Northern Light Health: Blue Hill Study

We partnered with Northern Light Blue Hill to conduct a two-month long study that looked at where food was being wasted, and how much this was costing the facility. We worked closely alongside Barb Haskell and her team to conduct this study. The food waste study began on November 7, 2022 and was completed on January 10, 2023.

Executive Summary and Recommendations

- Outdated and Spoiled food waste was the largest source of food waste in both weight and cost (41% of all food waste weight, 45.2% of food waste costs)
- Blue Hill has an annual food waste cost per bed of $155-$255 (Based on plate waste from patients)
- Make smaller batches of prepared foods (wraps, sandwiches) initially, evaluate sales rate and make secondary batches based on daily projections
- Discuss options with Sysco about unexpected substitutions
- If these substitutions are inevitable, kitchen staff may have to come up with strategies to utilize unexpected items
- Introduce reduced portion sizes for patients to reduce plate waste
- Sell wraps, sandwiches, and salads at reduced prices to staff members and/or members of the community to reduce food waste

Introduction

Food waste is a prevalent issue, both globally and locally. ReFED reports that the foodservice sector, which includes hospitals and hospitality services, wasted 12.7 million tons of food in 2019. ReFED also cites that the best way to reduce food waste is to track it – which is why we conducted this study with Blue Hill. While it may seem like tracking food waste would be burdensome for an already understaffed kitchen, when we spoke with members of the staff after the study, they noted that the process was easy and did not take a long time. From past Mitchell Center projects, we have learned that when people have to weigh the food they are wasting, they see the issue that exists and they are more motivated to curb this waste. Some studies have shown that in hospitals, an average of almost 40% of all food served to patients gets returned back to the kitchen as food waste. Other studies have determined that the median plate waste is 30% by weight, with a range of 6-65% (Williams & Walton, 2011). Depending on current food cost and industry costs, food waste comes out to be a large issue where the budget is concerned.

Blue Hill is a small facility with only 25 inpatient beds. The facility is undergoing construction of a new cafeteria, but the hospital is downsizing to 10 beds in the next year. The new cafeteria will have greater access for members of the surrounding community, which could be good for the hospital in terms of reducing food waste. Further, Northern

Light Health as an organization recently switched from a smaller and local distributor to Sysco, a well-known and much larger distributor. For some of Northern Light's larger hospitals, the change might have cost-saving benefits. However, for a smaller location like Blue Hill, Sysco did not seem to be working out. Some of the challenges that Blue Hill faces with this new distributor is that Sysco makes substitutions for the facility when they are not able to supply what was originally ordered. Some of these substitutions can be adjusted by the facility, but some of these substitutions cannot be altered. Further, some of the set quantities required for order are too large for Blue Hill, but they are not available in other sizes.

Due to the economies of scale of food production, we could hypothesize that larger Northern Light Health hospitals have a smaller amount of food waste per patient. However, Blue Hill composts the majority of its food waste, and it uses a room service model, meaning that patients receive a menu and get to order what they would like rather than simply being fed something chosen by the kitchen. These factors contradict each other, which is why further studies are needed with larger Northern Light Health facilities. We cannot accurately project the food waste costs of the system simply based on the Blue Hill numbers because of these factors.

Methods

The study with Blue Hill began by an on-site meeting between Barb Haskell and her team, as well as the team of researchers. Researchers were shown around the facility and discussed problem areas going into the study. After the meeting, food waste sheets were initially created, and then subsequently changed a few weeks into the study to better fit the needs of Blue Hill (see Appendix A). Members of the kitchen staff were required to measure all wasted food daily using these sheets. These sheets were then sent off to a Mitchell Center intern who input the data into a specialized food waste tracker (see Appendix B). At the end of the two months, the intern compiled the data, analyzed it, and created a food waste report that was shared with the staff members of Blue Hill hospital.

Waste was defined in several categories, and the tracking sheets reflected this. Waste was divided into different types of food waste, as well as different reasons for wasting. The types of waste were as follows:

- Overproduction – Mainly kitchen waste; prep waste included
- Outdated / Spoiled – Received directly from vendor, or prepared in kitchen
- Plate Waste – Mainly patient waste

Waste was further divided into "Received," "Prepared," and "Consumer." Waste was also divided into different categories for food: Grain/Starch, Fruit and Vegetables, Protein, Prep Waste, Baked Goods, Salad, Wraps / Sandwiches, Soups, and Other. These categories were all defined on the waste sheets.

Data

The findings from Northern Light Health Blue Hill were mostly as expected, with patient waste overall being lower than both the staff and researchers assumed going into the study. The largest costs in this study were from outdated and spoiled food waste, both in weight and cost (Figures 1 and 2). The majority of this food waste was received directly from the vendor and was seen in the Dairy and Fruit and Vegetables categories of food (Figure 3). Another large piece of outdated and spoiled food waste was salads, which are prepared in the kitchen with items received from the vendor. Researchers took the data from the study and projected it to provide annual cost predictions for Northern Light Health Blue Hill hospital. From the data provided, researchers predict that Blue Hill has an annual cost per bed (patient) of $155 - $255 (Figure 4). Researchers then projected total food waste cost per cafeteria meal, and projected both costs for the hospital annually (Figure 5).

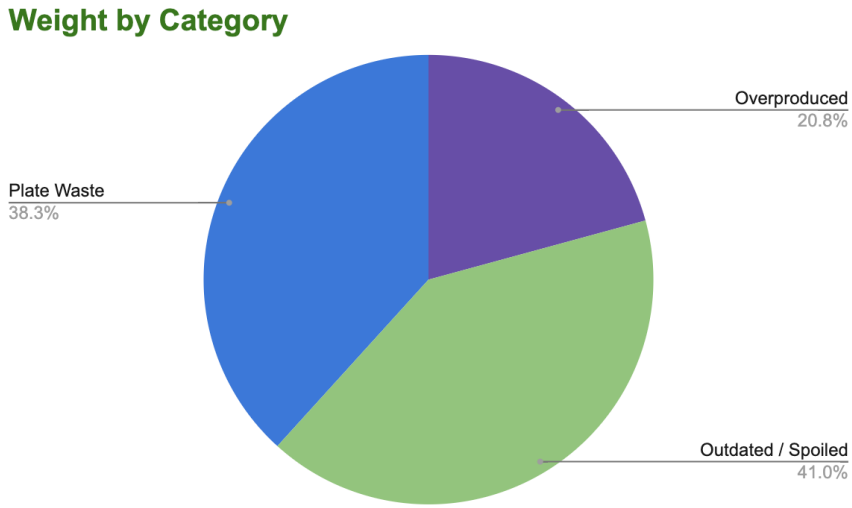

Figure 1: Total food waste weight by category. This figure shows the distribution of food waste categories by their weights.

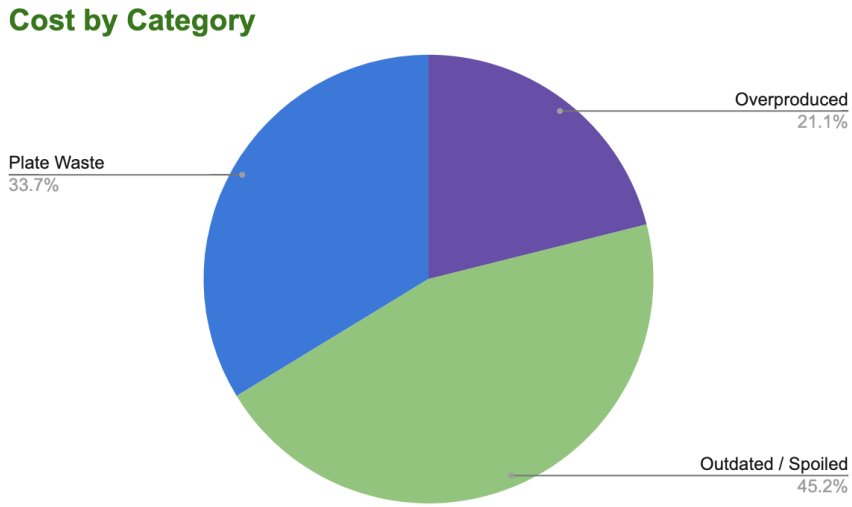

Figure 2: Total food waste cost by category. This figure shows the distribution of food waste categories by their total cost. Costs may vary depending on the season, and it is important to note that this study took place during a time period where natural disasters hurt farmers across the United States. Because Sysco ships food over several states at a time, prices went up due to the natural disasters.

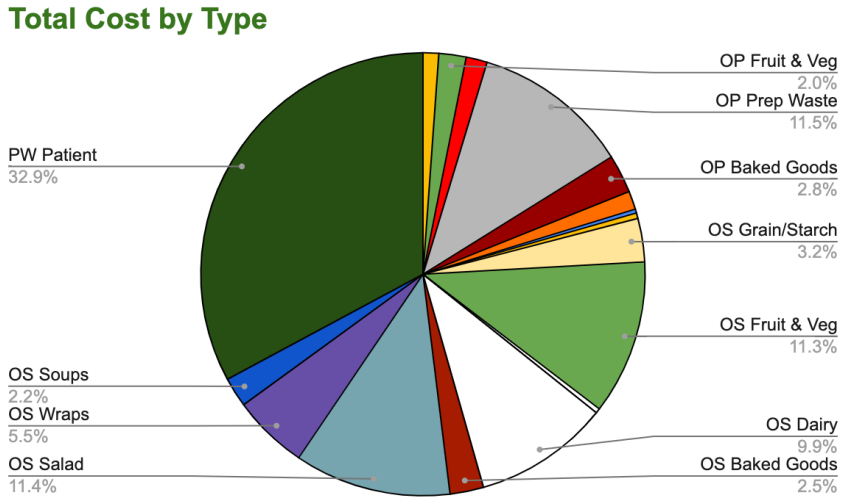

Figure 3: Total cost by type of food waste. This figure shows the breakdown of specific types of food waste that contribute to the whole system. OS stands for outdated / spoiled food waste, OP stands for overproduced food waste, and PW stands for plate waste.

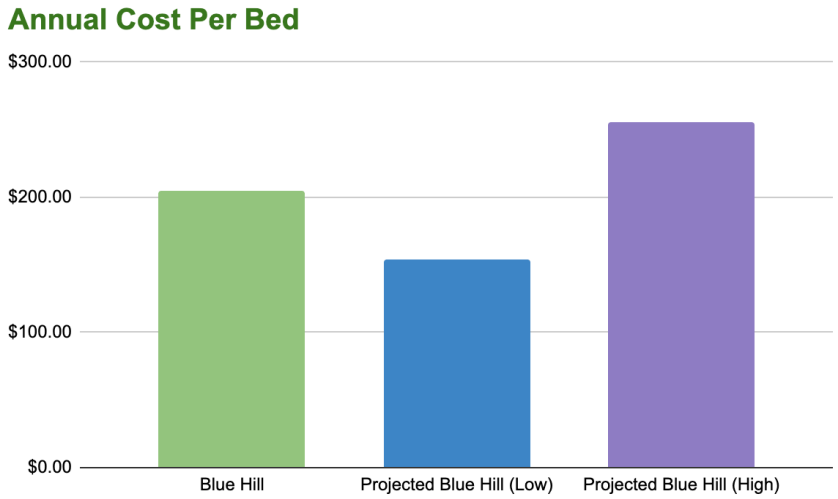

Figure 4: Annual food waste cost per bed. The measure of "per bed" applies to patient numbers. In this study, the amount of patients served at each mealtime was averaged to find this number. Because Blue Hill is small, it is likely that it faces lower per patient food waste costs compared to larger Northern Light Health hospitals with larger quantities of food and subsequently food waste.

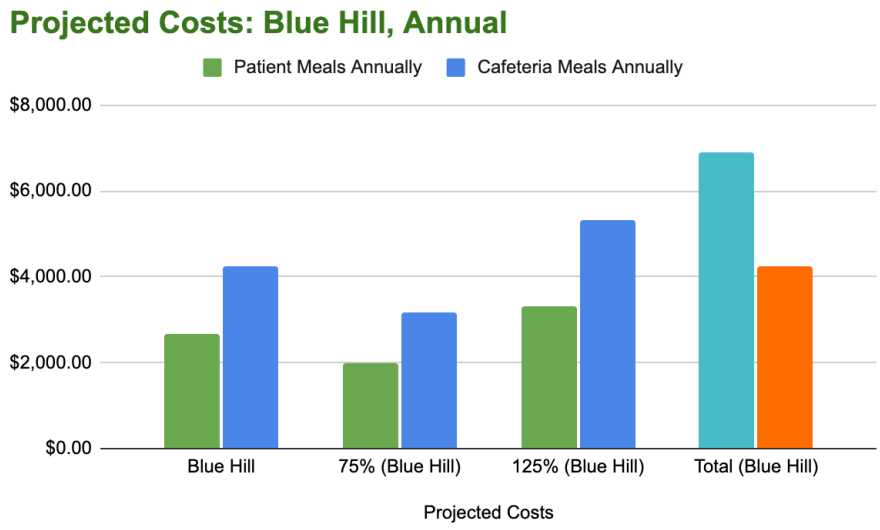

Figure 5: Projected food waste costs for Blue Hill, annually. This figure shows the projected food waste costs of Blue Hill by comparing patient meals and cafeteria meals annually. The teal-colored bar represents the total cost to Blue Hill yearly from the combination of cafeteria food waste and patient food waste. The orange bar represents the total cost to Blue Hill if patient waste were mitigated.

Discussion

As shown in Figures 4 and 5 above, reducing patient food waste would be helpful to Blue Hill to lower their overall food waste costs. Researchers project that by reducing patient plate waste, Blue Hill can reduce its overall food waste costs by 38%. One tool that

could help Blue Hill achieve this goal is to introduce reduced portion sizes to patients. Blue Hill already has a room service model, which is known to produce less patient waste. However, by introducing reduced portion sizes that patients can choose from, Blue Hill could lower patient waste even further. Researchers made this recommendation to Blue Hill staff. Another recommendation from the researchers is to sell wraps, sandwiches, and salads at reduced prices when they are nearing their end date. Because Blue Hill is getting a new cafeteria that will have greater access for the surrounding community, this idea could save Blue Hill food waste costs, and make them money in the process. By implementing both of these recommendations, Blue Hill could reduce food waste costs by over 50% annually.

As seen in Figure 3, outdated and spoiled Fruit and Vegetables and Dairy are large areas of food waste for Blue Hill in terms of cost. Both of these categories come directly from the vendor. When speaking with Barb Haskell, she noted that dairy is one area where Blue Hill has to order a certain quantity, but that this quantity is often too large for the small facility. Fruit and vegetables, including salad, accounted for the highest cost in the study. Some of this food waste cost has to do with rising prices of produce during the time of the study. However, it is important to note that patient waste, while significant in both weight and cost, was lower than expected by the staff of Blue Hill. This could be for a number of reasons, but the likely answers are that Blue Hill has a low amount of patients in general, and that costs for produce varied greatly throughout the study. If this study were conducted again with Blue Hill, it would be interesting to analyze a different time of year to see if that has any effect on patient waste versus other types of food waste.

Outdated and spoiled food waste was a large issue in terms of weight and cost (Figures 1, 2, and 3). We recommend that Blue Hill first works alongside Sysco to understand why the product often comes in nearly expired or damaged, as well as what substitutions Sysco makes and what power Blue Hill has to alter or cancel these substitutions. We also recommend that Blue Hill has a flexible menu to accommodate for these substitutions. Working directly with Sysco is the best course of action for both Blue Hill and all other Northern Light Health properties. In the long run, further studies are needed between the Mitchell Center and the Northern Light Health system to get accurate numbers on food waste. These studies will also help determine the efficacy of Sysco as a partner of Northern Light Health at various locations with various sizes.

Conclusion

Our research pointed out important themes in food waste. First, outdated and spoiled food, often in the form of produce received directly from vendors, points to a larger trend of transportation and quality issues with produce in the United States currently. Second, plate waste continues to be a large issue for businesses. While Blue Hill already

has a menu style patient meal system, it seems that more can be done to reduce patient waste. Researchers in this study recommend that Blue Hill first works with Sysco to reduce food waste in various ways. Other recommendations include introducing a reduced portion size for patients and selling wraps, sandwiches, and salads that are nearing their end date at reduced prices. Researchers also suggest further studies with the Mitchell Center at different Northern Light Health locations for a fuller picture of food waste within this hospitality system.

Appendix A – Food Waste Sheets

The following are the food waste sheets used every week by members of the kitchen staff. The original model is the first figure shown, and the second figure shown is the updated model after a few weeks of the study. The sheets were updated at the request of the staff and Barb Haskell, once she had settled on information she wanted to note from the data.

Resident Population:		Kitchen Waste (KW)			Date/meal:
1 Plate weight:	Specific Food	Amount (lbs)	Reason for Loss	Destination (Compost, Trash, ect)	Cost/lb
Protein					
Grain					
Fruits and Vegetables					
Dairy					
Other					
Dairy					
Salads					
Wraps					
Baked Goods					
Soups					
Post Consumer Waste					

Resident Population:		Kitchen Waste (KW)			Date/meal:
1 Plate weight:	Specific Food	Amount (lbs)	Reason for Loss	Destination (Compost, Trash, ect)	Cost/lb
Protein					
Grain					
Fruits and Vegetables					
Dairy					
Other					
Dairy					
Salads					
Wraps					
Soups					

Resident Population:		Kitchen Waste (KW)			Date/meal:
1 Plate weight:	Specific Food	Amount (lbs)	Reason for Loss	Destination (Compost, Trash, ect)	Cost/lb
Protein					
Grain					
Fruits and Vegetables					
Dairy					
Other					

Reason For Loss: Overproduction			
Type of Food:	Specific Food:	Amount (please circle):	Prepared in Kitchen or Received from Vendor (please circle):
Grain / Starch		oz / lbs	Prepared / Received
Fruit / Vegetable		oz / lbs	Prepared / Received
Protein		oz / lbs	Prepared / Received
Dairy		oz / lbs	Prepared / Received
Baked Goods		oz / lbs	Prepared / Received
Salad		oz / lbs	Prepared / Received
Wraps / Sandwiches		oz / lbs	Prepared / Received
Soups		oz / lbs	Prepared / Received
Other		oz / lbs	Prepared / Received

Reason For Loss: Outdated and/or Spoiled			
Type of Food:	Specific Food:	Amount (please circle):	Prepared in Kitchen or Received from Vendor (please circle):
Grain / Starch		oz / lbs	Prepared / Received
Fruit / Vegetable		oz / lbs	Prepared / Received
Protein		oz / lbs	Prepared / Received
Dairy		oz / lbs	Prepared / Received
Baked Goods		oz / lbs	Prepared / Received
Salad		oz / lbs	Prepared / Received
Wraps / Sandwiches		oz / lbs	Prepared / Received
Soups		oz / lbs	Prepared / Received
Other		oz / lbs	Prepared / Received

Plate Waste	
Amount (lbs):	
Number of Patient Meals Served Today:	
Number of Cafeteria Meals Served Today:	

Date: _____

Appendix B – Specialized Food Waste Tracker

This food waste tracker was initially created by a previous Mitchell Center intern. The idea behind this tracker is that it would be applicable to all businesses because it is malleable and can be constantly updated. This snapshot shows the personalized options chosen by Northern Light Health Blue Hill.

			Overproduced	Grain/Starch	Fruit & Veg	Protein	Prep Waste	Baked Goods	Salad	Wraps	Soups	Other	Outdated / Spoil	Grain/Starch	Fruit & Veg	Protein	Dairy
December 5 202			Week 5 Meals Served:														
2	<-Day of Week	Received	886	0	0	0	0	0	0	0	0			0	0	0	
		Prepared		0	0	0	3.5	0	0	0	0			0	0	0	
		Consumer		0	0	0	0	0	0	0	0			0	0	0	
December 6 202																	
3	<-Day of Week	Received		1	0	0	0	0	0	0	0			0	0	0	
		Prepared		0	0	0	0	0	0	0	0			0	0	0	
		Consumer		0	0	0	0	0	0	0	0			2.2	0	0	
December 7 202																	
4	<-Day of Week	Received		0	0	0	0	0	0	0	0			0	0	0	
		Prepared		0	0	0	0	0	0	0	0			0	0	0	
		Consumer		0	0	0	0	0	0	0	0			0	0	0	
December 8 202																	
5	<-Day of Week	Received		0	0	0	0	0	0	0	0			0	0	0	
		Prepared		0	0	0	5.475	0	0	0	0			0	0	0	
		Consumer		0	0	0	0	0	0	0	0			0	0	0	
December 9 202																	
6	<-Day of Week	Received		0	0	0	0	0	0	0	0			0	0	0	
		Prepared		3	0.5	2	0	0.858	1.125	0	0	3		0	0	0	
		Consumer		0	0	0	0	0	0	0	0			0	0	0	
December 10 20																	
7	<-Day of Week	Received		0	0	0	0	0	0	0	0			0	0	0	
		Prepared		0	0	0	4.1	0	0	0	0			0	0	0	
		Consumer		0	0	0	0	0	0	0	0			0	0	0	

References

Williams, P., & Walton, K. (2011). Plate waste in hospitals and strategies for change. E-SPEN, the European e-Journal of Clinical Nutrition and Metabolism, 6(6), e235-e241. https://doi.org/10.1016/j.eclnm.2011.09.006