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FOOD WASTE GENERATOR STUDY



A report for the Iowa Waste Reduction Center and the Iowa Department of Natural Resources.

Produced by Strategic Marketing Services, January 2015.

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INTRODUCTION

PROJECT OBJECTIVE

Strategic Marketing Services had two primary objectives:

1. Research, identify and provide a comprehensive listing of Industrial, Commercial, and Institutional food generators in the state of Iowa; and
2. Survey a sample of the identified food waste generators regarding their food waste types and frequencies of disposal.

PROJECT METHODOLOGY

Part One: List of Iowa Food Waste Generators

The table below outlines the NAICS Codes¹ SMS used to define the generator categories identified by the Iowa Department of Natural Resources (IDNR).

Please note: there is no central government agency with the role of assigning, monitoring or approving NAICS codes for establishments. Individual establishments are assigned NAICS codes by various agencies for various purposes, using a variety of methods. Therefore, SMS used its discretion when compiling the lists contained in Attachments 2-11. What this means: there may be establishments on the prescribed lists with NAICS Codes outside of the definitions outlined below, because after further research SMS determined the establishment's primary activities were better suited to another generator category. Additionally, SMS removed establishments whose primary activities were determined to be outside of the study parameters.²

Generator Category	NAICS Definition
Colleges & Universities	611210 Junior Colleges; 611310 Colleges, Universities & Professional Schools
Convention Centers & Casinos	713210 Casinos (except Casino Hotels); 721120 Casino Hotels; 711310 Promoters of Performing Arts, Sports & Similar Events with Facilities
Correctional Facilities	922140 Correctional Institutions
Food Distributors & Wholesalers	4244 Grocery & Related Product Merchant Wholesalers
Food Manufacturers & Processors	3112 Grain & Oilseed Manufacturers; 3113 Sugar & Confectionary Product Manufacturers; 3114 Fruit & Vegetable Preserving & Specialty Food Manufacturers; 3115 Dairy Product Manufacturers; 3117 Seafood Product Preparation & Packaging; 3118 Bakeries & Tortilla Manufacturing; 3119 Other Food Product Manufacturing
Hospitals	622110 General Medical & Surgical Hospitals
K-12 School Districts	611110 Elementary & Secondary Schools
Nursing Care Facilities	62311 Nursing Care Facilities
Restaurants	722511 Full Service Restaurants; 722513 Limited Services Restaurants; 722514 Cafeterias, Grill Buffets, Buffets
Supermarkets	445110 Supermarkets and Other Grocery (except Convenience) Stores

¹ A detailed description of each NAICS Code can be found in Appendix 1 on page 24.

² A detailed list of the types of establishments that were removed can be found in Appendix 2 on page 28.



Typically, lists obtained from list vendors represent 80-90% of the market. In an attempt to capture the vast majority of the population, SMS procured lists from two reputable list sources. While there are some similarities, the list sources for each generator category vary, and are therefore delineated below:

Generator Category	List Sources
Colleges & Universities	National Center for Education Statistics; ReferenceUSA
Convention Centers & Casinos	Convention & Visitors Bureau; ReferenceUSA
Correctional Facilities	LexisNexis Academic; ReferenceUSA
Food Distributors & Wholesalers	LexisNexis Academic; ReferenceUSA
Food Manufacturers & Processors	LexisNexis Academic; ReferenceUSA
Hospitals	ReferenceUSA; Verispan
K-12 School Districts	National Center for Education Statistics; ReferenceUSA
Nursing Care Facilities	LexisNexis Academic; ReferenceUSA
Restaurants	LexisNexis Academic; ReferenceUSA
Supermarkets	LexisNexis Academic; ReferenceUSA

SMS used in-house resources to remove any and all duplicate records and establishments that were suspected to be no longer in business. While SMS cannot guarantee 100% of the market is represented on the final lists, it is our hope that going through this exercise yielded lists that are representative of approximately 95% of Iowa food waste generators within the specified categories. The total number of generators identified during this exercise is outlined in the table below.

Generator Category	Approx. No. of Generators in IA
Colleges & Universities	100
Convention Centers & Casinos	45
Correctional Facilities	112
Food Distributors & Wholesalers	109
Food Manufacturers & Processors	653
Hospitals	140
K-12 School Districts	557
Nursing Care Facilities	419
Restaurants	9,318
Supermarkets	916
Total	12,369

SMS made every attempt to populate the following categories of information for each food waste generator; however, it is important to note that some information was not available.

- NAICS code
- Business name
- Address
- Telephone number
- Website
- Geocode (Latitude and Longitude)

- Industry
- Number of employees
- Annual sales
- Square Footage
- (Colleges & Universities / K-12 School Districts) Enrollment
- (Colleges & Universities) On-campus housing population
- (Convention Centers & Casinos) Number of guests
- (Correctional Facilities) Inmate capacity
- (Hospitals & Nursing Homes) Number of beds

Part Two: Food Waste Generator Survey

SMS worked in conjunction with IWRC team members to develop a telephone recruitment script and survey instrument, approximately 10 minutes in length, designed to collect information regarding the type and frequency of food waste disposed of by generators. Topics included:

- Amount of food waste generated
 - If unable to answer this question, Food Distributors & Wholesalers and Manufacturers & Processors were also asked:
 - Approximate weight of all municipal waste
 - Approximate percentage of food waste
 - Approximate weight of food donated
 - Approximate weight of food reused or recycled
- Type of food waste
 - Pre-consumer, Post-consumer or Both
 - Fruits, Vegetables, Grains, Meat, Dairy, Other
 - Packaged, Unpackaged or Both
- Disposal method
 - Donate, Recycle, and/or Dispose
- Frequency of food waste disposal
- Miles traveled to dispose of food waste
- Interest in obtaining free food waste assistance

SMS subcontracted the telephone recruiting task to our Des Moines based partner, with whom SMS has a successful, longstanding relationship. During the recruitment effort, each generator was contacted a maximum of five times before being labeled as unresponsive. In the event that the identified point of contact was not available, SMS confirmed that the identified person was the appropriate respondent to speak with about the research topic, and/or identified any assistants, peers, or superiors who were just as qualified. Once a contact was confirmed as the best source of information, SMS attempted to make contact with that person every other day. The first three times included voicemails briefly explaining the project objective and asking for a call back. The fourth and fifth calls were simply attempts to catch the person in their office as a last effort to make contact. Due to the brevity of the study, SMS did not offer an incentive.

SMS used the data collected during Part One to categorize each generator as “Small”, “Medium” or “Large”. During this process every attempt was made to split the total sample size into thirds, allowing for an equal amount of sample in each size category; however, this was not possible in all generator categories. The size definitions are different for each category, and are detailed in the table on page 6.



Generator Category	Metric	Size Definition			Approx. No. of Generators in IA			
		Small	Medium	Large	Small	Medium	Large	Total
Colleges & Universities	Enrollment	< 150	150-1,779	1,800+	28	39	33	100
Convention Centers & Casinos	Capacity	< 2,000	2,000-3,999	4,000+	13	16	16	45
Correctional Facilities	Capacity	1-19	20-69	70+	40	42	30	112
Food Distributors & Wholesalers	Employees	1-3	4-9	10+	37	35	37	109
Food Manufacturers & Processors	Employees	1-9	10-75	> 75	359	216	78	653
Hospitals	Beds	1-25	26-99	100+	77	32	31	140
K-12 School Districts	Enrollment	1-239	240-669	670+	185	188	184	557
Nursing Care Facilities	Beds	1-49	50-74	75+	135	147	137	419
Restaurants	Employees	1-9	10-69	70+	5,232	3,910	176	9,318
Supermarkets	Employees	1-9	10-74	75+	478	287	151	916

SMS attempted to conduct interviews in accordance with the quota matrixes below. Due to the high number of generators that populate the following categories—Food Distributors & Wholesalers, Food Manufacturers & Processors, K-12 School Districts, Nursing Homes, Restaurants, and Supermarkets—SMS attempted to achieve a confidence level of $\leq \pm 9.00\%$. Achieving a confidence level of $\leq \pm 9.00\%$ in the remaining generator categories—Colleges & Universities, Convention Centers & Casinos, Correctional Facilities, and Hospitals—was unrealistic due to the low number of generators in each category. At the time this report was written, SMS conducted 654 interviews out of the 12,369 generators identified. This amount creates a statistically valid sample, achieving a $95 \pm 3.73\%$ confidence level. This means that for any ranking or rating expressed by the aggregate respondent group, if the number of responses matches, or comes very close to matching, the total of 654 responses, we can be 95% certain that the data is within plus or minus 3.73% of being accurate.³ The targeted quota, actual number of completed interviews and confidence interval for each generator category is outlined below.

Colleges & Universities (N=100)

Targeted Quota				Actual No. of Completed Interviews				Confidence Interval
Small	Medium	Large	Total	Small	Medium	Large	Total	
7	7	7	21	12	7	7	26	$\pm 16.62\%$

Convention Centers & Casinos (N=45)

Targeted Quota				Actual No. of Completed Interviews				Confidence Interval
Small	Medium	Large	Total	Small	Medium	Large	Total	
3	3	3	9	3	3	2	8	$\pm 31.77\%$

Correctional Facilities (N=112)

Targeted Quota				Actual No. of Completed Interviews				Confidence Interval
Small	Medium	Large	Total	Small	Medium	Large	Total	
8	8	6	22	11	12	6	29	$\pm 15.74\%$

³ In other words, if we were to conduct the same survey 100 times, 95 out of 100 administrations should yield results within ± 3.73 percent of the current data.

Food Distributors & Wholesalers (N=109)

Targeted Quota				Actual No. of Completed Interviews				Confidence Interval
Small	Medium	Large	Total	Small	Medium	Large	Total	
8	8	8	24	4	6	8	18	± 21.20%

Food Manufacturers & Processors (N=653)

Targeted Quota				Actual No. of Completed Interviews				Confidence Interval
Small	Medium	Large	Total	Small	Medium	Large	Total	
54	45	11	110	54	45	11	110	± 8.53%

Hospitals (N=140)

Targeted Quota				Actual No. of Completed Interviews				Confidence Interval
Small	Medium	Large	Total	Small	Medium	Large	Total	
15	6	6	27	24	6	2	32	± 15.27%

K-12 School Districts (N=557)

Targeted Quota				Actual No. of Completed Interviews				Confidence Interval
Small	Medium	Large	Total	Small	Medium	Large	Total	
37	37	37	111	37	37	37	111	± 8.33%

Nursing Care Centers (N=419)

Targeted Quota				Actual No. of Completed Interviews				Confidence Interval
Small	Medium	Large	Total	Small	Medium	Large	Total	
30	35	30	95	30	36	30	96	± 8.79%

Restaurants (N=9,318)

Targeted Quota				Actual No. of Completed Interviews				Confidence Interval
Small	Medium	Large	Total	Small	Medium	Large	Total	
62	45	10	117	64	45	10	119	± 8.93%

Supermarkets (N=916)

Targeted Quota				Actual No. of Completed Interviews				Confidence Interval
Small	Medium	Large	Total	Small	Medium	Large	Total	
52	31	22	105	52	31	22	105	± 9.00%

STUDY DEFINITIONS

- Food Waste—Any solid or liquid food substance, raw or cooked, which is discarded, intended to be discarded, or required to be discarded. Food wastes are the organic residues generated by the processing, handling, storage, sale, preparation, cooking or service of foods.
- Dispose—Send food waste to landfill, municipal waste incinerator and/or wastewater treatment plant.
- Donate—Donate food waste to food banks or other organizations that serve people in need.
- Recycle—Use food waste in animal feed, for land application or energy recovery, in a digester and/or compost the food waste.
- Pre-consumer food waste—Generated during the manufacturing or production of food prior to its being sold or served (i.e., overproduction, spoilage, etc.).
- Post-consumer food waste—Food thrown away after it has been served to the customer.



KEY TAKEAWAYS

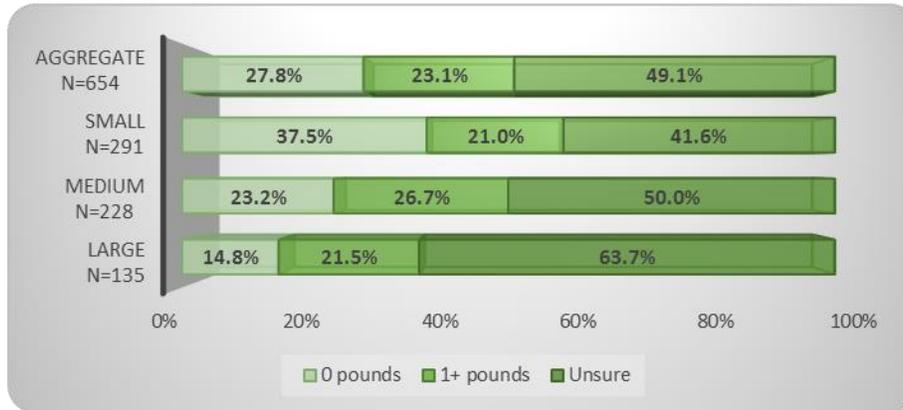
- Aggregately, 49% of generators were unsure how much food waste their facility generated during the 2013 calendar year, while about 28% of all generators reported their facility generated zero food waste during 2013.
 - The percentage of respondents who generated zero food waste decreased as the size of the facility increased, ranging from about 15% (Large) to 38% (Small).
 - The three generator categories that had the highest percentage of respondents who reported their facility generated zero food waste in 2013 were Food Distributors & Wholesalers (83%), Colleges & Universities (77%) and Food Manufacturers & Processors (66%).
- Aggregately, roughly 23% of generators were able to report how much food waste their facility generated during 2013.
 - Predictably, the mean pounds of food waste generated increased as the size of the facility increased, ranging from 12,829.82 (Small generators who generated 1+ pounds) to 167,130.17 (Large generators who produced 1+ pounds).
 - Considering only generators who produced 1+ pounds of food waste, Food Manufacturers & Producers generated the highest mean pounds (188,345.19).
- Aggregately, over half (59%) of food waste generators generated both pre-consumer and post-consumer food waste.
 - The percentage of generators who solely produced post-consumer food waste was similar for all size groups (22%-29%); however, Medium generators produced the most pre-consumer food waste (22%), while Large generators produced the least (10%).
 - The bulk of Colleges & Universities (83%), Restaurants (74%), Hospitals (69%), Nursing Facilities (64%), Convention Centers & Casinos (63%) and K-12 School Districts (58%) generated both pre-consumer and post-consumer food waste, while, logically, the greater part of Food Manufacturers & Processors (73%) and Food Distributors & Wholesalers (67%) solely generated pre-consumer food waste.
- Aggregately, the types of food waste (i.e., fruit, vegetables, grains, meat and dairy) produced by generators were mixed, with vegetables (84%) and meat (82%) being the most frequently reported types.
 - The types of food waste produced by Small, Medium and Large generators were also mixed: each food waste type was reported by 58%-90% of generators.
 - Again, the types of food waste produced by each generator category were mixed: each food waste type was reported by 11%-100% of generators.
- Aggregately, food waste generators were nearly split in half between those whose food waste was solely unpackaged and those whose food waste was both packaged and unpackaged.
 - This trend remained consistent regardless of the generator's facility size.
 - The bulk of Supermarkets (78%) and Food Distributors & Wholesalers (67%) produced both packaged and unpackaged food waste, while over half of Colleges & Universities (67%), K-12 School Districts (63%), Nursing Facilities (59%), Correctional Facilities (54%), Food Manufacturers & Processors (54%), Restaurants (53%) and Convention Centers & Casinos (50%) solely produced unpackaged food waste.
- Aggregately, the majority (89%) of food waste generators disposed of their food waste.
 - This trend remained consistent regardless of the generator's facility size.
 - The two generator categories that had the *highest* percentage of respondents who disposed of their food waste were Nursing Care Facilities (96%) and K-12 School Districts (94%), while the two generator categories that had the *lowest* percentage of respondents who disposed of their food waste were Food Distributors & Wholesalers (67%) and Food Manufacturers & Processors (62%).

- Aggregately, roughly 52% of generators had to transport the food they donated, about 37% had to transport the food they recycled and 16% had to transport the food they disposed. In general, food waste that was not transported by the respondent's facility was picked up and transported by a third party.
 - Donate
 - Generators who transported the food they donated traveled an average of 8.24 miles, one-way, ranging from 5.87 miles (Large) to 9.47 miles (Medium).
 - Considering only generators who transported the food they donated whose N size was ≥ 10 , Food Manufacturers & Processors traveled the farthest, with a mean of 9.27 miles.
 - Recycle
 - Generators who transported the food they recycled traveled an average of 26.88 miles, one-way, ranging from 18.75 miles (Small) to 38.71 miles (Medium).
 - Considering only generators who transported the food they recycled whose N size was ≥ 10 , Food Manufacturers & Processors, again, traveled farthest, with a mean of 67.58 miles.
 - Dispose
 - Generators who transported the food they disposed of traveled an average of 13.03 miles, one-way, ranging from 11.93 miles (Large) to 13.38 miles (Medium).
 - Considering only generators who transported the food they disposed of whose N size was ≥ 10 , K-12 School Districts traveled the farthest, with a mean of 14.06 miles.
- Aggregately, generators donated, recycled and/or disposed of their food waste 19.97 times in a typical month.
 - Predictably, the mean number of times a generator donated, recycled or disposed of their food waste increased as the size of the facility increased, ranging from 17.97 times (Small) to 23.55 times (Large).
 - Nursing facilities (35.49) and Hospitals (23.93) donated, recycled and disposed of their food waste the most often, closely followed by K-12 School Districts (20.03).
- Aggregately, roughly 20% of food waste generators were interested in obtaining free assistance in reducing their food waste.
 - This trend remained consistent regardless of the generator's facility size.
 - The generator categories who were most interested in obtaining free assistance in reducing their food waste were Colleges & Universities (33%), Hospitals (31%), K-12 School Districts (25%) and Supermarkets (23%).

SURVEY RESULTS

In pounds, approximately how much food waste did you generate during the 2013 calendar year? Your estimate should include any food waste that was disposed of, donated or recycled.

Aggregate



- The percentage of respondents who generated zero food waste decreased as the size of the facility increased, ranging from about 15% (Large) to 38% (Small).
- Generators who reported their facility generated zero food waste, regardless of their size, were not asked any further questions.
- Multiple respondents from each category were unsure how much food waste their organization generated during the 2013 calendar year. In these instances the respondent simply continued on with the survey *unless* they were a Food Manufacturer/Processor or a Food Distributor/Wholesaler. These two generator categories were asked four follow-up questions, which are detailed on page 22.

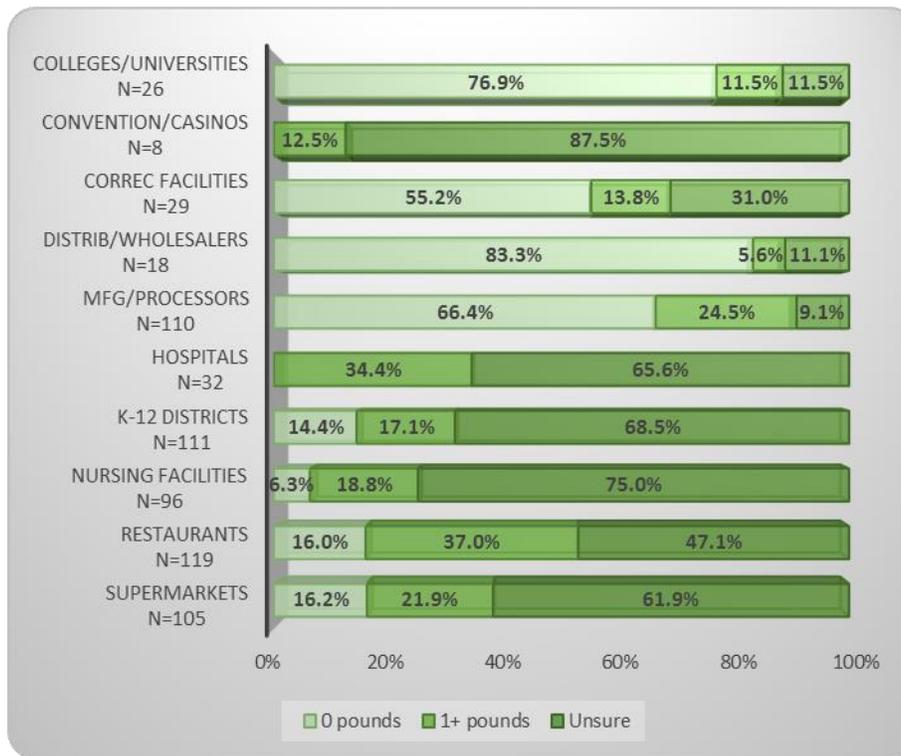
Category	All respondents			Respondents who generated 1+ pounds		
	N	Range	Mean	N	Range	Mean
Aggregate	332*	0-2,000,000	23,342.56	150*	10-2,000,000	51,664.86
Small	170	0-350,000	4,603.64	61	10-350,000	12,829.82
Medium	113**	0-500,000	18,764.03	60**	30-500,000	35,338.92
Large	49	0-2,000,000	98,913.78	29	25-2,000,000	167,130.17

*An outlier of 8,000,000 was capped to 2,000,000, the next closest amount provided by respondents

**An outlier of 8,000,000 was capped to 500,000, the next closest amount provided by respondents

- Predictably, the mean pounds of food waste generated increased as the size of the facility increased, ranging from 4,603.64 pounds (Small) to 98,913.78 pounds (Large).
- *N sizes vary widely; therefore, statistical inferences should be made with caution.*

By Generator Category



- The bulk of Colleges & Universities (77%), Correctional Facilities (55%), Food Distributors & Wholesalers (83%) and Food Manufacturers & Processors (66%) did not generate any food waste during 2013.
- Generators who did not produce any food waste, regardless of their category, were not asked any further questions.
- Multiple respondents from each category were unsure how much food waste their organization generated during the 2013 calendar year. In these instances the respondent simply continued on with the survey *unless* they were a Food Manufacturer/Processor or a Food Distributor/Wholesaler. These two generator categories were asked four follow-up questions, which are detailed on page 22.

Generator Category	All respondents			Respondents who generated 1+ pounds		
	N	Range	Mean	N	Range	Mean
Colleges & Universities	23	0-642,000	31,491.30	3	1,300-642,000	241,433.33
Convention Centers & Casinos	1	—	5,000.00	1	—	5,000.00
Correctional Facilities	20	0-400	33.75	4	25-400	168.75
Food Distributors & Wholesalers	16	0-20,000	1,250.00	1	—	20,000.00
Food Manufacturers & Processors	99*	0-2,000,000	49,464.39	26*	50-2,000,000	188,345.19
Hospitals	11	150-37,000	5,835.00	11	150-37,000	5,835.00
K-12 School Districts	35	0-25,000	3,320.63	19	20-25,000	6,116.95
Nursing Care Facilities	24	0-20,000	2,350.83	18	10-20,000	3,134.44
Restaurants	63	0-726,000	19,274.44	44	50-726,000	27,597.50
Supermarkets	40	0-300,000	16,291.55	23	10-300,000	28,333.13

*An outlier of 8,000,000 was capped to 2,000,000, the next closest amount provided by respondents

- Considering all generators whose N size was ≥ 10 , the two categories that produced the highest mean pounds of food were Food Manufacturers & Processors (49,464.39 pounds) and Colleges & Universities (31,491.30 pounds).



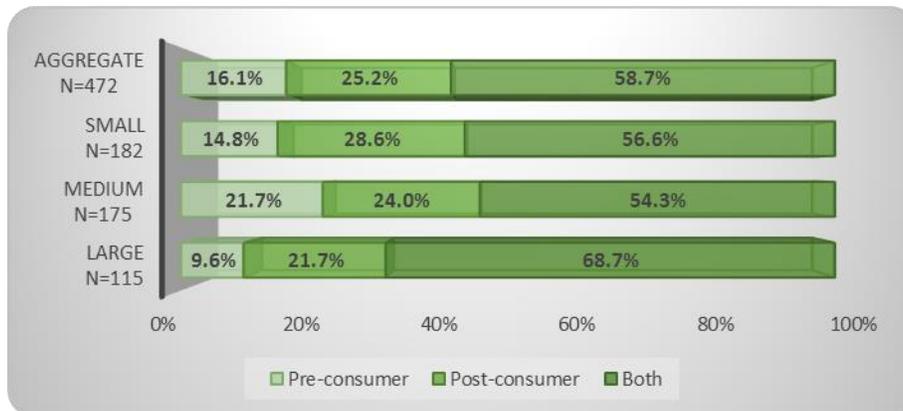
- Considering only generators who produced food waste whose N size was ≥ 10 , Food Manufacturers & Producers, by far, generated the highest mean pounds (188,345.19).
- *N sizes vary widely and some means are based on relatively low counts; therefore, statistical inferences should be made with caution.*

Other, please specify:

- Colleges & Universities
 - [None.]
- Convention Centers & Casinos
 - [None.]
- Correctional Facilities
 - [None.]
- Food Distributors & Wholesalers
 - [None.]
- Food Manufacturers & Processors
 - [None.]
- Hospitals
 - [None.]
- K-12 School Districts
 - 125 gallons/day
- Nursing Care Facilities
 - 6,000 gallons
- Restaurants
 - [None.]
- Supermarkets
 - [None.]

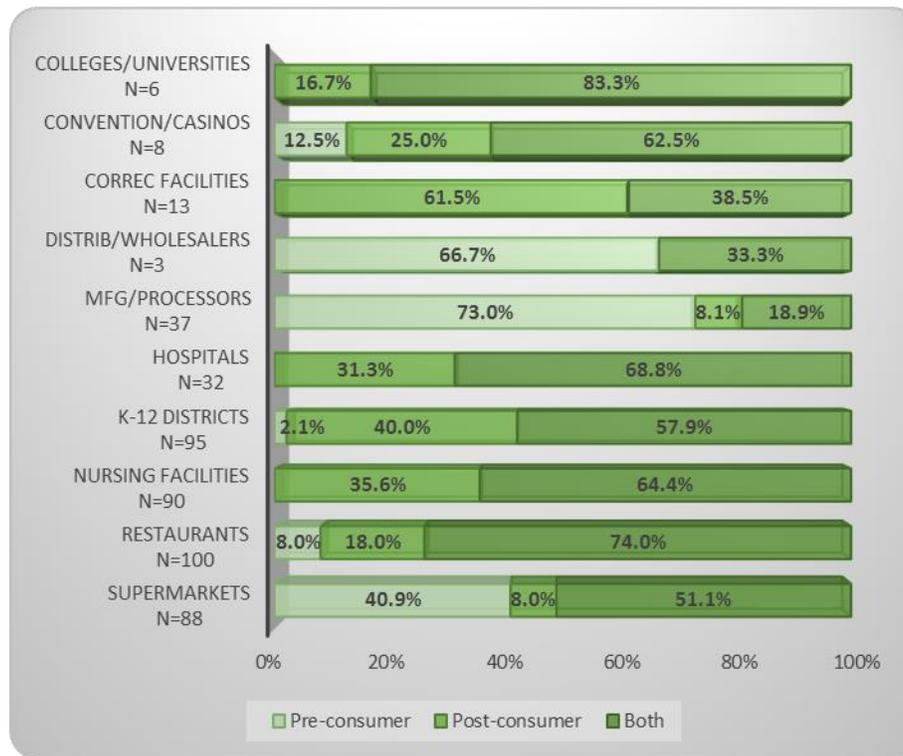
Do you generate pre-consumer food waste, post-consumer food waste, or both?

Aggregate



- Over half of food waste generators, regardless of their size, generated both pre-consumer and post-consumer food waste.
- The percentage of generators who solely produced post-consumer food waste was similar for all size groups, ranging from about 22% (Large) to 29% (Small).
- Medium generators produced the most pre-consumer food waste (22%), while Large generators produced the least (10%). Small generators were right in the middle, with 15% of respondents reporting their food waste as solely pre-consumer.

By Generator Category



- The bulk of Colleges & Universities (83%), Convention Centers & Casinos (63%), Hospitals (69%), K-12 School Districts (58%), Nursing Facilities (64%) and Restaurants (74%) generated both pre-consumer and post-consumer food waste, while, logically, the greater part of Food Distributors & Wholesalers (67%) and Food Manufacturers & Processors (73%) solely generated pre-consumer food waste.
- Nearly two-thirds of Correctional Facilities only generated post-consumer food waste.
- The food waste generated by Supermarkets varied—about 51% generated both pre-consumer and post-consumer food waste, while 41% solely generated pre-consumer food waste, leaving 8% who solely generated post-consumer food waste.
- *N sizes vary widely and some percentages are based on relatively low counts; therefore, statistical inferences should be made with caution.*

Which of the following types of food waste do you generate?

Aggregate

Category	N	Fruit	Veg	Grains	Meat	Dairy
Aggregate	472	70.6%	84.3%	64.0%	82.2%	67.6%
Small	182	66.5%	85.7%	57.7%	80.2%	63.2%
Medium	175	67.4%	78.9%	62.3%	82.3%	66.3%
Large	115	81.7%	90.4%	76.5%	85.2%	76.5%

- Aggregately, the types of food waste produced by generators was mixed, with vegetables (84%) and meat (82%) being the most frequently reported types.
- This trend remained consistent with Small and Medium generators; however, all food waste types were reported by over three-fourths of Large food waste generators.



By Generator Category

Generator Category	N	Fruit	Veg	Grains	Meat	Dairy
Colleges & Universities	6	100.0%	100.0%	100.0%	100.0%	100.0%
Convention Centers & Casinos	8	62.5%	100.0%	62.5%	75.0%	37.5%
Correctional Facilities	13	61.5%	92.3%	38.5%	76.9%	53.8%
Food Distributors & Wholesalers	3	66.7%	66.7%	66.7%	100.0%	66.7%
Food Manufacturers & Processors	37	10.8%	13.5%	35.1%	35.1%	29.7%
Hospitals	32	78.1%	84.4%	71.9%	78.1%	71.9%
K-12 School Districts	95	92.6%	100.0%	75.8%	76.8%	73.7%
Nursing Care Facilities	90	82.2%	90.0%	78.9%	95.6%	78.9%
Restaurants	100	42.0%	80.0%	60.0%	93.0%	59.0%
Supermarkets	88	89.8%	93.2%	51.1%	83.0%	76.1%

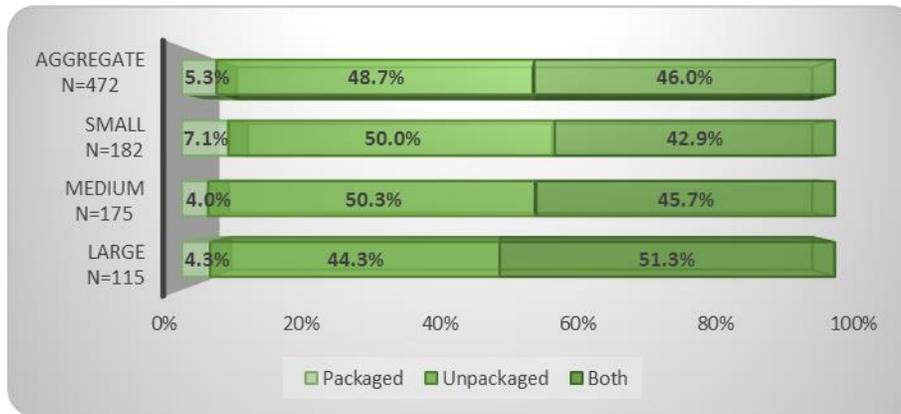
- The types of food waste produced by generators was mixed: each food waste type was reported by 11%-100% of generators, regardless of their category.
- *N sizes vary widely and some percentages are based on relatively low counts; therefore, statistical inferences should be made with caution.*

Other, please specify:

- Colleges & Universities
 - [None.]
- Convention Centers & Casinos
 - [None.]
- Correctional Facilities
 - [None.]
- Food Distributors & Wholesalers
 - [None.]
- Food Manufacturers & Processors
 - Chocolate
 - Coffee
 - Dry powder ice cream
 - Eggs/egg powder
 - Fats/oils
 - General confectionary items—peanut brittle, peanut clusters, candy, etc.
 - Liquid honey
 - Nuts
 - Soda/beverages
 - Sugar/sweeteners
 - Tortilla dough
- Hospitals
 - Whatever is left after the meal
- K-12 School Districts
 - Bones
 - Cookies/cake/sweets
 - Peelings
 - Snacks
- Nursing Care Facilities
 - Juice (3)
 - Coffee
- Restaurants
 - Fats/grease/oils (5)
 - Coffee/coffee grounds (2)
 - Frozen foods
 - Pre-made foods (sandwiches and pizza)
 - Seafood
 - Soda
 - Soups
- Supermarkets
 - Cooked/prepared food (2)
 - Beer
 - Expired canned goods
 - Dry goods/powered mixes
 - Fish
 - Frozen foods
 - General groceries

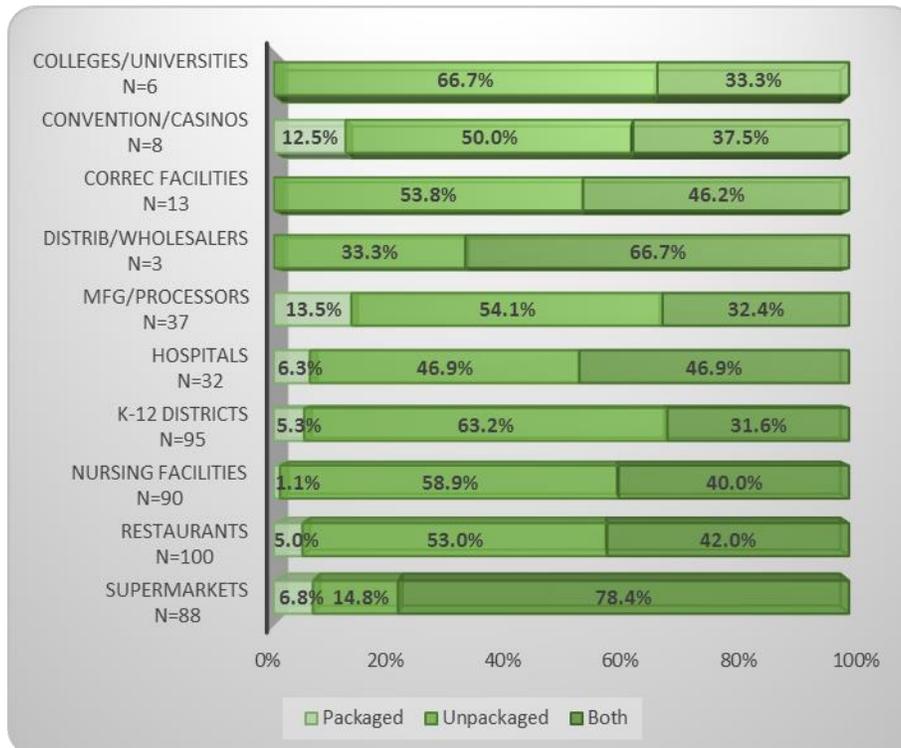
Is the food waste packaged, unpackaged, or both?

Aggregate



- Food waste generators, regardless of their size, were almost evenly split between those whose food waste was solely unpackaged and those whose food waste was both packaged and unpackaged.
- The percentage of food waste generators whose food waste was solely packaged was minimal, ranging from 4% to 7%.

By Generator Category



- The bulk of Food Distributors & Wholesalers (67%) and Supermarkets (78%) produced both packaged and unpackaged food waste.



- Over half of Colleges & Universities, Convention Centers & Casinos, Correctional Facilities, Food Manufacturers & Processors, K-12 School Districts, Nursing Facilities and Restaurants solely produced unpackaged food waste.
- Roughly 47% of hospitals solely produced unpackaged food waste, and an additional 47% of hospitals produced both packaged and unpackaged food waste.
- *N sizes vary widely and some percentages are based on relatively low counts; therefore, statistical inferences should be made with caution.*

Do you donate, recycle or dispose of your food waste?

Aggregate

Category	N	Donate	Recycle	Dispose
Aggregate	472	22.7%	24.8%	89.0%
Small	182	20.9%	20.9%	88.5%
Medium	175	19.4%	24.0%	89.1%
Large	115	30.4%	32.2%	89.6%

- The majority (89%) of food waste generators, regardless of their size, disposed of their food waste.
- Less than one-third of generators, regardless of their size, donated and/or recycled their food waste; however, slightly more Large generators donated and/or recycled compared to Small and Medium generators.

By Generator Category

Generator Category	N	Donate	Recycle	Dispose
Colleges & Universities	6	50.0%	83.3%	83.3%
Convention Centers & Casinos	8	25.0%	12.5%	75.0%
Correctional Facilities	13	0.0%	7.7%	92.3%
Food Distributors & Wholesalers	3	33.3%	0.0%	66.7%
Food Manufacturers & Processors	37	45.9%	56.8%	62.2%
Hospitals	32	15.6%	18.8%	90.6%
K-12 School Districts	95	14.7%	15.8%	93.7%
Nursing Care Facilities	90	4.4%	11.1%	95.6%
Restaurants	100	23.0%	27.0%	92.0%
Supermarkets	88	43.2%	35.2%	86.4%

- The two generator categories that had the *highest* percentage of respondents who donated their food waste were Colleges & Universities (50%) and Food Manufacturers & Processors (46%), while the two generator categories that had the *lowest* percentage of respondents who donated their food waste were Nursing Care Facilities (4%) and Correctional Facilities (0%).
- The two generator categories that had the *highest* percentage of respondents who recycled their food waste were Colleges & Universities (83%) and Food Manufacturers & Processors (57%), while the two generator categories that had the *lowest* percentage of respondents who recycled their food waste were Correctional Facilities (8%) and Food Distributors & Wholesalers (0%).
- The two generator categories that had the *highest* percentage of respondents who disposed of their food waste were Nursing Care Facilities (96%) and K-12 School Districts (94%), while the two generator categories that had the *lowest* percentage of respondents who disposed of their food waste were Food Distributors & Wholesalers (67%) and Food Manufacturers & Processors (62%).
- *N sizes vary widely and some percentages are based on relatively low counts; therefore, statistical inferences should be made with caution.*

On average, approximately how many miles, one-way, do you have to transport the food that you donate, recycle and/or dispose of?

Aggregate

DONATE

Category	All respondents			Respondents who transported		
	N	Range	Mean	N	Range	Mean
Aggregate	105	0-100	4.31	55	1-100	8.24
Small	38	0-30	5.37	23	1-30	8.87
Medium	33	0-100	4.88	17	1-100	9.47
Large	34	0-20	2.59	15	1-20	5.87

- Considering all generators, respondents traveled an average of 4.31 miles, one-way, to transport the food they donated, ranging from 2.59 miles (Large) to 5.37 miles (Small).
- Considering only generators who transported the food that they donated, respondents traveled an average of 8.24 miles, ranging from 5.87 miles (Large) to 9.47 miles (Medium).
 - In general, food waste that was not transported by the respondent's facility was picked up and transported by a third party.

RECYCLE

Category	All respondents			Respondents who transported		
	N	Range	Mean	N	Range	Mean
Aggregate	114	0-200	9.90	42	1-200	26.88
Small	37	0-90	8.11	16	2-90	18.75
Medium	41	0-150	13.22	14	1-150	38.71
Large	36	0-200	7.97	12	1-200	23.92

- Considering all generators, respondents traveled an average of 9.90 miles, one-way, to transport the food they recycled, ranging from 7.97 miles (Large) to 13.22 miles (Medium).
- Considering only generators who transported the food that they recycled, respondents traveled an average of 26.88 miles, ranging from 18.75 miles (Small) to 38.71 miles (Medium).
 - In general, food waste that was not transported by the respondent's facility was picked up and transported by a third party.

DISPOSE

Category	All respondents			Respondents who transported		
	N	Range	Mean	N	Range	Mean
Aggregate	400	0-60	2.09	64	1-60	13.03
Small	158	0-60	1.77	21	1-60	13.29
Medium	147	0-50	2.64	29	1-50	13.38
Large	95	0-40	1.76	14	1-40	11.93

- Considering all generators, respondents traveled an average of 2.09 miles, one-way, to transport the food they disposed of, ranging from 1.76 miles (Large) to 2.64 miles (Medium).
- Considering only generators who transported the food they disposed of, respondents traveled an average of 13.03 miles, ranging from 11.93 miles (Large) to 13.38 miles (Medium).
 - In general, food waste that was not transported by the respondent's facility was picked up and transported by a third party.

By Generator Category

DONATE

Generator Category	All respondents			Respondents who transported		
	N	Range	Mean	N	Range	Mean
Colleges & Universities	3	0-3	1.67	2	2-3	2.50
Convention Centers & Casinos	2	0-2	1.00	1	—	2.00
Correctional Facilities	0	—	—	0	—	—
Food Distributors & Wholesalers	1	—	100.00	1	—	100.00
Food Manufacturers & Processors	17	0-30	6.00	11	1-30	9.27
Hospitals	5	0-20	4.00	1	—	20.00
K-12 School Districts	14	0-6	2.79	10	1-6	3.90
Nursing Care Facilities	4	0-5	2.75	3	1-5	3.67
Restaurants	23	0-30	6.00	17	1-30	8.12
Supermarkets	36	0-20	1.00	9	1-20	4.00

- Considering all generators whose N size was ≥ 10 , Food Manufacturers & Processors and Restaurants traveled the farthest, one-way, to transport the food they donated—each category had a mean of 6.00 miles.
- Considering only generators who transported the food they donated whose N size was ≥ 10 , Food Manufacturers & Processors traveled the farthest, with a mean of 9.27 miles.
 - In general, food waste that was not transported by the respondent's facility was picked up and transported by a third party.
- *N sizes vary widely and some means are based on relatively low counts; therefore, statistical inferences should be made with caution.*

RECYCLE

Generator Category	All respondents			Respondents who transported		
	N	Range	Mean	N	Range	Mean
Colleges & Universities	5	0-3	0.80	2	1-3	2.00
Convention Centers & Casinos	1	—	0.00	—	—	—
Correctional Facilities	1	—	2.00	1	—	2.00
Food Distributors & Wholesalers	0	—	—	0	—	—
Food Manufacturers & Processors	21	0-200	38.62	12	3-200	67.58
Hospitals	5	0-15	4.20	2	6-15	10.50
K-12 School Districts	15	0-30	4.27	4	4-30	16.00
Nursing Care Facilities	10	0-2	0.30	2	1-2	1.50
Restaurants	26	0-90	6.88	11	1-90	16.27
Supermarkets	30	0-20	1.50	8	1-20	5.63

- Considering all respondents whose N size was ≥ 10 , Food Manufacturers & Processors traveled the farthest, one-way, to transport the food they recycled, with a mean of 38.62 miles.
- Considering only generators who transported the food they recycled whose N size was ≥ 10 , Food Manufacturers & Processors, again, traveled the farthest, with a mean of 67.58 miles.
 - In general, food waste that was not transported by the respondent's facility was picked up and transported by a third party.
- *N sizes vary widely and some means are based on relatively low counts; therefore, statistical inferences should be made with caution.*

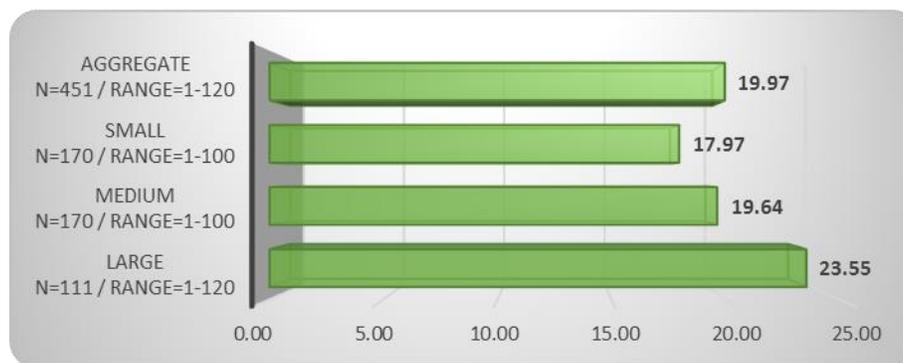
DISPOSE

Generator Category	All respondents			Respondents who transported		
	N	Range	Mean	N	Range	Mean
Colleges & Universities	5	0-1	0.20	1	—	1.00
Convention Centers & Casinos	6	—	0.00	0	—	—
Correctional Facilities	12	0-30	2.50	1	—	30.00
Food Distributors & Wholesalers	1	—	20.00	0	—	—
Food Manufacturers & Processors	22	0-15	1.91	4	2-15	10.50
Hospitals	28	0-20	2.21	5	1-20	12.40
K-12 School Districts	85	0-30	2.65	16	1-30	14.06
Nursing Care Facilities	78	0-40	1.40	8	2-40	13.63
Restaurants	90	0-60	2.21	20	1-60	9.95
Supermarkets	73	0-50	2.00	8	1-50	18.25

- Considering all respondents whose N size was ≥ 10 , K-12 School Districts traveled the farthest, one-way, to transport the food they disposed of, with a mean of 2.65 miles.
- Considering only generators who transported the food they disposed of whose N size was ≥ 10 , K-12 School Districts traveled the farthest, with a mean of 14.06 miles.
 - In general, food waste that was not transported by the respondent's facility was picked up and transported by a third party.
- *N sizes vary widely and some means are based on relatively low counts; therefore, statistical inferences should be made with caution.*

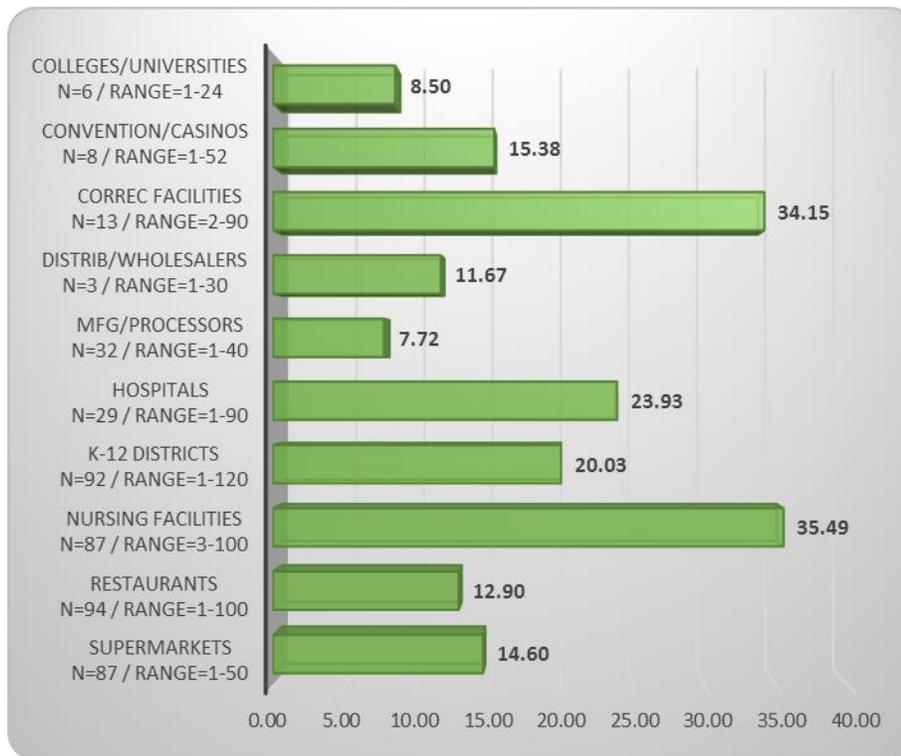
Altogether, approximately how many times in a typical month do you donate, recycle or dispose of your food waste?

Aggregate



- Predictably, the mean number of times a generator donated, recycled or disposed of their food waste increased as the size of the facility increased, ranging from 17.97 times/month (Small) to 23.55 times/month (Large).

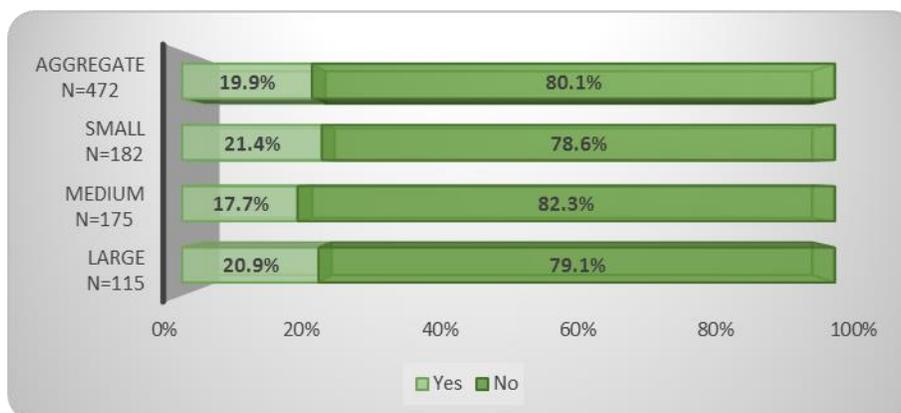
By Generator Category



- Nursing Facilities (35.49) and Hospitals (23.93) donated, recycled and disposed of their food waste the most often, closely followed by K-12 School Districts (20.03).
 - While Correctional Facilities do have the second highest mean of 34.15, the mean is based on a smaller respondent group; therefore, statistical inferences should be made with caution.
- *N sizes vary widely and some means are based on relatively low counts; therefore, statistical inferences should be made with caution.*

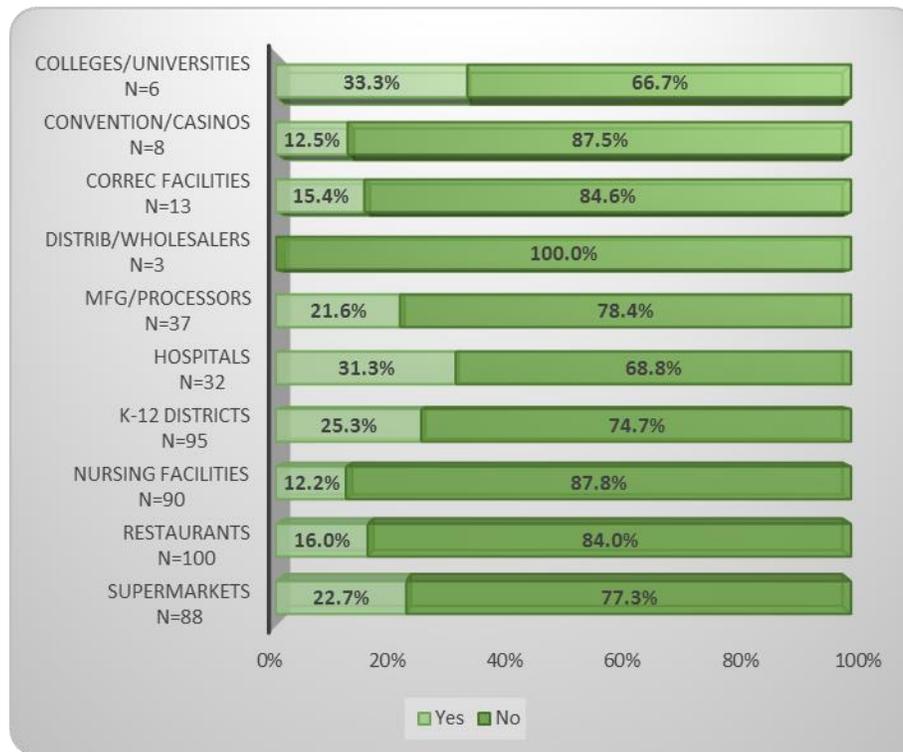
Would you be interested in obtaining free assistance in reducing your food waste?

Aggregate



- Roughly 20% of food waste generators, regardless of their size, were interested in obtaining free assistance in reducing their food waste.

By Generator Category



- The generator categories that were most interested in obtaining free assistance in reducing their food waste were Colleges & Universities (33%), Hospitals (31%), K-12 School Districts (25%) and Supermarkets (23%).
- *N sizes vary widely and some percentages are based on relatively low counts; therefore, statistical inferences should be made with caution.*



ADDITIONAL QUESTIONS—FOOD MANUFACTURERS/PROCESSORS & FOOD DISTRIBUTORS/WHOLESALERS

The questions below were asked only of respondents who were: a) unable to answer the first question (page 10); **and** b) a Food Distributor/Wholesaler or a Food Manufacturer/Processor.

In pounds, what was the total approximate weight of all municipal waste (all garbage, including waste) transported to disposal facilities such as landfills, municipal waste incinerators and wastewater treatment plants by your facility during the 2013 calendar year?

Food Distributors & Wholesalers

- *N=2 (1 Medium, 1 Large)*
- Neither respondent knew the total approximate weight of all municipal waste transported to disposal facilities by their facility in 2013. Both respondents reported their company did not track that information.

Food Manufacturers & Processors

- *N=10 (4 Small, 5 Medium, 1 Large)*
- 7 respondents did not know the total approximate weight of all municipal waste transported to disposal facilities in 2013 by their facility. 5 respondents reported their company did not track that information, while the 2 remaining respondents reported the information was not accessible and/or were unwilling to transfer the interviewer to someone who may have been able to answer the question.
- The remaining 3 respondents (2 Small, 1 Medium) reported approximately 50 pounds, 24,000 pounds and 80,000 pounds of waste were transported to disposal facilities by their facilities during 2013.
 - Mean=34,683.33. However, the mean is based on low counts; therefore, the data should be used with caution.

Approximately what percentage of that would you guess was food waste?

Food Distributors & Wholesalers

- *N=2 (1 Medium, 1 Large)*
- Neither respondent knew what percentage of their municipal waste was food waste. Both respondents reported their company did not track that information.

Food Manufacturers & Processors

- *N=10 (4 Small, 5 Medium, 1 Large)*
- 5 respondents did not know what percentage of their municipal waste was food waste. All 5 reported their company did not track that information.
- The remaining 5 respondents (3 Small, 2 Medium) reported approximately 10%, 15%, 50% and 100% (2) of their municipal waste was food waste.
 - Mean=55%. However, the percentage is based on low counts; therefore, the data should be used with caution.

In pounds, what is the total approximate weight of food donated for human consumption by your facility during the 2013 calendar year?

Food Distributors & Wholesalers

- *N=2 (1 Medium, 1 Large)*
- Neither generator donated their food waste.

Food Manufacturers & Processors

- *N=10 (4 Small, 5 Medium, 1 Large)*
- 2 respondents did not know the total approximate weight of food donated for human consumption in 2013 by their facility. 1 respondent reported their company did not track that information, while the other respondent reported the information was not accessible and/or was unwilling to transfer the interviewer to someone who may have been able to answer the question.
- Of the remaining 8 respondents (3 Small, 5 Medium), 5 reported their facility did not donate their food waste, while the other 3 reported approximately 25 pounds, 5,000 pounds and 80,000 pounds of food waste was donated by their facilities in 2013.
 - Mean=10,628.13 including all respondents, and 28,341.67 including only those who donated. However, the means are based on low counts; therefore, the data should be used with caution.

In pounds, what is the total approximate weight of food waste reused or recycled by your facility during the 2013 calendar year?

Food Distributors & Wholesalers

- *N=2 (1 Medium, 1 Large)*
- Neither generator recycled their food waste.

Food Manufacturers & Processors

- *N=10 (4 Small, 5 Medium, 1 Large)*
- 2 respondents did not know the total approximate weight of food reused or recycled by their facility in 2013. Both respondents reported their company did not track that information.
- Of the remaining 8 respondents (2 Small, 5 Medium, 1 Large), 7 reported their facility did not reuse or recycle their food waste, while the remaining respondent reported approximately 98 pounds of their food waste was reused or recycled in 2013.



APPENDIX 1: NAICS DEFINITIONS

COLLEGES & UNIVERSITIES

611210 Junior Colleges

This industry comprises establishments primarily engaged in furnishing academic, or academic and technical, courses and granting associate degrees, certificates, or diplomas below the baccalaureate level. The requirement for admission to an associate or equivalent degree program is at least a high school diploma or equivalent general academic training. Instruction may be provided in diverse settings, such as the establishment's or client's training facilities, educational institutions, the workplace, or the home, and through diverse means, such as correspondence, television, the Internet, or other electronic and distance-learning methods. The training provided by these establishments may include the use of simulators and simulation methods.

611310 Colleges, Universities & Professional Schools

This industry comprises establishments primarily engaged in furnishing academic courses and granting degrees at baccalaureate or graduate levels. The requirement for admission is at least a high school diploma or equivalent general academic training. Instruction may be provided in diverse settings, such as the establishment's or client's training facilities, educational institutions, the workplace, or the home, and through diverse means, such as correspondence, television, the Internet, or other electronic and distance-learning methods. The training provided by these establishments may include the use of simulators and simulation methods.

CONVENTION CENTERS & CASINOS

713210 Casinos (except Casino Hotels)

This industry comprises establishments primarily engaged in operating gambling facilities that offer table wagering games along with other gambling activities, such as slot machines and sports betting. These establishments often provide food and beverage services. Included in this industry are floating casinos (i.e., gambling cruises, riverboat casinos).

721120 Casino Hotels

This industry comprises establishments primarily engaged in providing short-term lodging in hotel facilities with a casino on the premises. The casino on premises includes table wagering games and may include other gambling activities, such as slot machines and sports betting. These establishments generally offer a range of services and amenities, such as food and beverage services, entertainment, valet parking, swimming pools, and conference and convention facilities.

711310 Promoters of Performing Arts, Sports & Similar Events with Facilities

This industry comprises establishments primarily engaged in (1) organizing, promoting, and/or managing live performing arts productions, sports events, and similar events, such as state fairs, county fairs, agricultural fairs, concerts, and festivals, held in facilities that they manage and operate and/or (2)

managing and providing the staff to operate arenas, stadiums, theaters, or other related facilities for rent to other promoters.

CORRECTIONAL FACILITIES

922140 Correctional Institutions

This industry comprises government establishments primarily engaged in managing and operating correctional institutions. The facility is generally designed for the confinement, correction, and rehabilitation of adult and/or juvenile offenders sentenced by a court.

FOOD DISTRIBUTORS & WHOLESALERS

4244 Grocery & Related Product Merchant Wholesalers

This industry includes: General Line Grocery Merchant Wholesalers; Packaged Frozen Food Merchant Wholesalers; Dairy Product (except Dried or Canned) Merchant Wholesalers; Poultry and Poultry Product Merchant Wholesalers; Confectionery Merchant Wholesalers; Fish and Seafood Merchant Wholesalers; Meat and Meat Product Merchant Wholesalers; Fresh Fruit and Vegetable Merchant Wholesalers; and Other Grocery and Related Products Merchant Wholesalers.

FOOD MANUFACTURERS & PROCESSORS

3112 Grain & Oilseed Manufacturers

This industry includes establishments engaged in: flour milling, rice milling, malt manufacturing; wet corn milling; soybean and other oilseed processing; fats and oils refining and blending; and breakfast cereal manufacturing.

3113 Sugar & Confectionery Product Manufacturers

This industry includes establishments engaged in: beet sugar manufacturing; cane sugar manufacturing; nonchocolate confectionery manufacturing; chocolate and confectionery manufacturing from cacao beans; and confectionery manufacturing from purchased chocolate.

3114 Fruit & Vegetable Preserving & Specialty Food Manufacturers

This industry includes establishments engaged in: frozen fruit, juice, and vegetable manufacturing; frozen specialty food manufacturing; fruit and vegetable canning; specialty canning; and dried and dehydrated food manufacturing.

3115 Dairy Product Manufacturers

This industry includes establishments engaged in: fluid milk manufacturing; creamery butter manufacturing; cheese manufacturing; dry, condensed, and evaporated dairy product manufacturing; and ice cream and frozen dessert manufacturing.

3117 Seafood Product Preparation & Packaging

This industry includes establishments engaged in seafood product preparation and packaging.



3118 Bakeries & Tortilla Manufacturing

This industry includes establishments engaged in: bread and bakery product manufacturing; retail bakeries; commercial bakeries; frozen cakes, pies, and other pastries manufacturing; cookie and cracker manufacturing; dry pasta, dough, and flour mixes manufacturing from purchased flour; and tortilla manufacturing.

3119 Other Food Product Manufacturing

This industry includes establishments engaged in: roasted nuts and peanut butter manufacturing; other snack food manufacturing; coffee and tea manufacturing; flavoring syrup and concentrate manufacturing; mayonnaise, dressing, and other prepared sauce manufacturing; spice and extract manufacturing; perishable prepared food manufacturing; and all other miscellaneous food manufacturing.

HOSPITALS

622110 General Medical and Surgical Hospitals

This industry comprises establishments known and licensed as general medical and surgical hospitals primarily engaged in providing diagnostic and medical treatment (both surgical and nonsurgical) to inpatients with any of a wide variety of medical conditions. These establishments maintain inpatient beds and provide patients with food services that meet their nutritional requirements. These hospitals have an organized staff of physicians and other medical staff to provide patient care services. These establishments usually provide other services, such as outpatient services, anatomical pathology services, diagnostic X-ray services, clinical laboratory services, operating room services for a variety of procedures, and pharmacy services.

K-12 SCHOOL DISTRICTS

611110 Elementary and Secondary Schools

This industry comprises establishments primarily engaged in furnishing academic courses and associated course work that comprise a basic preparatory education. A basic preparatory education ordinarily constitutes kindergarten through 12th grade. This industry includes school boards and school districts.

NURSING CARE FACILITIES

62311 Nursing Care Facilities

This industry comprises establishments primarily engaged in providing inpatient nursing and rehabilitative services. The care is generally provided for an extended period of time to individuals requiring nursing care. These establishments have a permanent core staff of registered or licensed practical nurses who, along with other staff, provide nursing and continuous personal care services.



RESTAURANTS

722511 Full Service Restaurants

This industry comprises establishments primarily engaged in providing food services to patrons who order and are served while seated (i.e., waiter/waitress service) and pay after eating. These establishments may provide this type of food service to patrons in combination with selling alcoholic beverages, providing carryout services, or presenting live nontheatrical entertainment.

722513 Limited Services Restaurants

This industry comprises establishments primarily engaged in providing food services (except snack and nonalcoholic beverage bars) where patrons generally order or select items and pay before eating. Food and drink may be consumed on premises, taken out, or delivered to the customer's location. Some establishments in this industry may provide these food services in combination with selling alcoholic beverages.

722514 Cafeterias, Grill Buffets, Buffets

This industry comprises establishments, known as cafeterias, grill buffets, or buffets, primarily engaged in preparing and serving meals for immediate consumption using cafeteria-style or buffet serving equipment, such as steam tables, refrigerated areas, display grills, and self-service nonalcoholic beverage dispensing equipment. Patrons select from food and drink items on display in a continuous cafeteria line or from buffet stations.

SUPERMARKETS

445110 Supermarkets and Other Grocery (except Convenience) Stores

This industry comprises establishments generally known as supermarkets and grocery stores primarily engaged in retailing a general line of food, such as canned and frozen foods; fresh fruits and vegetables; and fresh and prepared meats, fish, and poultry. Included in this industry are delicatessen-type establishments primarily engaged in retailing a general line of food.



APPENDIX 2: TYPES OF ESTABLISHMENTS REMOVED

Generator Category	Establishments Removed
Colleges & Universities	No establishments removed.
Convention Centers & Casinos	Removed any venues that could not be classified as a Convention Center or Casino (i.e., community soccer fields, football fields, meeting rooms, etc.).
Correctional Facilities	No establishments removed.
Food Distributors & Wholesalers	Any establishment that manufactured food as well as distributed food was moved to the "Food Manufacturers/Processors" list.
Food Manufacturers & Processors	Local retail bakeries were removed.
Hospitals	No establishments removed.
K-12 School Districts	List identifies K-12 private schools and K-12 public school <i>districts</i> ; the individual schools that make up each school district are not identified.
Nursing Care Facilities	Companies that offered home health and hospice care were removed.
Restaurants	Restaurants there were also included in one of the other generator categories were removed (e.g., a restaurant in a casino).
Supermarkets	Convenience stores were removed unless said store housed a restaurant (e.g., Blimpie Subs in a Casey's convenience store).