity. A qualified charity is inclusive of nonprofit hospitals, religious organizations and nonprofit charitable organizations.

However, in this proposed plan of the reusable food waste would not be donated to a charity, but students on campus who are faced with hunger. In order to implement this plan, a list of students must be created, and allowed to be contacted. To do this the PI would be in contact with Financial Aid Office in order for them to compile a list of students based off of financial need. The PI would provide a form with the location and name of the restaurant, the date, an area to place campus ID, and the hours available for the students to come to the restaurant. The hours and dates provided would only be on Friday afternoons, after closing hours. This would be the available dates and times listed because the restaurant is only open during the week days from Tuesday-Friday, as a result any leftover or extra food on Friday that would not last the weekend would otherwise be thrown away, unless it is donated to students while it is still usable. This food that would otherwise be thrown away would already be considered a 'loss' for the business. A 'loss' is when the restaurant can no longer make a profit from the product, i.e. when the restaurant closes, the remaining or extra food that was prepared would be considered a loss to the business. When the students are contacted with this form, their identity would be kept anonymous to the PI and any other participant in the restaurant. In order to sign up and protect the identity of the individual, the individual would be asked to only provide their campus ID number. Upon arrival to the restaurant the individual would be asked privately to verbally dictate

their campus ID to the host, the host would cross off their ID from the list to indicate they have arrived and not ask for any further information. The student would then be allowed to enter the restaurant and have access to any of the remaining/ extra food the restaurant has provided. This provides college students who are faced with hunger an additional meal during the week in which they will not have to worry about how to pay for said meal. In order to ensure that the restaurant still complies to legal regulations and keeping the students safe, those who will be serving or participating in the restaurant after hours will currently work in the restaurant, or have completed the student lab and ServSafe qualifications. Since this is a student lab, in order to incentivize the students who currently are working in the lab to participate, this service opportunity can be used to make up a missed lab or as extra credit. The extra credit/service opportunity would also be opened up to other students who fit the serving criteria (i.e. completed this lab and have the ServSafe qualification) in other courses. Additionally, to reduce the amount of environmental impact from food waste, aside from less food being thrown away due to consumption of food, any non-usable food waste such as guest or kitchen scraps, can then be collected in a separate bin that will be used for compost. The food waste collected will then be donated to either the Agricultural or Horticultural major students to utilize and turn into compost for learning purposes, or the campus landscaping services to turn into compost to use in green spaces around campus instead of fertilizer. With the food waste repurposed as compost Agricultural or Horticultural students would have hands on learning experience with how to produce compost. Simultaneously campus landscaping could save money on fertilizer, as well as reduce the environmental impact of fertilizer on campus grounds. Furthermore, there could be a combination of these two alternatives; Agricultural or Horticultural students could gain hands on experience with composting and then the compost can be provided to campus landscape to

distribute to campus green spaces. As a result of this plan of action, this on campus restaurant would be able to reduce its environmental impact created from food waste by providing students faced with hunger a proper meal and repurposing non-usable food waste for compost to then be distributed on campus.

Suggestions for Other Studies

As the world becomes more socially and environmentally responsible it is important for businesses to follow the same notion. The hospitality industry is built around serving and helping others and following the notion of being socially and environmentally responsible would be beneficial, not only to the business but to society as well. This study provides insight, and understanding about the relationship between food waste, sustainability, and hunger, and how the relationship between these three factors can provide a solution to the reduction of food waste, hunger and environmental impact that is produced from food waste. Due to the limitations encountered in this study there are vast opportunities for more detailed and further exploration of the relationship between food waste, sustainability, and hunger. A future study may possess more time to record observations of kitchen processes and where the production of food waste occurs the most. This would allow for more accurate representation of kitchen processes during the work week and throughout the year. Additionally, future studies may have access to more than one restaurant and various other campuses to collect further data. Due to time constraints this study was not able to provide the students of a public mid-western university who are faced with hunger a meal as described in the plan of action. However, future studies that have more time and access to more resources could implement the plan of action provided in this study or use it as a guideline to help implement a similar plan of action. Being able to provide a meal to

students who are faced with hunger, and compost any non-usable food waste, has the potential to substantially reduce the amount of food waste produced. As a result, this would reduce the number of individuals who are faced with hunger, while simultaneously reducing the environmental impact created by food waste, and both processes would be sustainable ways to reduce food waste. As the hospitality industry continues to grow, the more businesses continue to look for ways to become socially and environmentally responsible. Therefore, there is a need to continue research regarding the relationship between food waste, sustainability, and hunger, and to provide solutions that are inclusive of these three factors, such as the plan of action provided in this study.

APPENDIX A: IRB APPROVAL



Oklahoma State University Institutional Review Board

Date: 01/29/2020
Application Number: IRB-20-1
Proposal Title: Repurposing Food Waste in the Hospitality Industry to Reduce Hunger and Environmental Impact

Principal Investigator: Rebecca Blundon
Co-Investigator(s):
Faculty Adviser: Catherine Curtis
Project Coordinator:
Research Assistant(s):

Processed as: Exempt
Exempt Category:

Status Recommended by Reviewer(s): Approved

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in 45CFR46.

This study meets criteria in the Revised Common Rule, as well as, one or more of the circumstances for which continuing review is not required. As Principal Investigator of this research, you will be required to submit a status report to the IRB triennially.

The final versions of any recruitment, consent and assent documents bearing the IRB approval stamp are available for download from IRBManager. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be approved by the IRB. Protocol modifications requiring approval may include changes to the title, PI, adviser, other research personnel, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any unanticipated and/or adverse events to the IRB Office promptly.
4. Notify the IRB office when your research project is complete or when you are no longer affiliated with Oklahoma State University.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact the IRB Office at 405-744-3377 or irb@okstate.edu.

Sincerely,
Oklahoma State University IRB

APPENDIX B: WAIVER OF CONSENT FORM



School of Hospitality and Tourism Management

CONSENT FORM

Repurposing Food Waste in the Hospitality Industry to Reduce Hunger and Environmental Impact

Background Information

You are invited to be in a research study of repurposing food waste in order to reduce hunger and environmental impact. We ask that you read this form and ask any questions you may have before agreeing to be in the study. Your participation in this research is voluntary. There is no penalty for refusal to participate, and you are free to withdraw your consent and participation in this project at any time.

This study is being conducted by: Rebecca Blundon, School of Hospitality and Tourism Management, under the direction of Dr. Catherine Curtis, School of Hospitality and Tourism Management

Procedures

If you agree to be in this study, we would ask you to do the following things: Go about your business day as if the PI is not there, while the PI observes kitchen processes. Fulfill all of your regular job duties that are required of you during the work day. The PI will photograph the food waste products that are created during normal business day activities.

Participation in the study involves the following time commitment: The time commitment is one business day (roughly eight hours), during pre-existing scheduled hours of operation.

Compensation

Participation in this study is completely voluntary. You will receive no payment for participating in this study.

Confidentiality

Because of the nature of the data, I cannot guarantee your data will be confidential and it may be possible that others will know what you have reported. The researchers will make every effort to ensure that information about you remains confidential, but cannot guarantee total confidentiality. Your identity will not be revealed in any publications, presentations, or reports resulting from this research study.

We will collect your information through means of observation. The PI will observe kitchen methods of the disposal of food waste products, as well as take photographs of the garbage to keep track of how much food waste is produced. These observations and photographs will be stored in a folder in a locked room, as well as on a password protected computer in a locked file, all of which is limited to the PI.

Contacts and Questions

The Institutional Review Board (IRB) for the protection of human research participants at Oklahoma State University has reviewed and approved this study. If you have questions about the research study itself, please contact the Principal Investigator at 316-652-5316, rblundo@okstate.edu. If you have questions about your rights as a research volunteer or would simply like to speak with someone other than the research team about concerns regarding this study, please contact the IRB at (405) 744-3377 or irb@okstate.edu. All reports or correspondence will be kept confidential.

Statement of Consent

I have read the above information. I have had the opportunity to ask questions and have my questions answered. I consent to participate in the study.

If you agree to participate in this research, please check the box below next to "I agree to continue with this study" to indicate your consent to participate in this study.

I agree to continue with this study

APPENDIX C: CONSENT FORM



School of Hospitality and Tourism Management

PARTICIPANT INFORMATION FORM

Repurposing Food Waste in the Hospitality Industry to Reduce Hunger and Environmental Impact

You are invited to be in a research study of repurposing food waste in order to reduce hunger and environmental impact conducted by Rebecca Blundon, undergraduate Senior of the School of Hospitality and Tourism Management, under the direction of Dr. Catherine Curtis, faculty of the School of Hospitality and Tourism Management, adviser of PI. Your participation in this research is voluntary. There is no penalty for refusal to participate, and you are free to withdraw your consent and participation in this project at any time.

If you agree to be in this study, we would ask you to do the following things: Participation in the study will involve an in-person interview, in which focuses on the amount of food waste produced and repurposing the food waste in the form of compost or donation. You will only be offered to participate in this study once, and you can expect to take 30-45 minutes for the interview process to be complete.

Compensation: Participation in this study is completely voluntary. You will receive no payment for participating in this study.

Confidentiality: The information you give in the study will be anonymous. This means that your name will not be collected or linked to the data in any way. The researchers will not be able to remove your data from the dataset once your participation is complete. This data will be stored on a password protected computer in a restricted access folder.

Contacts and Questions: If you have questions about the research study itself, please contact the Principal Investigator at 316-652-5316, rblundo@okstate.edu. If you have questions about your rights as a research volunteer, please contact the OSU IRB at (405) 744-3377 or irb@okstate.edu.

If you agree to participate in this research, please sign our name and date at the bottom.

Signature: _____ Date: _____

APPENDIX D: INTERVIEW QUESTIONS

Interview Questions

- How long have you worked in the Hospitality Industry?
- Have you worked in restaurants before?
- Do you currently or have previously worked in the restaurant kitchen?
- Are you familiar with how the restaurant kitchen operates?
- How long have you been a part of the kitchen?
- On average, how much food waste does the restaurant produce per day? How much per week?
- What happens to leftover food throughout the week?
- What happens to leftover food at the end of the week?
- Looking at the photographs of food waste taken from the observation portion of this study, how do they make you feel?
- After seeing these photos of food waste collected throughout the day, in what ways would you want to reduce the amount of food waste produced?
- How much of the food waste is repurposed for compost?
- How big is the composting operation at the restaurant?
- What happens to the compost once it's done? Is the compost donated to people or organizations outside of the university?
- Does the restaurant donate leftover food to those in need?
- Have you heard of the Federal Bill Emerson Good Samaritan Food Donation Act?
- Would you consider donating leftover food to serve a dual purpose to reduce food waste produced from leftover food and to help feed those in need?
- Would you consider donating the food to students on-campus to help address the issue of student hunger?

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