Pioneer Ridge Home for the Aged

Food Waste Audit

Final Report

Prepared for the
Thunder Bay & Area Food Strategy

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1. <u>METHODOLOGY</u>

1.1 Survey Design

This project was undertaken as part of the City of Thunder Bay Materials Management Division's six local-food procurement initiatives for 2015. The goal of this survey was to learn how food travels through the system at Pioneer Ridge Home for the Aged, to identify ways it could be made more efficient so that less of the food purchased overall exists the system as waste, and to reinvest any savings into the budget for the purchase of locally-produced foods.

This study sought to learn several things, including:

- How much waste is generated from foodservice at Pioneer Ridge?
- How much of the food purchased exits the system at the inventory stage and is thrown away before it is used?
- How much is lost in preparation, as meat and vegetable trimmings, pot-skimmings, bread ends etc?
- How much exits as waste from service pans? Is there a difference in waste between meals for residents and ancillary programs?
- How much exits as plate-scrapings? Are there differences in plate waste between plazas and cafeteria? Among plazas?
- What kind of waste is being created?
- Of this waste, how much is organic and how much is non-organic?
- Of the organic waste, how much is "good compost" and how much is "other compost?"[1]
- What kind of waste is being created at each of the exits from the system?

In order to make best use of the data collected through this study, two steps were planned for sorting waste.

Pre-sorting took place at Pioneer Ridge, where waste was sorted and bagged by points of collection at Inventory, Preparation, Pan Service and Plate. Bags of food waste were tagged to identify the date, the point of collection, and the meal or time at which it was collected. The intention of this was to be able to segregate data as much as possible for later reference, allowing waste to be identified by the specific day, meal and point of its collection.

The main sorting took place at the Monty Parks Centre through a contract with their employment program. A fluctuating team of four to five Centre clients and staff was responsible for sorting and weighing the contents of each bag, and recording their findings on a separate survey sheet for each bag.

1.1.1 Survey Period

In order to coincide with the normal five-day work-week of the Monty Parks Centre team, meals were collected at Pioneer Ridge in a five-day period from Sunday afternoon snack through Friday

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[1] While any organic material will break down as compost, especially when mechanical composters are used, most vegetable gardeners avoid including items in their compost which contain meat, oil, dairy, sugars or additives or are heavily processed as these items contribute to the development of unwanted bacteria, or attract pests. See 2.3.3 for descriptions of specific "Good Compost" and "other Compost."

lunch. Under this schedule, Monty Parks Centre received the bags from Sunday afternoon and evening meals first thing on Monday morning, and finished their sorting on Friday afternoon with bags from that morning's meals.

1.1.2   Meals Surveyed

Waste was collected from meals served at Breakfast, Lunch, Afternoon Snack, Dinner and Evening Snack. The morning liquid snack (usually a serving of milk) was not surveyed.

1.1.3   Units of Measure: Weight in Kilograms

Waste was measured by weight for this study, using a digital scale accurate to one-tenth of a kilogram.

1.1.4   Pre-Sort: Points of Collection

1. **Inventory.** Pioneer Ridge performed one inventory count and rotation during the week of survey to identify Inventory Waste.
2. **Preparation.** Waste was collected from kitchen cans on the prep side of the kitchen and tagged with the date, meal and Preparation Waste location.
3. **Service/RESIDENT. Service for resident meals** takes place in the plazas. Steam trays are sent from the kitchen in sufficient quantities to allow for choices for each resident, and return to the kitchen with leftover contents. From there the contents return to inventory for re-use or exit the system as waste. Service waste from resident meals was tagged with the date, meal and Service/Resident location.
4. **Service/ANCILLARY. Service for ancillary programs** takes place in the kitchen (Meals on Wheels orders) and at satellite locations (Grace Remus Centre, Jasper Place, Pioneer Ridge cafeteria). Steam trays are sent to the satellite locations and return to the kitchen with leftover contents. Service waste from ancillary programs was collected at the dish pit and tagged with the date, meal and Service/Ancillary location.
5. **Plate Waste.** Only the plate-waste from meals served to residents in the plazas and sold in the cafeteria was available to be surveyed for this study.   Plate waste was collected at each plaza and in the cafeteria and tagged with the date, meal and Plaza1, Plaza2, Plaza3, Plaza4 or Cafeteria to identify the collection locations individually.

1.1.5   Bag Sort: Waste Composition

Monty Parks' survey team was responsible for examining each bag individually. Upon receiving each bag, the sorters copied the tag information for point of collection, meal and date onto a survey sheet prepared in advance based on the meal plan. Where possible, the tag was removed from its bag and attached to the back of the survey sheet. The bag was then sorted into categories and each category was weighed. The weight for each category was entered onto the survey sheet as well as the total bag weight overall.

1.2 Implementation

The Monty Parks Centre sorting team began the day on Monday with a set of recording sheets intended to both track bags and reduce recording time. A specific sheet had been designed for each collection point at each meal on each day of the study, assuming that only one bag would arrive from each point at

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each meal and that a bag would be sent from each point after each meal. These sheets had been pre-populated with items on the day's menu plan and blanks for item weights.

Several factors arose during the day which led us to change this method:
- More bags arrived than expected for each collection point at each meal, requiring duplicates of some pre-populated recording sheets
- No bags were sent from some collection points, leaving some sheets empty
- Some bags were tagged as being from more than one meal
- Some bags were tagged with conflicting information

In the first day of the waste survey, some gaps in understanding were discovered. Although the plan called for Service Waste for Residents to be collected in one location, at the dish pit, the collection staff at Pioneer Ridge had assumed that, like Plate Waste, Service Waste was to be collected at each Plaza. This led to some confusion with the tagging of food waste bags and rendered the set of pre-populated recording sheets unusable. It was decided to continue sorting Service Waste for Residents by plaza, to switch over to blank templates for the rest of the sorting and to rely on the Monty Parks team to identify waste categories for each bag. This placed a great deal of the onus on them to identify the foods being sorted in each bag, although they used a copy of the current Pioneer Ridge menu for reference as they made their identifications.

1.2.1   Practical Notes on Food Sorting

Although much of the food sorted during the five days of the study was identifiable as one menu item or another, the bags overall were very wet. There was significant blending of items, leading to gravy-soaked bread, egg/cereal mixes and bags which were entirely texture-modified (pureed) menu items. In these cases it was not possible to effectively separate the slurries; rather, the sorters would open the bag in order to get a visual of the contents and estimate the percentages represented, then weigh the entire bag.

In the planning of this study, we underestimated the value of a single dedicated individual supervising the pre-sorting stage at Pioneer Ridge throughout the week. It was not possible for a single Pioneer Ridge staff member to perform this function throughout the study, and as a result the pre-sorting process was not consistent from day to day and there were some gaps in the waste collection.

To improve the accuracy and detail of data in future studies of this nature, it is recommended that a dedicated staff member be scheduled extra hours to perform the pre-sorting at the institution, or an additional contractor be hired to do so. This pre-sorter at Pioneer Ridge could also potentially be tasked with segregating different pans of texture-modified foods exiting at the service stage, preventing crossover between pureed items.

1.2.2   Data Entry & Cleanup

The 222 survey sheets filled by the sorting team were entered into a spreadsheet which tracked the sheet number, date of inspection, meal day, meal, point of collection, sorting team and weight of

items sorted.   The information entered was then scrutinized against the original bag tag wherever possible to ensure accuracy of information.

1.2.3   Bag Waste Record Tracking

In order to make the data both sortable and quantifiable, entries with a value of 1 were used throughout the spreadsheet for sorting and tracking purposes. For example, entries for meals served on Monday have a 1 in the Day/Monday column only and no entry in any of the other Day columns; meals served at breakfast have a 1 in the Meal/Breakfast Meal column, meals served in Plaza 1 have a 1 in the Location/Plaza1 column only. This permits the records to be sorted by column and also quantified, to identify places in which samples are low or missing.

1.3 Data Cleanup

1.3.1 "Cafeteria" and "Service/" tag discrepancies

In part because of the staff rotation at Pioneer Ridge, there were inconsistencies in the way bag tags were filled; also, because the tags were pre-populated for ease of use, when it was decided to sort Residential Service waste by Plaza on the first day of sorting the labeling became somewhat confused.   This was addressed once all the data was entered by creating an additional Location tag for Plate Waste, so that any Plaza number became a secondary Location tag associated with either a service or a plate location tag. Labels bearing both a Cafeteria and a Plaza tag were assumed to be Plate waste. In these cases the Cafeteria tag was removed and a Plate tag added instead, so the record was clearly marked Plate and Plaza. In cases where only the Cafeteria tag was marked for the location, it was assumed that this was plate waste from the Cafeteria and a Plate tag was added. In cases where Service/Ancillary or Service Ancillary was marked together with Cafeteria, it was assumed to be service waste from the Cafeteria.

All of the Service/Resident records were then examined to ensure there were no conflicting Cafeteria or Plate tags, and all the Service/Ancillary records were checked to ensure they carried no conflicting tags from Plazas. This allowed for the confirmation of records as Ancillary or Residential service waste.

Finally, a control column was added which took an auto-sum of all the "1" tags for each record. Each record was expected to have a 1 value indicating which Date, Meal, Waste Type (Prep/Service/Plate) and Location (if indicated) was surveyed. Records with low values or high values would be examined. Low values indicated missing information; high values indicated tag conflicts. This allowed for the identification of records marked with a Plaza tag but no Cafeteria or Service tag; these were assumed to be plate waste from the plazas.

1.3.2 Identifying "Goop"

As mentioned in *Practical Notes,* above, most of the collection bags were very wet. Nearly half of all the waste surveyed was described as "goop" and given a percentage of bag content. Those records were examined individually and, where possible, the "goop" weight was distributed across the food categories based on the percentages identified in the notes. Some goop was not sortable, and was left as "goop" at the weight recorded.

1.4 Sample Size Analysis

In order to qualify the accuracy of the information gathered through the five days of collection, the bag tag information was analyzed to determine the number of bags collected by location, by meal and by day.

1.4.1   Bags Collected at Pioneer Ridge by Day

With the exception of Sunday and Friday, approximately 41 bags of waste were expected to be collected at Pioneer Ridge each day. Sunday's afternoon snack, dinner and evening (HS) snack were expected to generate 24 bags and Friday's breakfast and lunch, 17. Bag deliveries differed radically from expectations, however, in some cases being less than expected and significantly more in others.

	Collected	Anticipated	Difference
Sunday - afternoon only	10	24	-14
Monday	34	41	-7
Tuesday	54	41	13
Wednesday	46	41	5
Thursday	51	41	10
Friday - morning only	27	17	10
Total	**222**	**205**	**17**

This information allows for an assessment of the sample size. For example, only 10 of the 24 expected bags were collected for Sunday, representing a small sample which should be examined more closely to identify areas of lower-quality data.

1.4.2   Bags Delivered to Monty Parks Centre by Day

Approximately 41 bags were anticipated for each day's sorting. Although on Wednesday and Thursday there was only a slight variance, on other days of the study as many as 11 bags more or eight fewer were received than expected.   This information lets us assess the number of bags sorted each day by the Monty Parks Centre sorting team.   Tuesday and Friday were the highest-volume days; feedback from the sorting team on those days indicated that they had some difficulty sorting all the bags in the time available.

	Delivered	Anticipated	Difference
Monday	33	41	-8
Tuesday	52	41	11
Wednesday	44	41	3
Thursday	42	41	1
Friday	51	41	10
Total	**222**	**205**	**17**

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1.4.3   Number of Bags Collected by Meal

Based on five days' survey of eight collection locations, 40 bags were expected for each of the five meals to be surveyed. Although more bags were collected than anticipated overall, once records were cleaned the numbers of remaining records for afternoon snack, and evning snack were found to be extremely small, less than 10% of expected.

This low sample size occurred because not all snack waste was collected separately from other meals. Bags were marked with both afternoon snack and lunch in some cases, or afternoon snack and dinner, or evening snack and dinner. During data cleanup, tags marked with multiple meals were marked up to align with the meal from which a larger quantity of waste was recorded.   Thus snack information was often included in the records for the larger lunch and dinner samples.

On the other hand, more bags were collected overall for each meal because of the decision on Monday to split the service waste collection into five locations from the original two indicated.

	Delivered	Anticipated	Difference
Breakfast	65	40	25
Lunch	84	40	44
Afternoon Snack	3	40	-37
Dinner	65	40	25
Evening Snack	3	40	-37
Inventory (no meal)	2	5	-3
Total	**222**	**205**	**17**

1.4.4   Number of Bags Collected by Location

Based on the survey of five meals a day for five days, 25 bags were expected from each collection location over the course of the survey period. In some cases nearly twice that many were collected; in the case of prep waste this occurred because bags from multiple cans were tagged separately for the same meal. When it was decided to separate service waste by Plaza, the number of resident service bags quadrupled. However, in other cases, fewer bags were collected. For example, only 16 bags were collected for ancillary service and only seven for cafeteria plate waste. These low samples indicate places where waste may have missed collection.

	Delivered	Anticipated	Difference
Inventory	2	5	-3
Prep	46	25	21
Service/Resident	55	25	30
P1	13	25	-12
P2	11	25	-14
P3	10	25	-15
P4	17	25	-8

Service/Resident	4	0	4
Service/Ancillary	16	25	-9
Cafeteria	7	25	-18
Plaza 1 - Plate Flag	22	25	-3
Plaza 2 - Plate Flag	24	25	-1
Plaza 3 - Plate Flag	26	25	1
Plaza 4 - Plate Flag	22	25	-3
Location Unknown	2	0	2
Total	**222**	**205**	**17**

1.5 Recommendations for Improving Methodology

The methodology for this study was developed with some initial assumptions, including:

- The availability of a dedicated Pioneer Ridge staff member handling pre-sort – the collection and tagging of bags from each location after each meal
- A single bag of waste being produced for each collection location for each meal
- The ability to collect from each location at the end of each meal, segregating data by meal
- A certain level of ability to physically separate and sort food waste of this type

1.5.1 Dedicated Pre-Sort staff

At the time of this study, the City of Thunder Bay is making ready to close its other two Homes for the Aged. Pioneer Ridge will remain operational, however the impending closure of the other Homes has left the City's overall Homes for the Aged staffing in a state of flux, with staff scheduling at Pioneer Ridge changing regularly, in part to accommodate unexpected gaps at other Homes. As a result it was not possible to secure a single staff member to assure the collection and pre-sorting of waste at Pioneer Ridge. The unfortunate consequence of this was an inconsistent approach to the pre-sorting, resulting in missed collections, inconsistent labeling and meals mixed together.

To improve the accuracy and detail of data in future studies of this nature, it's recommended that a dedicated staff member be scheduled extra hours to perform the pre-sorting at the institution, or an outside contractor be hired to do so. If an outside contractor, this individual should have the opportunity to meet with staff at the Homes who are responsible for handling waste near the collection locations and assure their understanding of and cooperation with the project. The individual responsible would assure consistent tagging of bags, immediate collection following meals and would provide feedback on the number of bags being created at each collection location.

1.5.2 Sorting Wet Foods

The issue with sorting wet waste is the cross-contamination between waste items and the resulting loss of accuracy. For example, in a bag containing both bread ends and a liquid like gravy, the weight of the dry bread will be affected by the heavier gravy it has absorbed.

By the time a bag arrives at the sorting shed, this cannot be addressed; however if more accurate data is sought, a more rigorous pre-sort could be performed at Pioneer Ridge. This would likely require more than one additional staff, and would involve segregating waste items before they are mixed in the waste receptacle; for example, each service pan sent to a Plaza could be collected in a separate bag and tagged with the contents.

This would not be possible with plate waste, but would increase the overall accuracy of the data.

2. <u>ANALYSIS</u>

Data collected during the survey was examined in an effort to answer the following questions:
1. How much waste is generated from foodservice at Pioneer Ridge?
2. How much of the food purchased exits the system at the inventory stage and is thrown away before it is used?
3. How much is lost in preparation, as meat and vegetable trimmings, pot-skimmings, bread ends etc?
4. How much exits as waste from service pans? Is there a difference in waste between meals for residents and ancillary programs?
5. How much exits as plate-scrapings? Are there differences in plate waste between plazas and cafeteria? Among plazas?
6. What kind of waste is being created?
7. Of this waste, how much is organic and how much is non-organic?
8. Of the organic waste, how much is "good compost" and how much is "bad compost?"
9. What kind of waste is being created at each of the exits from the system?

2.1 Overall Waste Surveyed

2.1.1 How much waste is generated from foodservice at Pioneer Ridge?
Over the course of the five days of survey the team sorted 222 bags of waste representing a total of 723.95kg.

Extrapolated figures based on this data:

- 144.79kg/day
- 1013.53kg/week

As not all bags were captured before leaving the system, this figure is assumed to be conservative.

2.2 Waste Described By Point Of Exit

2.2.1 How much waste was accounted for at each exit?

Waste exiting the system as plate scrapings accounted for the largest portion surveyed. Not all plate waste was successfully collected and so this figure is conservative. Of all the waste surveyed, 44% was collected at the plate exit. Service waste represented 37% of the waste surveyed, and prep waste accounted for 16%, with a nominal 1% coming from inventory.

All Waste by Point of Exit
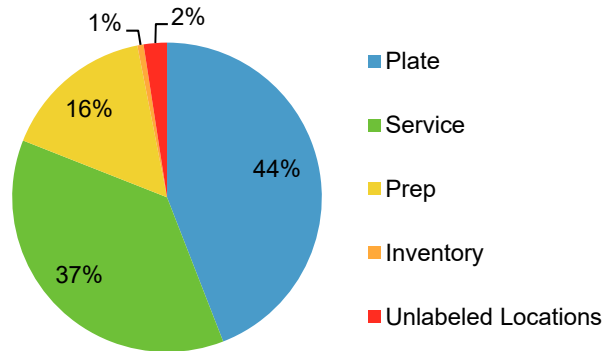
2.2.2 How much waste exits the system at the inventory stage?

Very little waste was generated at the inventory stage. Of the 723.95kg surveyed, 4.7kg or 0.65% was captured at inventory exit.

2.2.3 How much is lost in preparation, as meat and vegetable trimmings, pot-skimmings, bread ends etc?

Prep waste accounted for 115.4kg or 15.94% of all the waste surveyed.

All Prep Waste Surveyed: 115.40kg

Inventory	Prep	Service Waste (Resident & Ancillary Programs)	Plate Waste (all)	Unlabeled Locations
4.70 kg	115.40 kg	267.10 kg	319.15 kg	17.60 kg
0.65%	15.94%	36.90%	44.08%	2.43%

2.2.4 How much exits as waste from service pans? Is there a difference in waste between meals for residents and ancillary programs?

267.10kg of service waste was identified, which represents 28.44% of all the waste surveyed. There was not sufficient data collected to compare resident and ancillary pan waste.

Service Waste by Point of Exit
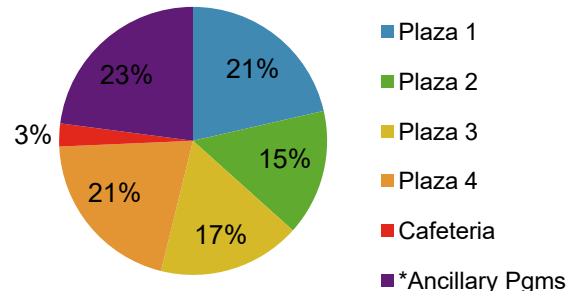
All Service Waste Surveyed: 267.10kg

Plaza 1	Plaza 2	Plaza 3	Plaza 4	Cafeteria	Ancillary Programs*
57.20 kg	40.65 kg	46.00 kg	54.65 kg	7.4 kg	61.2 kg
21.41%	15.22%	17.22%	20.46%	2.77%	22.91%

2.2.5 How much waste exits the system as plate-scrapings? Are there differences in plate waste between plazas and cafeteria? Among plazas?

Plate waste accounted for 319.05kg or 44.08% of the waste surveyed. Owing to the loss of some bags early on in the survey, this data is not comprehensive or conclusive.

Plate Waste by Point of Exit

Legend: Plaza 1, Plaza 2, Plaza 3, Plaza 4, Cafeteria
(9%, 19%, 23%, 27%, 22%)
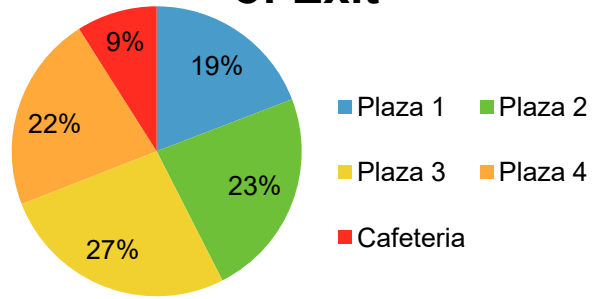
All Plate Waste Surveyed: 319.05kg

Plaza 1	Plaza 2	Plaza 3	Plaza 4	Cafeteria
61.15 kg	74.50 kg	84.80 kg	70.00 kg	28.70 kg
19.16%	23.35%	26.57%	21.93%	8.99%

2.3 Waste Described By Category

2.3.1 What kind of waste is being created overall?

The largest portion of waste surveyed was represented by the starch category, which includes bread and buns, crackers and hot and cold breakfast cereals as well as potato, pasta salad and rice. Starches accounted for 31%, or 227.11 out of the 723.95 kg surveyed.

The second-largest portion of waste surveyed is represented by paper and plastic garbage: package`ng from

All Waste by Category

Legend: Meat & Dairy, Eggs, Vegetables, Fruits, Starches, Desserts, Plastic & Paper, Goop
(15%, 4%, 12%, 4%, 31%, 1%, 18%, 15%)

preparation as well as serviettes, napkins etc. from the dining rooms. Please note that because not all plate waste was successfully collected this figure is not representative of the total non-organic

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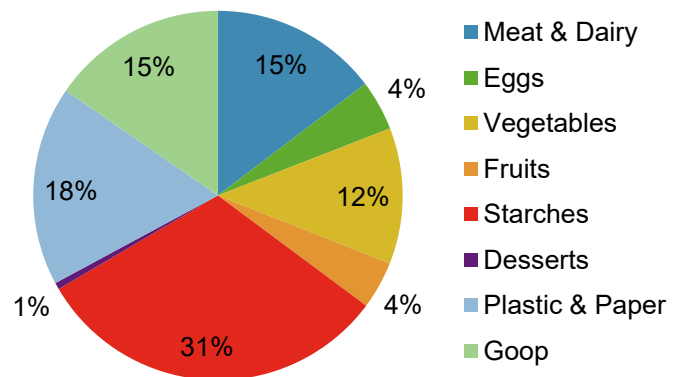
waste generated in the dining rooms. Paper and plastic waste accounted for 126.50 kg or 17.47% of all waste surveyed.

The third-largest portion of waste surveyed was found to be meats and dairy, which includes entrée meats, spaghetti & meatballs, bacon bits, cheese slices and parmesan cheese. Meats and dairy accounted for 106.35 kg or 14.69% of the waste surveyed.

All Waste Surveyed: 723.95 kg

Non-compostable	Miscellaneous	Meat/Dairy	Eggs	Vegetables	Fruits	Starches	Desserts
126.50 kg	111.45 kg	106.35 kg	31.85 kg	86.30 kg	30.15 kg	227.11 kg	4.23 kg
17.47%	15.39%	14.69%	4.40%	11.92%	4.17%	31.37%	0.58%

2.3.2 Of this waste, how much is organic and how much is non-organic?
Of the 723.95kg surveyed,

- 126.5kg or 17.47% was non-organic waste, including plastic packaging and paper items like serviettes and place mats.
- 597.45kg or 82.53% was organic waste.

2.3.3 Of the organic waste, how much is "good compost?"

Compostable Items Categorized by Compost Value

"Good Compost" Items	Weight (kg)	"Other Compost" Items	Weight (kg)
Coffee Grounds	.90	Gravy	4.53
Egg Shells	2.70	Sandwich	30.05
Bean Salad	6.47	Soup	3.43
Beets	7.59	Unsortable Goop	72.53
Broccoli	5.32	Bacon Bits	2.40
Carrots	3.21	Beef Casserole	17.15
Cauliflower	0.46	Cheese Slice	0.10
Celery	0.40	Chicken	11.37
Corn	9.45	Fish	3.05
Green & Wax Beans	3.20	Garlic Sausage	0.43
Lettuce	7.20	Liver	14.78
Mixed Veg	32.26	Parm Cheese	1.01
Peas	7.23	Pork Chop	6.90
Pickles	0.50	Riblets	4.54
Sweet Potatoes	0.20	Shrimp	6.90
Tomato	1.85	Spaghetti & Meatballs	9.43
Veg Trim	0.95	Turkey	4.30

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Fruit - Bananas, Watermelon, Strawberries etc	17.59		Veal	14.26
Fruit Cocktail	6.32		Wieners & Beans	9.73
Fruit Trim/Peel	5.50		Omelette	3.90
Bread	25.18		Scrambled Eggs	25.25
Buns	2.95		Cranberries (sauce)	0.75
Crackers	0.30		French Fries	3.55
Hot Cereal	58.37		French Toast	3.00
Potato	87.18		Mac Salad	12.80
Rice	15.93		Muffin	9.86
			Onion Rings	0.60
Total	**309.21**		Pancake Mix	3.80
			Toast (buttered)	3.60
			Cake	0.51
			Cin Bun	0.20
			Cookie	0.25
			Donut	0.75
			Pastry/Streudel	1.12
			Persians	1.30
			Pudding	0.10
			Total	**288.24**

Of the 597.45kg of organic waste surveyed,

- 309.21kg, or 42.71% of the total waste, or 51.76% of the organic waste, was "good compost."
- 288.24kg, or 39.81% of the total waste, or 48.24% of the organic waste, was "bad compost."

2.3.4 What was the composition of each category?

Starches

221.11 kg of starches were surveyed. Within this category,

- 87.18 kg of potatoes were weighed, including mashed, boiled and French-fried preparations
- 58.37 kg of hot cereal were weighed, including both Cream of Wheat and oatmeal porridge
- 25.18 kg of bread and bread ends were weighed; another 3.6 kg of buttered toast were weighed.
- 15.93 kg of cooked rice were weighed.

Starch Items by Weight (kg)

Bread	**25.18**
Buns	2.95
Crackers	0.30
French Fries	3.55
French Toast	3.00
Hot Cereal	**58.37**
Mac Salad	12.80
Muffin	9.86
Onion Rings	0.60
Pancake Mix	3.80
Potato	**87.18**
Rice	15.93
Toast	3.60
Total Starches	**227.11**

Meats & Dairy

106.35 kg of meats and cheeses were weighed. Within this category,

- 17.15 kg were recorded as beef casserole
- 14.78 kg were recorded as liver
- 14.26 kg were recorded as veal
- 11.37 kg were recorded as chicken

Please note that this category includes identified Texture Modified Foods (TMF) as well as items like Spaghetti & Meatballs or Wieners & Beans which detracts from the completeness and accuracy of the data. Some Texture Modified Foods have not been accounted for in this category as they were indistinguishable from other foods and have been labeled as "Unsortable Goop." There is some bleed-in from other categories, represented by the pasta and beans in the mixed dishes as well as the variety of ingredients in the Beef Casserole.

Meat/Dairy Items by Weight (kg)

Bacon Bits	2.40
Beef Cassserole	**17.15**
Cheese Slice	0.10
Chicken	11.37
Fish	3.05
Garlic Sausage	0.43
Liver	**14.78**
Parm Cheese	1.01
Pork Chop	6.90
Riblets	4.54
Shrimp	6.90
Spaghetti & Meatballs	9.43
Turkey	4.30
Veal	**14.26**
Wieners & Beans	9.73
Total Meats & Dairy	106.35

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Vegetables

86.30 kg of vegetables were weighed during the survey. Of this category, surveyors recorded:

- 32.26 kg of mixed vegetables.
  This figure represents both identifiable vegetable mixes served on the menus and any TMF identified as "green" or "vegetables" by the survey team and is the largest waste item surveyed in the Vegetable category. Some Texture Modified Foods have not been accounted for in this category as they were indistinguishable from other foods and have been labeled as "Unsortable Goop."
- 9.45 kg of kernel corn
- 7.59 kg of beets
- 7.20 kg of lettuce
- 7.23 kg of peas
- 0 .95 kg of vegetable trim

Vegetable Items by Weight (kg)	
Bean Salad	6.47
Beets	**7.59**
Broccoli	5.32
Carrots	3.21
Cauliflower	0.46
Celery	0.40
Corn	**9.45**
Green & Wax Beans	3.20
Lettuce	7.20
Mixed Veg	**32.26**
Peas	7.23
Pickles	0.50
Sweet Potatoes	0.20
Tomato	1.85
Veg Trim	0.95
Total	**86.30**

Fruits

30.16 kg of fresh fruit, fruit salad, cranberry sauce and fruit trim or peel were surveyed. Within this category the following four items were identified and weighed:

- 17.59 kg of fruit including bananas, strawberries and watermelon
- 6.32 kg of fruit cocktail
- 5.50 kg of fruit trim or peel
- 0.75 kg of cranberry sauce

Fruit Items by Weight (kg)	
Fresh Fruit	**17.59**
Fruit Cocktail	**6.32**
Fruit Trim/Peel	**5.50**
Cranberry Sauce	.75
Total	**30.16**

Eggs

31.85 kg of eggs were surveyed, in the form of cooked eggs (scrambled or omelette) or egg shells.

Eggs by Weight (kg)	
Scrambled Eggs/Omelette	29.15
Egg Shells	2.7
Total	**30.16**

Desserts

4.23 kg of desserts were surveyed, including cake, cinnamon buns, cookies, donuts, pastry/streudels, Persians and puddings.

Dessert Items by Weight (kg)	
Cake	0.51
Cin Bun	0.20
Cookie	0.25
Donut	0.75
Pastry/Streudel	1.12
Persians	1.30
Pudding	0.10
Total	**4.23**

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2.4 Waste Described By Category At Point Of Exit

2.4.1   What kinds of waste are being generated at each exit?

Inventory Waste – 4.70kg:

Non-compostable	Miscellaneous	Proteins/Dairy	Egg Shells	Vegetables	Fruits	Starches	Desserts
0	0	0	0	0	0	**4.70 kg**	0
0	0	0	0	0	0	**100%**	0

Waste leaving at the inventory stage included dry pancake mix and a single loaf of rye bread.

Prep Waste – 115.4kg:

Non-compostable	Miscellaneous	Proteins/Dairy	Egg Shells	Vegetables	Fruits	Starches	Desserts
59.50kg	6.55kg	5.25kg	2.70kg	**10.55kg**	8.20kg	**21.45kg**	1.20kg
51.56%	5.68%	4.55%	2.34%	**9.14%**	7.11%	**18.59%**	1.04%

The largest portion of prep waste identified was recorded as paper or plastic waste. Starches, in the form of bread ends, stale bread and potato, accounted for the second-largest amount of prep waste, and vegetables – primarily lettuce- made up the third-largest portion, followed by fruits.

In addition to the non-compostable prep waste identified through the survey, Pioneer Ridge disposes of 25 – 30 buckets ranging in size from 2L up to 20L which are not accepted for collection by the local recycler.

Residential Service Waste – 198.50kg:

Non-compostable	Miscellaneous	Proteins/Dairy	Eggs	Vegetables	Fruits	Starches	Desserts
13.60 kg	40.74 kg	43.30 kg	14.58 kg	19.27 kg	1.7 kg	65.12 kg	.20 kg
6.85%	20.53%	21.81%	7.34%	9.71%	0.86%	32.8%	0.10%

The largest portion of resident service waste identified was starches, primarily in the form of potatoes and hot cereal. All of the hot cereal was collected from the breakfast meal; most of the potatoes were collected at lunch or dinner.

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Ancillary Program Service Waste – 61.20 kg

Non-compostable	Miscellaneous	Proteins/Dairy	Eggs	Vegetables	Fruits	Starches	Desserts
1.10 kg	19.90 kg	7.63 kg	0	12.99 kg	1.28 kg	18.31 kg	0
1.80%	32.52%	12.46%	0	21.22%	2.08%	29.92%	0

The largest portion of service waste for ancillary programs was identified as "Miscellaneous", primarily unsortable mush. The second- and third-largest parts were composed of starches – primarily potatoes and rice – and vegetables, mostly corn and peas.

Plate Waste – Plazas – 290.45 kg

Non-compostable	Miscellaneous	**Proteins/Dairy**	Eggs	**Vegetables**	Fruits	**Starches**	Desserts
43.5 kg	37.06 kg	**39.49 kg**	14.58 kg	**37.48 kg**	17.59 kg	**97.99 kg**	2.77 kg
14.98%	12.76%	**13.59%**	5.02%	**12.90%**	6.06%	**33.74%**	0.95%

Approximately one third of all plate waste within the Plazas was composed of starches, primarily potato and hot cereal. Another 14.98% was composed of non-compostables including paper napkins and mats and plastic packaging.

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3. <u>OBSERVATIONS & RECOMMENDATIONS</u>

The primary concern of this study was to map the way food travels through the kitchens at Pioneer Ridge and to identify ways it could be made more efficient, generating savings.

3.1 *Inventory Waste - Minimal*

Very little waste was generated from inventory turnover; only a partial package of pancake mix and a loaf of bread of uncertain origin were discarded during this study. This indicates good inventory management as well as good-quality product from suppliers and may relate to frequency of delivery as well.

3.2 *Packaging Waste – Prep Stage*

Paper and plastic packaging, primarily from the prep area, represented nearly 18% of all the waste surveyed. This is difficult to address, as most oven-ready ingredients, whether they are ground meats, diced vegetables or peeled potatoes, require plastic packaging for freshness and safety. These prepared ingredients represent a savings in labour, and moving to less-processed or unprocessed ingredients which do not typically generate as much packaging waste could increase labour costs. If this is a concern, it could be worthwhile to explore the purchase of specialized kitchen equipment to dice, peel, grind or otherwise prepare ingredients in-house.

In addition to the packaging waste surveyed, approximately 25 food-grade plastic buckets ranging in size from 2L to 20L are disposed of by kitchen staff each week. Kitchen staff advise that the local recycling facility does not accept these buckets and that, without a regular outlet for repurposing, they go to the landfill. This could be addressed by selecting a convenient outlet and advertising the availability of clean food-grade buckets to other City divisions, partners and community members.

3.3 *Bread Ends - Prep Stage*

9.5kg of bread was identified exiting the system at the prep stage, primarily loaf ends with just a few stale or moldy loaves observed. Bread ends and stale loaves could be repurposed as bread crumbs for meatball ingredients, breaded meats and poultry stuffing.

3.4 *Hot Cereal and Potatoes - Service Stage*

The largest portion of the service waste surveyed fell within the starch category, namely potato and hot cereal from residential service collection points. Immediate savings and an accompanying reduction in waste may be possible by reducing the amounts of these items prepared for each meal.

3.5 *Texture Modified Foods – Service and Plate Stages*

There was a fairly significant amount of texture modified food collected at the plate and service waste points, indicating that some reduction may be possible. The accuracy of the data describing the pureed foods surveyed is very limited as a result of the method – visually surveying bag contents and estimating the percentage of each puree within, then weighing the bag – and it is not recommended for use as a decision-making tool, however it indicates that this area bears further study.

As described in the Implementation section of this report, it was not possible for a single Pioneer Ridge staff member to perform the pre-sorting throughout the study. To improve the accuracy and detail of

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data in future studies of this nature, it's recommended that a dedicated staff member be scheduled extra hours to perform the pre-sorting at the institution, or an additional contractor be hired to do so. As part of these duties, the pre- sorter should be tasked with segregating different varieties of texture-modified foods exiting at the service stage, preventing crossover between pureed items and improving identification.

3.6 Plate Waste

The largest portion of the waste surveyed during this study exited the system as plate scrapings. As portion sizes are based on nutritional requirements, any changes to the portions allotted for each resident must be approached with care and consideration.

Plate waste can be addressed through other methods than portion-size reduction. It may be worth considering the development of a regular foodservice survey which focuses on engaging residents with the process, creating more interest in the food itself and providing feedback on demand and preference for menu items. This kind of exercise could be conducted through the Life Enrichment program and could also potentially serve as a form of entertainment for residents as well as an engagement and information-gathering opportunity.

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4. __APPENDICES__

4.1 Kitchen System Illustration

The illustration shows a Kitchen System with the following elements:

Sort Each Bag into Categories, Weigh Out — pie chart with categories: shrinkage, veg, carbs, goop, dessert, protein. *sample categories. data can later be sorted by category, by date, by meal, by point of collection

Pre-Sort Tag — simple identifier for labour force:
- INVENTORY — Date, Time
- PREPARATION — Date, Meal
- CLIENT SERVICE — Date, Meal
- ANCIL. SERVICE — Date, Meal
- PLAZA 1 — Date, Meal
- PLAZA 2 — Date, Meal
- PLAZA 3 — Date, Meal
- PLAZA 4 — Date, Meal
- CAFETERIA — Date, Meal

Point of Collection:
- *Chris' inventory sweep* (stale, spoiled, expired etc — cannot be used) — kitchen/dining garbage cans in normal/near-normal locations
- *all kitchen cans* (trimmings, skimmings, packaging)
- *dish pit: S1 and S2* (steam tray returns — cannot be reclaimed)
- *P1, P2, P3, P4, Caf* (plate scrapings by dining area)

Food Handling Stages:
- ENTRY — we need to know how much food is being used during the survey period
- Inventory — waste → ingredients to be prepared
- Preparation — waste → cooked dishes
- Service — waste → plated meals
- Plate — waste → consumption
- ancillary programs — we need to know how much we are not able to survey

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Pioneer Ridge Waste Audit

Bag Sorting Form

Day: MON   TUES   WED   THURS   FRI

Meal: BREAKFAST   LUNCH   PM SNACK   DINNER   HS SNACK

Loc: INV   PREP   SERV/RES   SERV/ANC   P1   P2   P3   P4

Sorted By:

Total Bag Weight:

CATEGORY:

Sorted Weights:

CATEGORY:

Sorted Weights:

Notes

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