New York State Pollution Prevention Institute

Grocer Best Practices

for identifying and measuring food waste

1 Introduction

After conducting multiple food waste studies at medium to large NY food waste generators (hospitals, grocers, universities, and catering event venues), New York State Pollution Prevention Institute (NYSP2I) developed a 12-step Food Waste Self-Assessment How-to Guide (How-to Guide). To address the unique needs of grocers and food retailers, NYSP2I developed three (3) additional resources; a printable **Grocer Log Sheet** to use during the assessment, this **Grocer Best Practices** document, and a Microsoft Excel **Grocer Results** file.

This Grocer Best Practices document expands upon the How-to Guide by providing:

- Guidance for successfully using the **Grocer Log Sheet**, including examples.
- Food waste study **best practices** for grocers and other food retailers.
- Instruction and examples on how the **Grocer Results file** may be successfully used.

2 Why conduct a food waste self-assessment?

- Knowing the source, loss reason, and amount of food waste helps identify opportunities to reduce the waste and purchasing/disposal costs.
- Retail organizations have food scraps in their waste streams that are easily collected. For example, the produce department's culling or trimmings are typically free of non-food waste making recycling options, such as composting, a feasible option.
- Food waste that cannot be reduced could otherwise be diverted from landfill. Surplus (overproduction) food may be donated, bringing possible tax benefits and increasing community relations. Food scraps may be recycled by composting or anaerobic digestion, turning the waste into useful products such as fertilizer or electricity. Additional resources and information are available on NYSP2I's Food Waste Diversion program page.
- Sustainable business practices provide an opportunity to attract and retain environmentally conscious customers.

3 Grocer Log Sheet – Guidance and examples

Studying Grocer food waste requires different approaches for pre-consumer waste (e.g. culled product, some of which is packaged, as well as food prep waste) and post-consumer waste (e.g. from the store's café). NYSP2I developed the following log sheet after pilot studies at three separate grocery stores. This section details how to use the **Grocer Log Sheet** in a study. Figure 1 is an example of a **Grocer Log Sheet**.

Grocer Log Sheet

Facility Name: Best Grocers Date: 11-30-2016 Observers Name(s): T. Smith, A. Jones

Time or Meal Service - E.g. 9:00 or Lunch	**Time frame (hrs.)** - 12 hrs. - 72 hrs. - May leave blank if 24 hrs.	**Source Location** (Department) - produce - bakery - dairy - deli - meat - seafood - cheese - prepared - other1-2	**Disposal Method** - donation - compost - rendering - animal feed - anaerobic digestion - landfill - other	**Loss Reason** - prep waste - expired - plate waste - surplus - contamination - return - other	**Food Description** - What is it? - E.g. Lettuce, vegetable mix, apples, turkey burgers, cheddar cheese, etc.	**Empty Container Weight (lbs.)** - Tare Weight of container	**Total Weight (lbs.)** - Weight of food and weighing container together	**Notes - Any additional relevant information or observations** - Item could be donated or composted - Item was not past the sell by date - Number of customers - Number of trays counted - Production information, e.g. Seafood is trimmed and packaged twice per week. - Etc.
Breakfast		prepared	compost	expired	Scrambled eggs, sausage, pancakes from serving line	2	6	Leftover from breakfast
Breakfast		prepared	compost	prep waste	Eggs, pancake batter	2	3.5	Pan scrapes from kitchen
9:00	12 hrs.	produce	compost	prep waste	Watermelon rinds from cut fruit	2	32	Cut fruit runs 5 days per week.
9:00	12 hrs.	produce	compost	prep waste	Lettuce	2	3.2	Morning culling / trimming only (1/2 day)
9:05	12 hrs.	produce	compost	prep waste	Strawberries	2	8.5	
9:05	12 hrs.	produce	anaerobic digestion	prep waste	Cabbage	2	10	
9:10	12 hrs.	produce	compost	prep waste	Carrots, peppers	2	9.2	
9:10	72 hrs.	produce	donation	surplus	Sliced watermelon	1	29	Prepped every third day
12:00		bakery	donation	surplus	Donuts, bread, rolls	2	14	Full day of donations
12:00		bakery	compost	prep waste	Dough	0	.5	Partial bag
12:00		bakery	compost	expired	Dough	0	1	1 bag
12:00		meat	rendering	prep waste	Meat ends, trimmings	2	12	
12:00		deli	compost	prep waste	Slices – customer thickness samples	2	5	
Lunch		prepared	compost	prep waste	Chicken fingers	2	5.8	
Lunch		prepared	compost	prep waste	French fries	2	3.6	
Lunch		prepared	landfill	plate waste	Fries, chicken fingers, wings, subs	2	18	2 trash bags
Lunch		prepared	donation	surplus	Rotisserie chicken	0	3.2	To be frozen

Figure 1: Grocer Log Sheet (example of printable log sheet)

3.1 Log Sheet – Time or Meal Service

In the Figure 1 example, the prepared foods section serves breakfast, lunch and dinner. Record the meal service type (i.e. breakfast, lunch, dinner) in the left most column of the log sheet. The approximate time at which the data is recorded is also important. If there are issues that come up about the data later on, the timestamp can help your team recall what happened during the period in question.

3.2 Log Sheet - Timeframe Details

Timeframe is the hours of production studied. In the Figure 1 example, the produce department performs a culling twice per day. In the example, the produce culling's / trimmings (prep) are

captured for the morning but missed in the afternoon, therefore the timeframe for these log sheet entries is 12 hours (½ day).

3.3 Log Sheet - Source Location (Department) Details:

The **Source Locations** recorded on the log sheet include typical departments for grocers and food retailers:

Time or Meal Service - E.g. 9:00 or Lunch	**Time frame (hrs.)** - 12 hrs. - 72 hrs. - May leave blank if 24 hrs.	**Source Location** (Department) - produce - bakery - dairy - deli - meat - seafood - cheese - prepared - other1-2	**Disposal Method** - donation - compost - rendering - animal feed - anaerobic digestion - landfill - other	**Loss Reason** - prep waste - expired - plate waste - surplus - contamination - return - other
Breakfast		prepared	compost	expired
Breakfast		prepared	compost	prep waste
9:00	12 hrs.	produce	compost	prep waste

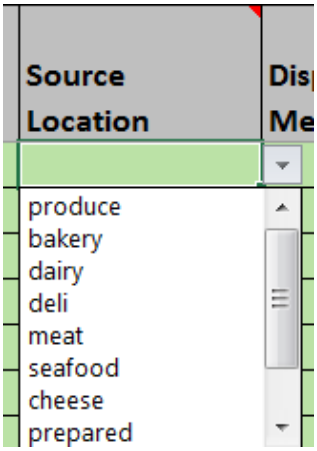

Figure 2: Grocer Log Sheet (Left) and Grocer Results File (Right)

In addition to typical departments found in a grocery store, there are 'other1' and 'other2' options in the Grocer Results File (Figure 2). Use the 'other1' or 'other2' source location to identify:

- A specific section of a department, such as Sushi, Salad Bar, Pizza Counter, etc.
- Grocery waste (i.e. packaged goods).
- Any other source that is not already on the list.

3.4 Log Sheet weights – use net weight where possible, group similar items

The standard method for weighing items is to use an available container, such as a 5-gallon bucket, to gather similar food waste items into and weigh. After weighing and recording, the waste can be disposed of as usual.

To record the weight of packaged items, first look for a net weight listed on the packaging, as shown in Figure 3. Record multiples of the same packaged item on the same line and note the number of packages in the Notes column (e.g. 10 packs of sliced apples). Since these are net weights, the container weight should be recorded as 0 lbs.

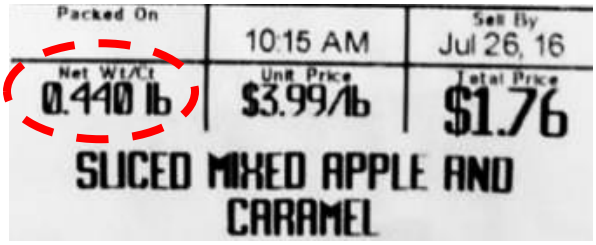

Figure 3: Example of net weight

3.5 Log Sheet – Measuring and recording donations

When measuring food set aside for donation, follow standard food safety procedures. Suggested measurement practices include weighing and recording items for donation where they are currently stored. **Do not** de-package them. Clean the scale before weighing donated items. Recording estimates based on a visual count and proxy weights is another alternative for recording donation amounts.

Note if the donated items are from one day or the accumulation of several days in the **Timeframe** column. As seen in Figure 1, the donations were (3) days' worth of produce, a **Timeframe** of 72 hrs.

3.6 Log Sheet – Recording prepared foods waste – taking a representative sample.

The key metric for prepared foods waste is **total waste per meal (lbs.)**. For example, the prepared food area is open daily from 7am to 7pm. It is possible to calculate waste for the entire day by measuring only twice: after breakfast (e.g. 10am) and after lunch (e.g. 3pm), and then assuming the waste for dinner would be the same as lunch, as illustrated in Figure 4 and Figure 5. This is a good strategy to reduce the time needed for the assessment.

Grocer Log Sheet

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Breakfast		prepared	compost	expired	Scrambled eggs, sausage, pancakes from serving line	2	6	Leftover from breakfast
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9:10	12 hrs.	produce	compost	prep waste	Carrots, peppers	2	9.2	
9:10	72 hrs.	produce	donation	surplus	Sliced watermelon	1	29	Prepped every third day
12:00		bakery	donation	surplus	Donuts, bread, rolls	2	14	Full day of donations
12:00		bakery	compost	prep waste	Dough	0	.5	Partial bag
12:00		bakery	compost	expired	Dough	0	1	1 bag
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Lunch		prepared	compost	prep waste	Chicken fingers	2	5.8	
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Lunch		prepared	landfill	plate waste	Fries, chicken fingers, wings, subs	2	18	2 trash bags
Lunch		prepared	donation	surplus	Rotisserie chicken	0	3.2	To be frozen

Figure 4: Example log sheet

This assumption needs to be accounted for in the Grocer Results File, and can be done easily by coping and pasting the Lunch information, then changing the Time / Meal Service to Dinner, as seen in Figure 5.

LOG SHEET - Study Data

Time / Meal Service	Time Frame (hrs) - leave blank if 24	Source Location	Disposal Method	Loss Reason	Food Description	Container Weight (lbs)	Total Weight (lbs)	Notes
Lunch		prepared	compost	prep waste	Chicken fingers	2.0	5.8	
Lunch		prepared	compost	prep waste	French fries	2.0	3.6	
Lunch		prepared	landfill	plate waste	Fries, chicken fingers, wings, subs	2.0	18	
Lunch		prepared	landfill	surplus	Rotisserie chicken	0.0	3.2	
Dinner		prepared	compost	prep waste	Chicken fingers	2.0	5.8	Same as lunch
Dinner		prepared	compost	prep waste	French fries	2.0	3.6	Same as lunch
Dinner		prepared	landfill	plate waste	Fries, chicken fingers, wings, subs	2.0	18	Same as lunch
Dinner		prepared	landfill	surplus	Rotisserie chicken	0.0	3.2	Same as lunch

Figure 5: Grocer Log Sheet - prepared foods dinner - copied and pasted from lunch

4 Grocer Food Waste studies – best practices

The following sections describe the best practices for assessment logistics. These guidelines directly relate to **Step 2: Define Assessment Logistics** within the How-to Guide. The titles of each section provide reference to the corresponding step number within the guide, e.g. **4.1 Logistics – Assessment length and date** is related to **Step 2a** in the **How-to Guide**.

4.1 Logistics – Assessment length and date (2a)

Typical assessments will take 3-8 hours to capture 24 hours of waste. Not all of this is active time; staff may work on other activities in between measurements. A best practice is to hold the previous evening's waste, and then sorting and measuring it during the assessment day.

4.2 Logistics – Collection plan (2b)

Collecting by grocery department is the easiest way to collect and track food waste items to the source. Measure items for donation where they are stored to maintain food safety.

4.3 Logistics - Locating space for the assessment (2c)

The assessment location should ideally be set-up near the compactor or another trash collection area. This is convenient as well as reduces the chance that food waste is disposed of before measurement. It may be more convenient to find space to perform the assessment outside in a shaded area near the trash collection area, weather permitting.

4.4 Logistics – Schedule (2d)

Either set the schedule to measure each department at a separate time, or identify the dropped off waste by department. The produce department is typically the largest source of food waste due to regular trimming and culling activity, and oftentimes will need to be measured at several times.

4.5 Logistics - Determining number of people (2e)

Generally, 2-3 people are required to sort, record, and weigh waste. More details are available in the How-to Guide.

5 Grocer Results file

The **Grocer Results File** is used to calculate food waste averages and to identify trends and focus areas for improvement efforts. To obtain results, enter the data from the log sheet recorded during the assessment and a few store/sales data and the file will do the rest, as described in more detail below.

The file is broken up into several Tabs that are shown in the following sections.

5.1 Instructions tab

The **Instructions** tab provides step-by-step instructions on using the file (Figure 6).

Figure 6: Instructions Tab

6 Grocer Results File – entering the assessment information

The Excel Grocer Results has two tabs for data entry and the remainder to summarize the results. The two tabs to enter information onto are the **Customer Info** and **Log Sheet** tabs.

6.1 Customer Info tab

Sales volume information is required to calculate the results, and is entered onto the **Customer Info** tab. Required entries are colored green as seen in Figure 7. To increase the accuracy of the data, provide the optional information on previous weeks' sales values.

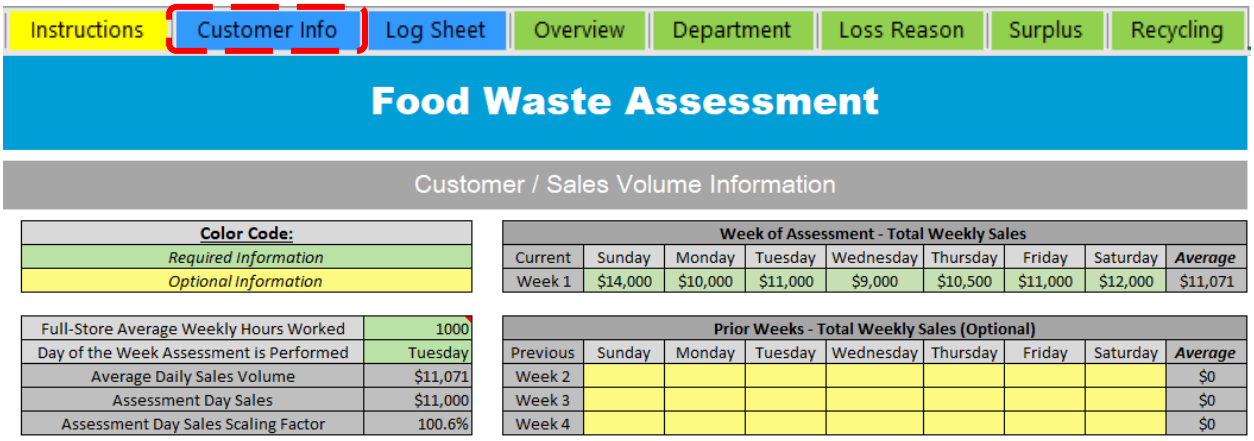


Figure 7: Customer Info Tab

6.2 Log Sheet tab

The information contained within the remaining tables and figures were generated from the content in the **Grocer Log Example**. The file mimics the paper log sheet and contains all the same columns as shown below in Figure 8.

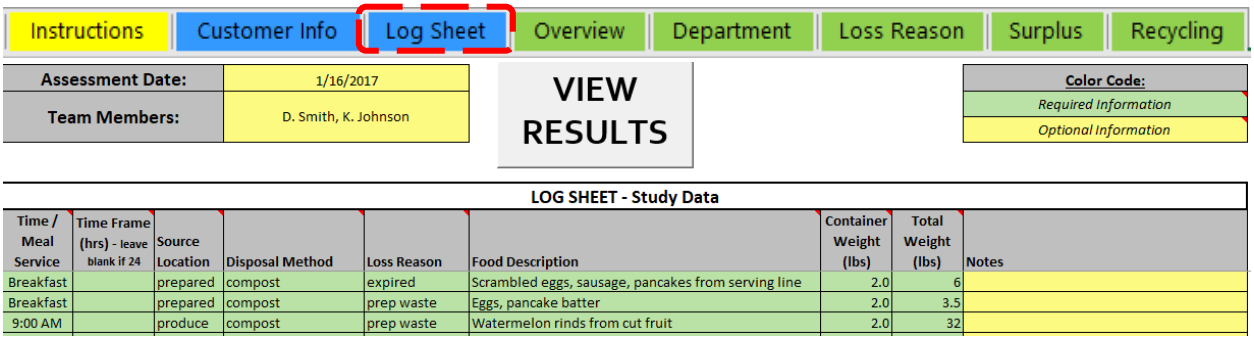


Figure 8: Log Sheet Tab

Note that the Source Location, Disposal Method and Loss Reason columns have drop-downs boxes. An example drop-down is shown above in Figure 2.

7 Grocer Results File - Viewing Results

After entering the assessment data in the **Log Sheet** tab, the **Overview** tab (Figure 9) provides the summary of the results.

7.1 Overview Tab

The first section shows the average daily, weekly, monthly and yearly food waste generation amounts in units of pounds (lbs.) and tons.

Instructions | Customer Info | Log Sheet | Overview | Department | Loss Reason | Surplus | Recycling

Food Waste Assessment Results

Summary Information

Total Food Waste Generated

Summary	lbs	tons
Daily Food Waste	219	0.1
Weekly Food Waste	1,530	0.8
Yearly Food Waste	79,768	39.9

Disposal Summary (lbs)	per day	per week	per month	per year	percent
Landfilled Food	39	271	1,176	14,107	18%
Donated Food	81	564	2,449	29,390	37%
Recycled Food	99	696	3,023	36,272	45%
Total	219	1,530	6,647	79,768	100%

Figure 9: Summary Results from Overview Tab

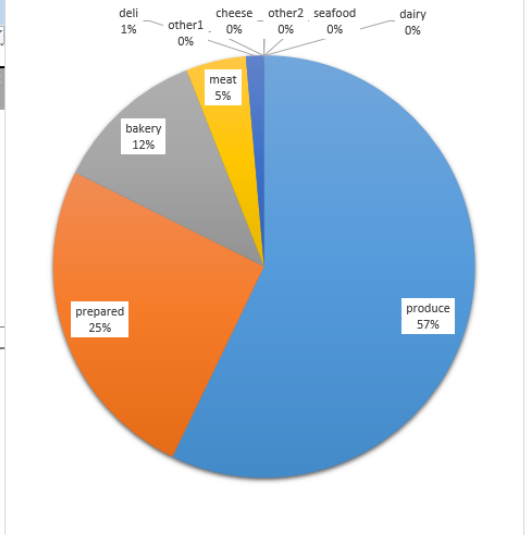
Along with the total waste generation amount, the results by department, disposal method (landfill, donated, recycled) and loss reason (food prep, surplus, expired, etc.) are calculated and summarized as shown in Figure 10. Additional summary charts and tables are included in the **Overview** tab. The figure below shows a subset for illustrative purposes. Note, the results are scaled by the timeframes values from the log sheet as well as the weekly sales numbers.

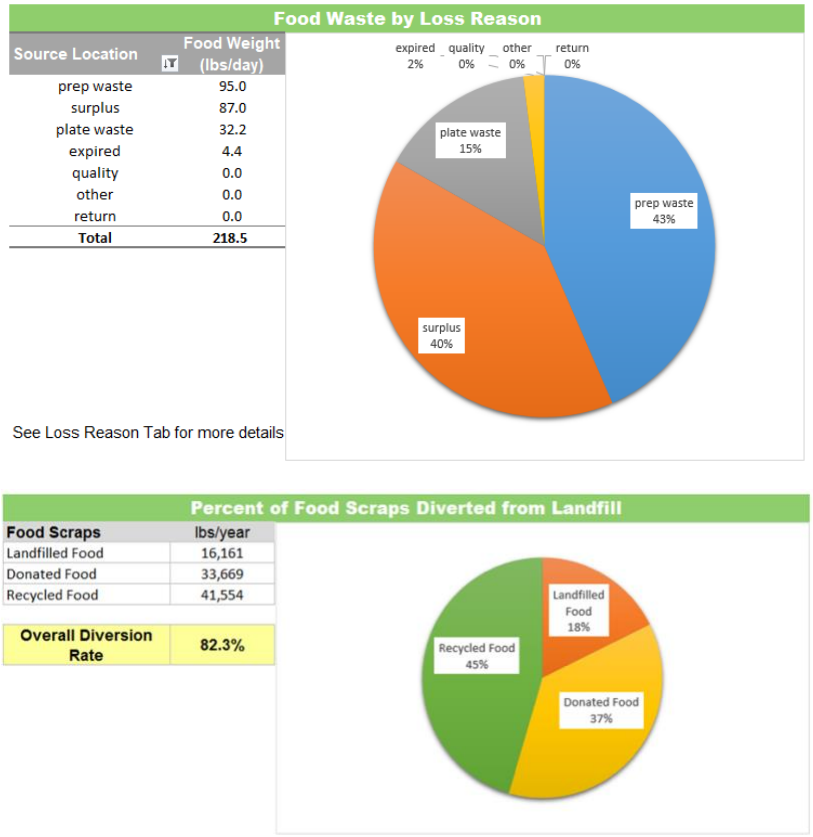
Total Food Waste Distribution by Department

Percent of Total	100%
Disposal Method	(Multiple Iten

Source Location	Food Weight (lbs/day)
produce	124.9
prepared	55.1
bakery	25.5
meat	10.1
deli	3.0
other1	0.0
cheese	0.0
other2	0.0
seafood	0.0
dairy	0.0
Total	**218.5**

See Department Tab for more details





Food Waste by Loss Reason

Source Location	Food Weight (lbs/day)
prep waste	95.0
surplus	87.0
plate waste	32.2
expired	4.4
quality	0.0
other	0.0
return	0.0
Total	**218.5**

See Loss Reason Tab for more details

Percent of Food Scraps Diverted from Landfill

Food Scraps	lbs/year
Landfilled Food	16,161
Donated Food	33,669
Recycled Food	41,554
Overall Diversion Rate	**82.3%**

Figure 10 - Results from the Overview Tab

At the end of the **Overview** tab is a comparison of the facilities average food waste to the research-based estimated food waste for grocers similar in size. The estimate (Figure 11) utilizes the full-time equivalent employees and information from NYSP2I's Food Waste Estimator Tool to make the comparison.

NYS Food System Sustainability Clearinghouse Estimation Tool

Actual vs. Estimated Food Waste Amounts*

	Estimated	Actual	% Above
Food Waste (tons/week)	0.9	0.9	1%

* http://www.rit.edu/affiliate/nysp2i/food/food-waste-estimator

Comparison based upon average waste per Full-time Equivalent (FTE) vs. estimated waste per FTE

Figure 11: Actual Waste vs. Research-based Estimate of Food Waste

The **Department** and **Loss Reason** tabs go into the specific details of what items came from which source and why they were being disposed of. These tabs are useful to help you identify specific food waste reduction opportunities after reviewing the results for the **Overview** tab.

7.2 Department tab

On the **Department** tab, view all the waste items that were disposed of from each department. Figure provides an example of the table included in the analysis.

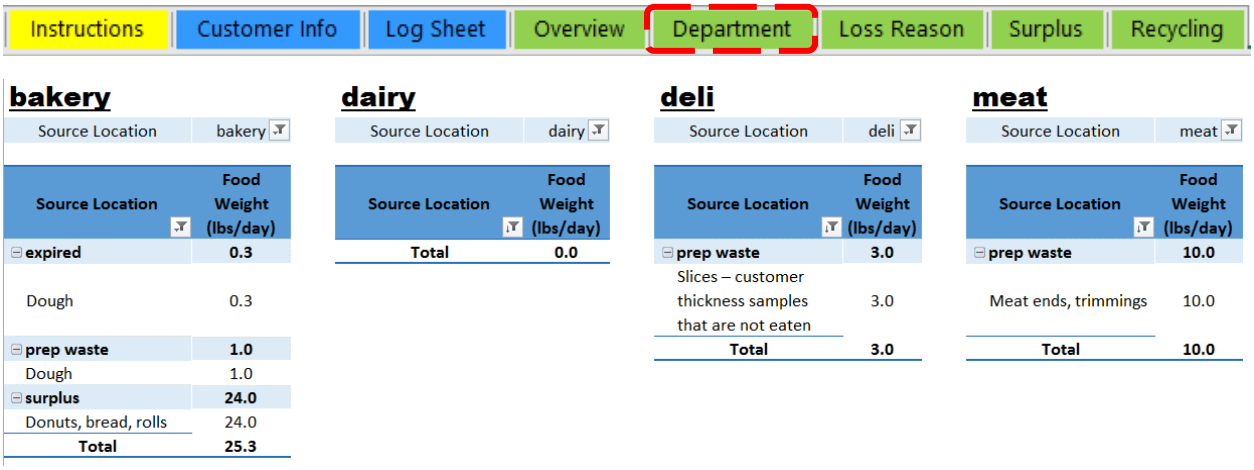


Figure 12: Department Tab

7.3 Loss Reason tab

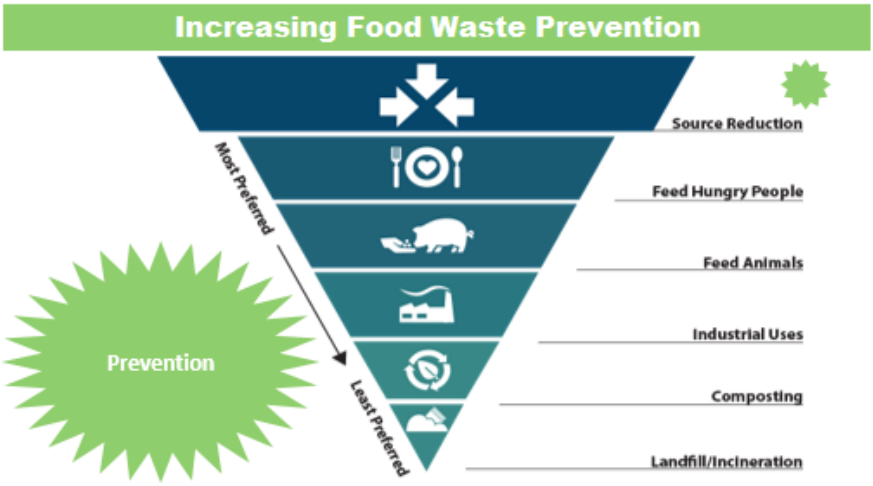
The **Loss Reason** tab, as seen in Figure , summarizes additional details on why there is waste, allowing focused improvement efforts to save money and reduce waste.

Figure 13: Loss Reason Tab

7.4 Surplus tab

The **Surplus** tab (Figure 14 and Figure 15) provides detailed information on current surplus food, highlighting opportunities to reduce prep / kitchen labor, energy and purchasing costs. Educational information and web links about donating surplus are also included.

Instructions | Customer Info | Log Sheet | Overview | Department | Loss Reason | Surplus | Recycling



Reducing food waste at the source is the best method for both reducing waste and cost. This is because making less requires less prep, kitchen labor, energy and purchasing costs, in addition to reducing disposal and handling costs. The table below identifies specific areas to focus improvement efforts on or where the menu and prep quantities may be fine-tuned.

Surplus Food Details

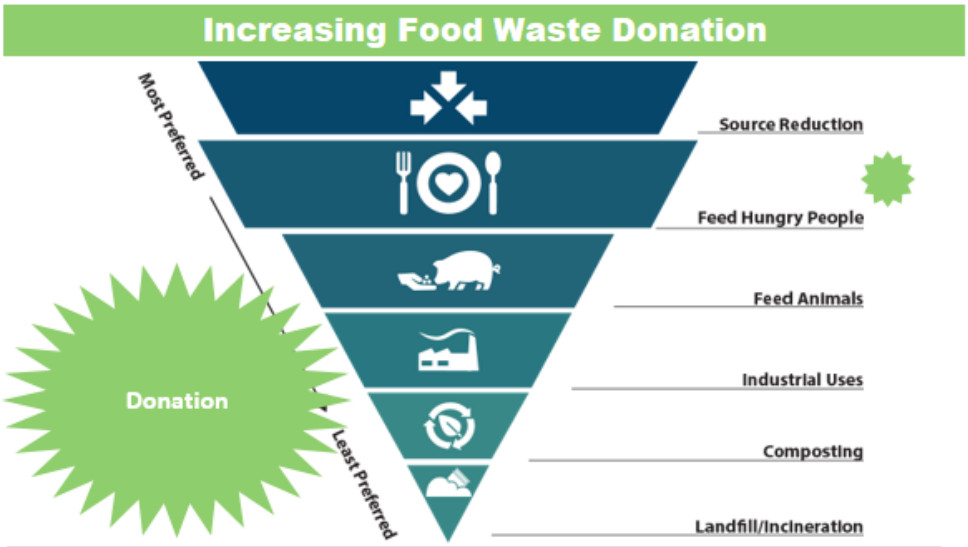
Loss Reason: surplus

Source Location	Food Weight (lbs/day)
produce	56.4
Sliced watermelon	56.4
bakery	24.2
Donuts, bread, rolls	24.2
prepared	6.4
Rotisserie chicken	6.4
Total	87.0

Surplus Food Impact

87 lbs/day
31,741 lbs/year

Figure 14: Surplus tab



Donating surplus food to those in need is the next best practice after reducing food waste at the source. This is because there are tax incentives, have a lower environmental impact than other forms of recycling wasted food, and the food goes to help hungry people in the community.

Donation Summary

	Lbs/day	Lbs/year	% Increase
Current Amount	81	29,390	-
Potential Amount	87	31,741	8

Current Donation

Disposal Method	donation

Source Location	Weight (lbs/day)
produce	56.4
Sliced watermelon	56.4
bakery	24.2
Donuts, bread, rolls	24.2
Total	80.5

Potential to Donate

Loss Reason	surplus
Disposal Method	(Multiple Items)

Source Location	Weight (lbs/day)
prepared	6.4
Rotisserie chicken	6.4
Total	6.4

Figure 15: Surplus tab

7.5 Recycling tab

The **Recycling** tab (Figure 16) provides information on how much could be recycled (food scraps) compared to the current state. Educational information / web links about recycling food are also included.

Recycling Summary

	Lbs/day	Lbs/year	% Increase
Current Recycled Amount	99	36,272	-
Potential Recycled Amount	132	48,028	32

To see compost sites, anaerobic digesters, food banks and more near you visit the Organic Resource Locator.

Current Recycling

Disposal Method (Multiple Items)

Source Location	Food Weight (lbs/day)
produce	68.5
Watermelon rinds from cu	30.2
Lettuce	1.2
Strawberries	6.5
Cabbage	16.1
Carrots, peppers	14.5

Additional Potential to Recycle

Loss Reason (Multiple Items)
Disposal Method landfill

Source Location	Food Weight (lbs/day)
prepared	32.2
Fries, chicken fingers, wings,	32.2
Total	32.2

Figure 16: Recycling tab

8 Conclusions and Next Steps

This document provided you the best practices for conducting a food waste self-assessment at your business. An example walked you through how to perform the assessment and the synergy between the systematic **How-to Guide**, the assessment day **Log Sheet**, and the **Results** file. All of files included in the Toolbox were put together based on hands on food waste assessment experience in your sector. NYSP2I is available to review the assessment results and identify potential areas in which to provide assistance.

NYSP2I collaborates with businesses, municipalities, and community organizations in New York State to identify practical, cost-effective solutions for diverting, preventing, and managing food waste. We aim to give our partners across the Empire State the tools and resources they need to solve problems associated with food waste and to build a more sustainable food system. To learn more about NYSP2I's involvement in reducing food waste, check out https://www.rit.edu/affiliate/nysp2i/services/food-waste-diversion.

9 Funding and Acknowledgement

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