



Iowa Food Waste Reduction Program Market Analysis

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STRATEGIC
MARKETING
SERVICES

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Attachments (submitted under separate cover)

- Attachment One: Recruitment Script and Survey Instrument
- Attachment Two: Landfill Data Tables
- Attachment Three: Large Food User Data Tables

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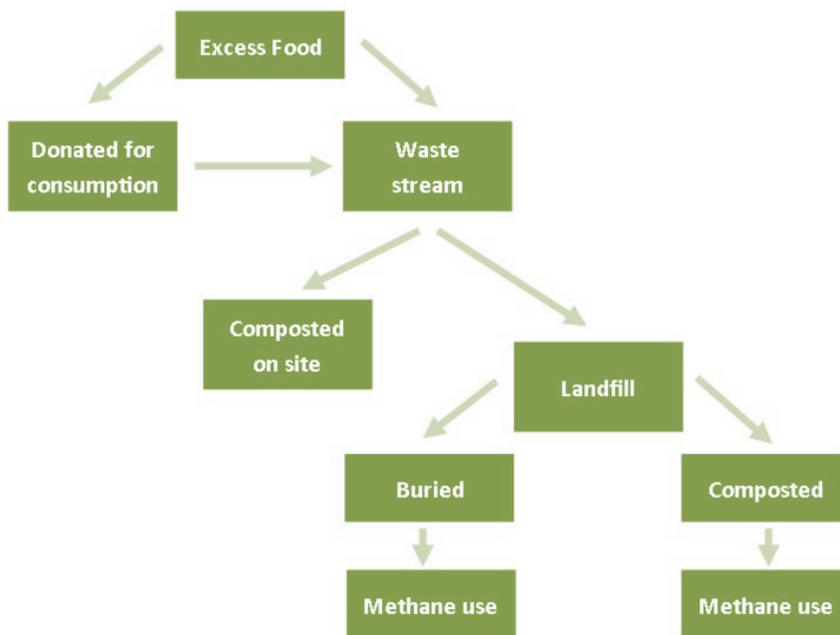
Introduction

Project Objective

Strategic Marketing Services' research objective was to assist the Iowa Waste Reduction Center (IWRC) in better understanding how Iowa landfills and other large food users manage their food waste. The IWRC will use this information to design a food waste reduction program that will work to reduce the amount of food waste that goes to Iowa's landfills, which will, in turn, also reduce methane gas emissions, increase food donation, and increase the number of landfills and other institutions who have and/or use composting sites.

Project Background

The flow chart below shows the general path of excess food.



The United States Environmental Protection Agency lists numerous environmental, economic and social benefits related to the reduction of food waste in landfills, including:¹

Environmental

- Reduce methane from landfills – When food is disposed in a landfill it rots and becomes a significant source of methane - a potent greenhouse gas with 21 times the global warming potential of carbon dioxide. Landfills are a major source of human-related methane in the United States, accounting for more than 20% of all methane emissions.

¹ U.S. Environmental Protection Agency: <http://www.epa.gov/epawaste/conservation/foodwaste/>

- Biodigesters capture methane and generate clean electrical energy; however, there are very few private permits in Iowa.
- Reduce resource use associated with food production – There are many resources needed to grow food, including water, fertilizers, pesticides, and energy. By wasting food, you are also wasting the resources that went into growing it. Additionally, 14% of greenhouse gases in the United States are associated with growing, manufacturing, transporting, and disposing of food. By reducing the amount of food wasted, we can reduce greenhouse gas emissions.
- Create a valuable soil amendment – Recycling food waste and turning it into compost has many environmental benefits such as improving soil health and structure; increasing drought resistance; and reducing the need for supplemental water, fertilizers, and pesticides. Food waste can also be turned into renewable energy and a soil amendment through anaerobic digestion.
- Improve sanitation, public safety, and health at your facility – Food waste dumped in standard trash cans and dumpsters in the back alley of a home, store or restaurant can generate bad odors and attract rodents or insects. Placing food scraps in a closed, leak-proof, durable, and reusable container, and having it frequently emptied for donation or composting can significantly reduce, and even eliminate these problems.

Economic Benefits

- Lower disposal costs – By decreasing the amount of food wasted, businesses pay less to dispose of their trash. Some haulers charge less if the food waste is separated from the trash and sent for composting rather than landfilling.
- Reduce over-purchasing and labor costs – By making strides to prevent food waste, businesses can reduce costs by purchasing only the food that will be used, or decreasing improperly prepared foods. Additionally, reducing food waste can increase staff efficiency and reduce energy and labor associated with disposing of food.
- Receive tax benefits by donating food – By donating wholesome and edible food to food banks or food rescue organizations, businesses can claim tax benefits as well as feed those in need.

Social Benefits

- Feed people, not landfills – An estimated 50 million Americans do not have access to enough food. Organizations can donate safe and healthy food to a food bank or food rescue organization and both reduce food sent to landfills and feed those in need.

Project Design

For the purposes of this study, a food waste management system was defined as anything a landfill or large food user is doing to reduce or divert their food waste. This could include, but was not limited to:

- | | |
|--|---|
| <ul style="list-style-type: none">• Landfills<ul style="list-style-type: none">• Composting• Educational programs• Methane capturing• Diversion (off-site composting) | <ul style="list-style-type: none">• Large Food User<ul style="list-style-type: none">• Source reduction (i.e., trayless dining in cafeteria, better inventory system, reducing portion sizes, etc.)• Donation• Composting |
|--|---|

In order to meet the stated objective, SMS conducted a multi-phased approach utilizing both secondary and primary research methodologies.

Secondary Research

The secondary research method worked to collect information about current food waste reduction systems by conducting an exhaustive search of all publically available literature, as well as syndicated reports, including:

- ABI/INFORM Archive (ProQuest)
- Academic OneFile (Gale)
- Academic Search Elite (EBSCO)
- ACM Digital Library
- ARBA Online (Libraries Unlimited)
- Business and Company Resource Center (Gale Cengage)
- Business Knowledge Research (Conference Board)
- Business Source Elite (EBSCO)
- Cedar Valley Library Consortium (CVLC)
- Center for Research Libraries
- CIAO: Columbia International Affairs Online (Columbia University Press)
- CQ Researcher
- Emerald
- Economic Census (U.S. Census Bureau)
- Engineering Village 2 (Elsevier)
- EDGAR
- Google Scholar
- Health Source: Consumer (EBSCO)
- Homeland Security Digital Library (Dept. of Homeland Security)
- Hoover's Company Records (ProQuest)
- IBISWorld
- LexisNexis Academic
- Marquis Who's Who
- Morning Star Investment Research Center
- Mergent Online
- Mintel Reports
- North American Industry Classification System (NAICS)
- NetAdvantage (Standards & Poor's)
- ReferenceUSA (InfoUSA)
- Regional Business News (EBSCO)
- RIA Checkpoint (Thomson)
- Science Direct (Elsevier)
- Small Business Reference Center (EBSCO)
- Socrates
- Standard Industrial Classification System (SIC)
- ThomasNet (Thomas Register)
- Value Line Investment Survey

SMS worked to gather and identify information related to food waste reduction systems in the following categories; however, it is important to note that some information was not available or was limited in amount and/or quality.

- Iowa Landfills
- Large Food Users
 - SMS researched food waste reduction systems currently in place within the following seven industries in the state of Iowa.
 - Colleges/Universities/Community Colleges
 - Grocery Chains/Discount Stores/Food Distributors
 - Hospitals
 - Hotels
 - K-12 School Districts
 - Restaurants
 - Retirements Communities

Primary Research

SMS worked in conjunction with IWRC team members to develop an appropriate recruitment script and survey, approximately 10 – 15 minutes in length, designed to collect information that supported the overall project objective. Topics included:

- Where does food waste go?
 - [Landfill] Buried, composted.
 - [Large food users] Waste stream, composted.
- Why does it go there?
 - Current food waste system(s) in place.
 - Strengths and weaknesses of current program(s).
 - Food waste management system satisfaction.
 - Barriers to implementing other measures.
 - Rules, regulations, permits.
- Potential alternatives to current method(s).
- Level of awareness/concern surrounding food waste.

SMS populated a list of Iowa large food users in-house by randomly selecting businesses within the seven industries listed above. SMS made an effort to include businesses of varying sizes and geographic locations when populating the list. A complete list of Iowa landfills was provided to SMS by the IWRC.

During recruitment, each potential survey respondent was contacted a maximum of five times before being labeled as unresponsive. In the event that the provided participant was available, SMS confirmed that the identified person was the appropriate respondent to speak with about the research topic, and/or identified any assistants who were just as qualified to help with the research. Once a contact was confirmed as the only/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 asked 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.

Completion Rates

Landfills



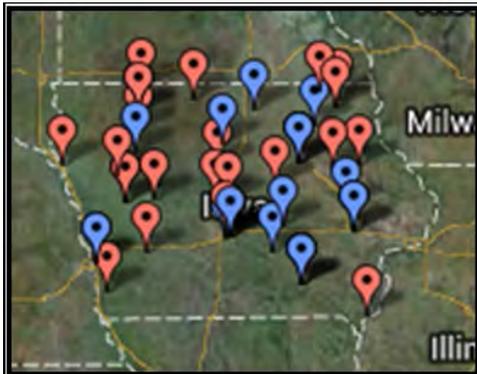
SMS received 37 usable surveys at the time this report was written for a response rate of 90.2%. The geographic location of the respondents is mapped to the left. The **blue** pins represent the respondents who *had* a food waste management system; the **red** pins represent the respondents who *did not have* a food waste management system.

There are 43 permitted municipal landfills in Iowa. During research administration, SMS found two instances where multiple landfills were managed by the same organization. The landfills in question are listed below.

- Metro Park West Landfill & Metro Park East Landfill are managed by Metro Waste Authority.
- Loess Hills Landfill and Montgomery County landfill are managed by Iowa Waste Systems.

Since these landfills are managed by the same organization, their food waste management system (or lack thereof) was the same; therefore, only one survey was completed for each management organization.

Large Food Users



SMS began with a list of 63 large food users and received 45 usable surveys at the time this report was written, for a response rate of 71.4%. The geographic location of the respondents is mapped to the left. The **blue** pins represent the respondents who *had* a food waste management system; the **red** pins represent the respondents who *did not have* a food waste management system.

Executive Summary

Secondary Research

Landfills

SMS found three common themes when researching food waste management systems in Iowa landfills: educational programs, composting, and electricity generation using methane gas. The bullets below outline each food waste management system type and the frequency with which it appeared.

- Educational programs (as they relate to food waste reduction) (7)
 - Typically, educational programs focused on backyard composting and vermicomposting.
- Composting (6)
 - Three landfills composted food waste at summer festivals, and two landfills only composted commercial food waste.
- Electricity generation using methane gas (6)
 - Six landfills converted their methane gas into energy.
- Other (3)
 - Curbside food scrap recycling program/Curbside yard and garden waste program. (2)
 - Home trash survey program.

Large Food Users

Iowa's large food users' food waste management systems were more diverse; however, about five systems rose to the top: composting, trayless dining, cooking oil recycling, donation, and source reduction.

- Composting (30)
 - Some large food users composted their own food waste, and others partnered with a third party vendor.
- Trayless dining (17)
- Recycles cooking oil (15)
- Donation (10)
- Source reduction (10)
 - Typically, large food users reduced their food waste by using a food management program. Other methods of source reduction mentioned were properly filtering fryer oil to extend the oil life, and weighing and recording information pertaining to food waste, then discarding it in clear buckets to allow for a visual inspection of the amount and types of food.
- Uses pulper to mash food waste (4)
- Vermicomposting (2)
- Other (4)
 - Anaerobic digestion
 - Diversion
 - Food, purchasing, and waste task group
 - Zero waste picnic

Primary Research

Landfills

Approximately one-fourth of the respondent group (nine respondents) captured their methane gas; however, only three respondents used their methane gas to generate electricity.

Landfills who *had* a food waste management system (N=6)

Only six landfills in Iowa had a food waste management system. The most commonly reported food waste management techniques were methane capturing (six respondents), composting (five respondents), and educational programs (three respondents). Two-thirds of the respondent group (four respondents) reported they implemented a food waste management system because it was good for the environment. The average length of time that food waste systems/techniques had been in place was 8.11 years.

Respondents typically settled on the system they are currently using because it was the easiest (four respondents) and the most cost effective (three respondents). The cost effectiveness of the system was also reported as one of the major strengths (two respondents), along with ease of use (two respondents). Major weaknesses were reported to be climate issues (three respondents) and lack of resources (two respondents). Four out of the six respondents reported their system was a net cost to their organization, while the remaining two respondents reported their system was a net savings.

The two most commonly reported internal groups of people that helped respondents put together their food waste management system were landfill staff (four respondents) and landfill management (two respondents). The two most commonly reported external organizations that helped the respondent were private haulers (two respondents) and schools within the landfill's service area (two respondents). The only obstacle reported by more than one respondent was transportation, which was reported by two respondents.

Four respondents had to follow rules/regulations when implementing their system; three out of those four had to get their permit modified. The governing body of the rules/regulations was the DNR for two respondents and the City for the other two respondents.

The majority of the respondent group (four respondents) reported they didn't consider any other food waste management techniques when implementing their system; however, all six respondents reported they may consider implementing additional techniques in the future.

Respondents were highly satisfied with their food waste management system. All six respondents reported they would recommend their system to their peers, and would do it all over again in order to reduce food waste.

Landfills who *did not have* a food waste management system (N=31)

In general, respondents who did not have a food waste management system did not feel that food waste was a significant problem for their landfill. With that being said, twenty-three respondents were very or somewhat familiar with food waste management systems or techniques, largely due to the length of time they'd been in the business and/or conferences/classes they've attended. Most of the respondent group (22 respondents) was familiar with composting.

Respondents who were familiar with food waste management systems (N=23) reported they liked them because they can yield a useful product and are good for the environment (each category was reported

by five respondents). An additional five respondents did not like anything about food waste management systems. The most common dislikes were the cost (nine respondents), issues associated with composting (five respondents), and the lack of resources to implement a system (five respondents). The biggest obstacles that a landfill would have to overcome in order to implement a system was the cost (13 respondents), collection/transportation issues (seven respondents), community/leadership buy-in (six respondents), and space/location (six respondents). The majority of the respondent group (19 respondents) did not have future plans to implement a system.

Large Food Users

Large food users who *had* a food waste management system (N=21)

Twenty-one respondents had a food waste management system. The most commonly reported food waste management techniques were composting (11 respondents), donation (eight respondents), and source reduction (eight respondents). Slightly over half of the respondent group (12 respondents) reported they implemented a food waste management system to reduce food waste, and nine respondents reported they implemented a system to cut costs. The average length of time that food waste systems/techniques had been in place was 5.26 years.

Respondents typically settled on the system they are currently using because it was easiest (nine respondents). The reduction in food waste (12 respondents) was the most common system strength reported by respondents, while the most common weakness was the additional work for staff (seven respondents). Two-thirds of the respondent group (14 respondents) reported that their system was a net savings to their organization, and eight respondents reported the savings was seen in decreased disposal costs.

The food service director and/or food service staff (14 respondents) was the most commonly reported internal group that helped respondents put together their food waste management system, and the most commonly reported external organization was an off-site composting vendor (five respondents). In addition, nine respondents reported that no outside organizations helped put together their food waste management system. The additional time for internal staff (six respondents) was the most frequently reported obstacle that respondents had to overcome when implementing their system; however, four respondents reported they didn't have to overcome any obstacles. The majority of the respondent group (15 respondents) did not have to follow rules/regulations when implementing their system.

When implementing their current system, twelve respondents hadn't considered any other food waste management techniques. When looking into the future, nine respondents were considering implementing additional techniques. The most common technique reported by respondents was composting.

Respondents were highly satisfied with their food waste management system. All 21 respondents reported they would recommend their system to their peers, and would do it all over again in order to reduce food waste.

Large food users who *did not have* a food waste management system (N=24)

In general, respondents who did not have a food waste management system did not feel that food waste was a significant problem for their organization, and only five respondents were very or somewhat familiar with food management systems or techniques.

Respondents who were familiar with food waste management systems (N=5) reported they liked them because they are good for the environment (two respondents) and could yield a useful product (two respondents). Another respondent commented that it was a good thing to do to give back to the community. Two respondents did not dislike anything in particular about food waste systems; other dislikes reported by respondents were widespread with no common theme. The biggest obstacle that large food users would have to overcome in order to implement a system was the quantity of food waste. Two respondents didn't feel like a system would be beneficial to their organization because they didn't produce enough food waste. The majority of the respondent group (four respondents) did not have future plans to implement a system.

Conclusion

The respondent group was divided into those who had a system and liked it, and those who didn't have a system and didn't think that it was a problem. There were very few respondents in-between. Respondents who had a food waste management system, regardless if they were a landfill or large food user, were highly satisfied with their system and would recommend it to their peers; however, respondents who did not have a food waste management system didn't feel that food waste was a significant problem for their organization, and weren't likely to implement a system in the future.

The cost effectiveness and ease of use were the biggest reasons why landfills and large food users implemented their current system. While it was recognized that reducing food waste is good for the environment, respondents also asked, "what's in it for me?"

The data shows that there is a need for a food reduction program for both large food users and landfills in Iowa. The Iowa Waste Reduction Center should pay special attention to the following when developing a program:

- Educating the public about the environmental hazards of food waste. Many respondents didn't feel that it was a problem, and one respondent even commented that he didn't think that food waste reduction even reduced our carbon footprint.
- "What's in it for me?" Educating the public about how food waste reduction directly benefits them or their organization should make them more willing to try something new.

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Secondary Research Results

Landfills

Black Hawk County Sanitary Landfill / Black Hawk County Solid Waste Management Commission (Waterloo)

Food Waste System Snapshot:

- Educational programs

Educational programs²

The Black Hawk County Solid Waste Management Commission provides many services and programs besides landfilling. These include on-site yard waste composting, providing free compost to residents, asbestos disposal, appliance recycling, tire recycling, a toxic clean-up day for household hazardous materials, an educational web-site (www.WasteTrac.org) and free education programs provided by the Waste Trac educators. In addition, the solid waste commission helps fund local recycling by giving grants to area communities.

Butler County Solid Waste Commission / Bluestem Solid Waste Agency (Cedar Rapids) / Clinton County Area Solid Waste Authority

Food Waste System Snapshot:

- Compost food waste at summer festivals

Recovering compostables at Iowa festivals³

January 2001 – Summer festivals offer food, entertainment, cultural enrichment and learning to Iowa residents. They also bring an increase in landfilled material due to the convenience of single use products and the diverse assortment of specialty food items. Last year, three Iowa agencies - the Butler County Solid Waste Commission (BCSWC), Bluestem Solid Waste Agency in Cedar Rapids and the Clinton County Area Solid Waste Authority (CCASWA) - took advantage of special events and launched waste reduction and diversion initiatives in each of their respective service areas.

Working in conjunction with the Butler County Agricultural and Horticultural Society (BLAHS), the BCSWC initiated a pilot project to compost food residuals, animal waste and compostable paper products produced on-site during the 144th annual Butler County Fair, held July 5-9. The goal was to

² Waste Trac: <http://www.wastetrac.org/aboutus.html>

³ BioCycle: <http://search.proquest.com/docview/236898527/13EC7D1D039451500D1/4?accountid=14691>

gather baseline data to pursue partnerships with other celebrations throughout the county and to establish an annual diversion program with the BLAHS. The project was funded internally, with the exception of a donation from Waste Management, Inc.

BCSWC contracted Creative Composting Concepts in Robins, Iowa to oversee the project at a cost of \$800, including rental of a mobile BW Organics in-vessel rotary digester. BCSWC received a permit waiver from the Iowa Department of Natural Resources (IDNR) for temporary use of the four-by-eight-foot drum as an educational exhibit. The vessel was loaded with 270 lbs of liquid hog manure and 130 lbs of corn stalks, then delivered to the fairgrounds two days prior to the event. The material was received at a temperature of 140 deg F. During the five-day fair, 600 lbs of compostables were loaded into the digester, filling the drum to its 1,000 lb capacity.

The drum was placed between two livestock barns so that their odors would mask any generated by the festival materials. The area also provided electrical outlets to power the chain-driven digester, which rotated at a rate of four revolutions per hour. Source separated materials were collected daily by Creative Composting Concepts and BCSWC members. Compostables were taken to the drum in a wheelbarrow; plastic bottles were returned to the distributor.

Paper was put through an office shredder and mixed with water and animal waste before being placed in the drum. Moisture was kept at 5%. Food residuals generated by the 12,600 attendees represented less than one percent of the 600 lbs of festival compostables (paper products made up the rest). Temperatures began to drop below 90 deg F due to lack of nitrogen. Animal waste from the livestock barns and corn stalks from home economics exhibits were collected and integrated into the drum, bringing temperatures back up to the desired 110 deg to 140 deg F. The initial material and fair residuals were processed throughout the duration of the five-day event, plus an additional three days, before the compost was transported to Organic Matters in Robins, Iowa for 30 days of curing. Overall, there was a 75% reduction in organic materials. The compost was then further processed by vermicomposting. It will be combined with other finished material and marketed under the name Heavenly Humus.

Livestock was bedded heavily with wood chips to make cleanup easy for participating 4-H members. In addition to the portion processed in the in-vessel drum, approximately 36 tons of animal waste and bedding were picked up from the fairgrounds by a local composting facility, Westendorf Poultry Farms in Allison, Iowa. BCSWC also collected five cubic yards of OCC from behind vendor stands, and took them to the Butler County Transfer Station for processing.

Good Clean Fun

On June 16, IDNR issued a permit amendment to Bluestem allowing it to compost source separated food residuals from special events. Bluestem is investigating possible food residuals diversion programs with local grocers, but in the meantime initiated the Good Clean Fun Project, a three year partnership with Freedom Festival and Taste of Iowa - Rockin' on the River. Several Good Clean Fun events took place between June 22 and September 4, attracting 300,000 people. The Freedom Festival received a three-year, \$19,935 IDNR grant, while Bluestem provided matching funds and technical assistance.

Collected compostables totaled 5,480 lbs. In addition, 3,859 lbs of OCC from vendor stands were hauled to City Carton Company in Cedar Rapids for processing and 3,757 lbs of plastic beverage bottles were returned to the distributor. The goal of diverting 60% of landfilled material was surpassed by 3%.

Compostables from the summer events were collected in roll-off containers and taken to Bluestem's 17-acre facility. The organics were weighed and added to existing trapezoidal windrows. The materials were turned weekly and monitored for aeration as well as moisture, which was targeted at a constant 60%. After active processing, the compost was placed in piles to cure for six to 12 months.

Finished compost will be put through a three-eighths-inch screen and placed in 40 lb LDPE bags under one of Bluestem's brand names: Big Blue Top Soil, Big Blue Humus, Big Blue Compost or Big Blue Potting Soil. The composting facility is the largest in Iowa, processing 100,000 tons/year. Bluestem believes that special event partnerships will bring volume up to 120,000 tons in 2001.

In-Vessel Digester

CCASWA has an MSW in-vessel digester permit issued by IDNR in January, 1997. Since operation began in April, 2000, the digester has achieved 33% volume reduction. The primary goal is to increase the life of the landfill. CCASWA's education director, Laura Liegois, is confident that special event partnerships will make progress toward this.

The authority initiated a project to recover organics and plastic bottles at the 67th annual Clinton County Fair, held July 30-August 2 2001. Expenses were shared between CCASWA and the Clinton County Agricultural Society 4-H and Future Farmers of America (FFA). A total of 4,560 lbs were collected at the event, which hosted 10,000 visitors.

Plastic beverage containers were gathered by fair personnel and returned to the distributor. Organics were collected in roll-off containers and hauled to CCASWA in rural Clinton, Iowa. After being weighed, they were unloaded on the tipping floor and integrated into the 50 tons of MSW received daily at the facility. Materials were processed through a 170-foot rotating drum. After five days, finished fines were screened through an 11-foot-diameter rotating double screen at the end of the drum. Stabilized rejects were landfilled and screened fines were used as alternative daily cover. (See article, "Processing MSW For Daily Cover," in this issue.)

In addition, a local farmer collected and windrowed 47 tons of straw and animal waste from the cattle barns. Nine tons of mixed wood shavings and straw were land applied from the hog barns.

Similar Planning

Although some of the means and goals of BCSWC, Bluestem and CCASWA differ, similarities exist in preparation and special event planning. All recycling initiatives were heavily publicized through several outlets, including press releases, flyers, and radio and television interviews. BCSWC and CCASWA both sponsored an exhibit booth at their fairs to educate the public on recycling and composting. Event volunteers aided all three agencies. Because of the multiple waste streams being collected by BCSWC and Bluestem, their volunteers, labeled "The Green Dream Team" and "Garbage Gurus," respectively, manned collection stations and educated the public about using the appropriate containers and aided in sorting the different waste streams. Both sets of volunteers were given T-shirts for their efforts. (CCASWA's waste streams were self-explanatory, on the other hand, and volunteers consisted primarily of 4-H members working in the vendor stand.) All agencies held training sessions to educate volunteers about organics recycling and outline project goals.

The three agencies strategically placed high-profile collection stations by vendor stands to collect organics and recyclables. BCSWC's 50-gallon metal drums were recycled paint barrels donated by Butler County's Secondary Road Department, with environmental murals painted on them by area students. The Good Clean Fun Project used 32-gallon containers purchased by Freedom Festival, Inc. through the IDNR grant and Bluestem funding. These containers were lent to Taste of Iowa - Rockin' on the River for the duration of the weekend event. The CCASWA used 50-gallon plastic containers recycled from an area manufacturing company. All three agencies relied heavily on signs posted at collection points and around the surrounding event area.

Communication between event organizers and vendors was a necessity in organization. CCASWA had one vendor on site, a food stand operated by the Clinton County Agricultural Society 4-H and FFA, which

purchased biodegradable food service products for use during the fair. Carnival vendors primarily used compostable paper products. BCSWC had a total of four on-site vendors. Three purchased compostable paper products as opposed to the noncompostables used in prior years. The IDNR grant and Bluestem matching funds were used to purchase compostable products for the 36 participating vendors in The Good Clean Fun Project. BCSWC and Bluestem used compostable trash bags donated by IDNR.

All three agencies anticipate continuation of special events projects. Data obtained in the 2000 pilot year will allow them to fine-tune their processes and share lessons of success and operational difficulties with other agencies that anticipate participation in special events projects within their own areas.

Cedar Rapids / Linn County Solid Waste Agency #2 Sanitary Landfill (Marion)

Food Waste System Snapshot:

- Compost commercial food waste
- Uses captured methane to generate energy

Commercial Food Waste Recycling⁴

Their compost facility is able to accept food waste from retailers and institutions but there are conditions. Currently, they are processing produce from grocers and cafeteria waste from local institutions. These customers landfill less and benefit from a reduced tipping fee: \$18/ton for compostable material compared to \$38/ton for garbage.

The Agency has been making compost since its founding in 1994. Their facility is regarded as among the best in its class. Their compost has been sampled and tested as required by the Seal of Testing Assurance program of the U.S. Composting Council.

Residents and businesses can pick up compost from the Solid Waste Agency's Cedar Rapids site.

- At each visit, Linn County residents may pick up one ton (2000 pounds) free of charge with their personal vehicle.
- The pricing for businesses is \$15 per ton.

Linn County landfill generator will produce electricity to support about 1,000 homes⁵

August 21, 2012 — The Cedar Rapids/Linn County Solid Waste Agency is at it again, preparing to turn methane generated by decaying landfill trash into electricity and heat.

The latest agency effort is taking place at its Site 2 landfill, at County Home Road and Highway 13 north of Marion, where the agency currently has a well and pipe system to capture methane that it burns off into the air with a flare system.

⁴ Solid Waste Agency: <http://www.solidwasteagency.org>

⁵ The Gazette: <http://thegazette.com/2012/08/21/agency-to-turn-methane-gas-from-landfill-into-electricity-and-heat/>

By January, the agency plans to use the methane to drive a generator to produce electricity and feed it into the rural electrical grid.

Brian Harthun, the agency's consulting engineer, on Tuesday said the agency hopes to recoup from the sale of electricity the \$3 million in upfront capital costs for the new waste gas-to-energy system. It should take about 10 years, he said. After that, the production of electricity will become a revenue source for that agency, he added.

The agency's generator will produce about 1,600 kilowatts of electricity an hour, an amount sufficient to provide electricity to about 1,000 homes, Harthun estimated.

The setup, he added, will allow the agency to capture heat from the generator, which will be used to heat the Solid Waste Agency's new Resource Recovery Center building, now under construction. The heat will save the agency an estimated \$90,000 a year in propane heating costs, Harthun said.

Karmin McShane, the agency's director, on Tuesday said the energy production from methane is a bonus for a methane collection system designed first to manage the landfill's methane gas and to cut down on its odor. The system at Site 2 now features 22 vertical wells and seven horizontal wells that feed methane to a central collection point, Harthun said.

The agency's history with converting landfill methane into a resource reaches back to 1984, when the agency built a collection system at its Site 1 landfill near Czech Village to pipe methane to Alliant Energy's nearby coal-fired power plant, McShane noted on Tuesday.

The system was damaged in the flood of 2008, and since 2009, the Solid Waste Agency and the contractor that managed the system have been mired in a lawsuit. The legal matter is slated for arbitration in October, McShane said.

For now, she said the methane collected at Site 1 is burned off with a flare with no end user for the gas connected to the system.

Flaring the gas is better from a greenhouse-gas standpoint than allowing methane gas to seep into the air, agency spokesman Joe Horaney added on Tuesday.

Central Disposal Landfill (Lake Mills)

Food Waste System Snapshot:

- Uses captured methane to generate energy

Central Disposal Landfill Generating Station⁶

The 4.8 MW Central Disposal Landfill gas-to-energy (LGE) generating facility can power 4,000 homes. Dairyland Power Cooperative purchases the renewable energy from the owner of the landfill, Waste Management, Inc.

The natural byproduct of the residential waste landfills, methane gas, is the fuel used to generate the renewable energy.

⁶ Dairyland Power Cooperative: <http://www.dairyland.com/>

City of Iowa City Sanitary Landfill (Iowa City)

Food Waste System Snapshot:

- Composts commercial food waste
- Educational programs about composting and vermicomposting
- Uses captured methane to generate energy

Commercial Organics Composting⁷

In an effort to reduce waste and produce quality compost for the community, the Landfill has a commercial composting facility for yard waste and other organics. The tip fee for commercial organics is \$24 per ton, which is less than the cost of landfilling the material.

The materials must be 100% organic; no contamination is allowed or the load is treated and charged as trash. Materials must arrive unbagged, in paper bags or in pre-approved biodegradable, compostable bags that meet ASTM D6400 certification.

What is acceptable?

Yard waste, including:

- Grass.
- Garden waste, including fallen apples, pumpkins, etc.
- Leaves.
- Branches.

All food waste, including:

- Fruits and vegetables.
- Meat (raw or cooked, including bones).
- Seafood (raw or cooked, including shells).
- Grains, bread and baked goods.
- Dairy, eggs, coffee grounds/filters.
- Mixed plate scrapings.
- Wood produce crates.
- Floral waste.
- Leftovers past the point of re-serving.
- Spoiled foods.
- Paper that has been in contact with food:
 - Napkins.
 - Parchment bakery tray liners.
 - Pizza boxes.
 - Uncoated paper plates.

⁷ City of Iowa City, Iowa: <http://www.icgov.org/?id=1611>

NOT acceptable:

- Any trash or other contaminants.
- Plastic, metal, glass.
- Foil- or plastic-coated paper.
- Plastic packaging.
- Plastic straw wrappers, stir sticks.
- Styrofoam.
- Waxed paper or waxed cardboard (most often it's actually plastic-coated).
- Chemically treated or painted wood.

How does commercial composting work?

Commercial composting at the Iowa City Landfill is as simple as it gets—materials are composted in open-air windrows just like they would be in back yard bins, but much larger! The Iowa City Landfill takes in about 10,000 to 12,000 tons of organics each year—yard waste, leaves and some food waste. From that, between 4,500 and 6,000 tons of finished compost is produced and sold each year.

Incoming materials are ground up, piled in long open-air windrows and turned monthly to encourage microbial and bacterial breakdown of the organic matter. The temperatures are taken in each windrow twice per week to ensure that the temperatures reach a minimum of 132 degrees Fahrenheit for at least two weeks, the minimum temperature and time needed to kill any harmful bacteria and weed seeds. Once the compost is done “cooking,” it is screened and must cure for 30 days. Overall, it takes about six to eight months to make compost at the landfill. At that point the landfill sells it for \$10 per ton.

Disposal Alternatives⁸

The Iowa City Landfill and Recycling Center provides a brochure titled *Composting at Home*, which is a resource for residents who wish to build and maintain their own compost pile.

They also talk about vermicomposting at home in the *Johnson County Waste Reduction and Recycling Guide*. The guide talks about how to start vermicomposting, what to feed the worms, and where you can get red worms locally.

University of Iowa, Iowa City landfill partners on methane gas project⁹

February 28, 2011 – Gas from the Iowa City Landfill will be used to help the University of Iowa power its research campus, an environmentally friendly project that also will boost the city's coffers.

The city will pump methane, a gas created as garbage decays, through a pipeline to the UI Research Park, previously known as Oakdale Research Park. The UI, which will pay the city for the gas, will use it to supply electricity and heat to the campus.

The goal is to have the system operational one year from now.

The benefits of the project are many, local officials and national experts said. The city gets money for something it would otherwise burn off, the money spent by the UI stays local and the landfill gas offsets usage of fossil fuels, like natural gas.

⁸ City of Iowa City, Iowa: <http://www.icgov.org/?id=1611>

⁹ The Gazette: <http://thegazette.com/2011/02/28/ui-i-c-landfill-partners-on-methane-gas-project/>

“The more creative we can be with approaching (sustainability) from a revenue-stream perspective, as well as from an environmental perspective, I think we’ll continue to be out there on that cutting edge,” Iowa City Council member Regenia Bailey said.

The Iowa City-UI project is especially efficient as landfill-gas projects go, because the methane will be used to generate electricity and heat — a process known as cogeneration — as opposed to just one kind of energy.

“That is absolutely the most efficient way to use it ... so I actually applaud them for doing that,” said Jeremy O’Brien, the director of applied research for the Solid Waste Association of North America.

There were 541 landfill-gas energy projects nationwide at the end of last year, up 87% from 2000, according to the U.S. Environmental Protection Agency.

The projects foster community partnerships, reduce odor and reduce greenhouse gas emissions, said Swarupa Ganguli, a program manager for the EPA’s Landfill Methane Outreach Program.

Methane is 21 times more potent than carbon dioxide as a greenhouse gas, although Iowa City’s current practice of flaring the landfill gas resolves most of the pollution concern.

Four of the projects are in Iowa. That’s counting one involving the Cedar Rapids/Linn County Solid Waste Agency that is on hold because of a legal dispute between the agency and the company that owns the system that retrieves the methane.

The Iowa City-UI project will collect methane from the city’s 180-acre landfill west of town and pump it through a 6-mile-long underground pipeline to the Research Park, north of Coralville.

The UI has invested \$25 million in a new energy system for the growing research campus, said Ferman Milster, the UI’s associate director of utilities and energy management. That includes new electrical and mechanical distribution systems and a new central chilled-water plant.

It has two reciprocating engines that can burn either natural gas or landfill gas. The UI is planning on more than 90% of the electrical power at the research campus to be generated with landfill gas, as well as some of the heat, Milster said.

The UI also is installing a biomass boiler that will burn wood chips. The goal is to eventually have the Research Park run 100% on renewable fuel, Milster said.

Currently, the primary sources are natural gas and buying power off the electrical grid. The coal, natural gas and oil resources that serve as fuel come from out of state, Milster said.

“We’ll be buying our biomass local. We’ll be buying the landfill gas local. It will be a source of revenue for the city,” he said.

The UI’s main campus in Iowa City spends \$27 million a year on fuel and electrical power, with the Research Park spending another \$2.5 million, he said.

Milster said the UI may not see a significant decrease in its utility bills, but it doesn’t expect to spend more.

Any cost savings are secondary, said Paul Chamberlin, the University of New Hampshire’s assistant vice president for energy and campus development. About 60% of the school’s energy comes from landfill gas, with a goal of getting to 85%.

“The reason you do one of these projects is really about securing your energy sources for the future and reducing your reliance on fossil fuels, reducing your greenhouse-gas footprint,” Chamberlin said.

Details are still being finalized on what Iowa City will be paid for its gas.

The city expects to spend \$2 million for the gas conditioning and compression equipment at the landfill, said Rick Fosse, public works director. It's not yet known if the city, the UI or a third party will own and operate that equipment.

The UI spent about \$500,000 to equip the new reciprocating engines with the ability to burn landfill gas, Milster said.

MidAmerican Energy will build, own and operate the pipeline.

The city plans to send to the UI all the methane the landfill produces, which amounts to 1,200 cubic feet per minute, Fosse said. That gas would otherwise be flared at no monetary benefit to the city.

"It turns a liability into an asset," Fosse said.

Clinton County Sanitary Landfill (Clinton)

Food Waste System Snapshot:

- Compost using a Bioreactor
- Educational programs about composting

Landfill Composting¹⁰

In 2000, Clinton County Area Solid Waste Agency introduced the Bioreactor. The Bioreactor is an in-vessel municipal solid waste composting facility. Garbage from municipalities in Clinton County is placed in the rotating kiln with water. As the kiln rotates the waste heats up on its own. All of the organic materials such as paper and food waste will turn into compost. All of the composted material is used on the landfill for daily cover.

Backyard Composting¹¹

Residents are encouraged to compost in their backyards. CCASWA sponsors composting workshops several times a year. Along with backyard composting, vermicomposting is offered with the Clinton County Conservation Board. Composting helps with yard waste disposal by creating a good product out of waste that cannot be landfilled.

¹⁰ Clinton County Area Solid Waste Agency: <http://www.ccaswa.com>

¹¹ Clinton County Area Solid Waste Agency: <http://www.ccaswa.com>

Dubuque Metropolitan Sanitary Landfill (Dubuque)

Food Waste System Snapshot:

- Curbside food scrap recycling program/composting
- Educational programs about backyard composting and vermicomposting
- Uses captured methane to generate energy

Vermicomposting¹²

The Dubuque Metropolitan Area Solid Waste Commission’s Education Office provides information about vermicomposting as a way to reduce food waste.

Backyard composting¹³

The Dubuque Metropolitan Area Solid Waste Commission’s Education Office provides information about backyard composting. The information focuses mostly on yard waste; however, it does mention vegetable peels.

City of Dubuque Food Scrap Recycling¹⁴

Dubuque was the first city in Iowa to offer a curbside food scrap recycling program. The food scrap recycling program has helped their community:

- Extend their landfill's life.
- Reduce pollution (especially methane - a powerful greenhouse gas).
- Maintain Dubuque county’s recycling rate above 25%.
- Create a beneficial compost product for gardens, landscaping, erosion control, and watershed protection.

The Yard Debris/Organics Value-Added Collection Option for Food Scraps

City customers may now also put their food scraps and compostable paper in their yard debris carts, cans, and bags. Their current yard debris containers would either be subscribed 64-gallon carts, 35-gallon cans with annual yard debris decals, 35-gallon cans with attached yellow stickers, or paper yard waste bags with attached yellow stickers.

The City’s new composting contractor, Full Circle Organics LLC, has approved the use of bio-plastic “compostable” bags marked as meeting ASTM standards 6400 or 6868. These bags can be used to contain food scraps in kitchen containers before later depositing them in the customers’ carts, cans, or bags, and other sizes used in lining larger commercial customer containers.

The GreenCart and Source Separated Organics Program Option (April – November)

Currently up to 250 households, businesses, and institutions subscribe to this fee-based program. Residential subscribers are provided a 1.5-gallon Kitchen Catcher container and a 13-gallon wheeled,

¹² Dubuque Metropolitan Sanitary Landfill: <http://www.dmaswa.org>

¹³ Dubuque Metropolitan Sanitary Landfill: <http://www.dmaswa.org>

¹⁴ City of Dubuque: www.cityofdubuque.org

GreenCart. The subscription fee for each GreenCart is only \$0.60 per month and is added to their City utility bill. Larger cart options are available to business and institutional customers: 48 gallon carts at \$5.50 per month and 64 gallon carts at \$8.50 per month.

Dubuque metro landfill looks to turn methane into money¹⁵

November 28, 2012 – Dubuque is looking to turn 2.2 million tons of trash into something that will save both money and the environment.

At the Dubuque Metropolitan Area Solid Waste Agency (DMASWA) landfill, eight "cells" hold some 2.2 million tons of trash. The garbage has accumulated from Dubuque and Delaware counties since the mid-70s.

Decomposing trash naturally releases greenhouse gases, which seep up through the ground if not tapped and enter the air, to the detriment of the environment.

"The agency was aware that there's quite a bit of fugitive methane leaking from the landfill -- as it does from all landfills -- and contributing to greenhouse gas effects and problems," Dubuque public works director Don Vogt said.

That's why in 2009, the DMASWA started building a system to collect the gas and then burn it off, which is better for the environment. That started up in 2010.

"What we're doing is we're just flaring it up in the air and making it safe right now," DMASWA administrator Chuck Goddard said.

50 to 60% of this gas is methane, which agency officials hope to soon convert into electricity and sell.

"Not only would there be the revenue stream from selling the electricity, but the heat that would come off of the two generators would be used to heat the buildings out there, so it would dramatically reduce our heating costs," Vogt said.

"We're only going to be the second one in the state of Iowa that's actually going to make electricity from our gas, so we are being kind of leaders in the state of Iowa," Goddard said, adding that Cedar Rapids is the first and Iowa City looks to be a close third.

The methane-to-electricity conversion would require an estimated \$3.5 million to \$4 million electrical generating station. Goddard said this could take more than a decade to pay off, but Vogt said taxpayers won't be on the hook, since funding would likely come from Iowa Energy Bank low-interest loans.

Goddard said he anticipates the project will create about 12 million kWh of energy per year, which could power some 1,000 average American homes annually. Vogt said he foresees a solid 50-year supply of the gas.

The DMASWA is in negotiations right now to sell the electricity it would generate to Central Iowa Power Cooperative (CIPCO), which provides power to the Maquoketa Valley Electric Cooperative (MVEC).

Vogt said the DMASWA hopes to have a contract signed in January, with electrical generation up and running by the end of summer 2013.

"Right now, things are looking up for this project," he said, though cautiously, since a similar deal with Alliant Energy fell through in December of last year.

¹⁵ KWWL: <http://www.kwwl.com/story/20211480/2012/11/28/dubuque-metro-landfill-looks-to-turn-methane-into-money>

Vogt also added the landfill does not, nor never has, run on taxpayer dollars. He said it operates purely on user fees and -- when necessary, such as in this case -- outside funding such as low-interest loans.

Fayette County Sanitary Landfill (Fayette)

Food Waste System Snapshot:

- Educational programs about backyard composting and vermicomposting
- Home trash survey program

Recycling Programs Available¹⁶

Programs related to food waste reduction include:

- Bucket Composting.
- Composting.
- Home Trash Survey Program.
- Worm Column Composting.
- Worm Composting.

Metro Waste Authority – Metro Park West Landfill (Perry) & Metro Park East Landfill (Mitchellville)

Food Waste System Snapshot:

- Curbside yard and garden waste program/composting
- Uses captured methane to generate energy

Compost It!¹⁷

Compost It! is the yard and garden waste curbside program for most residents in Central Iowa and is managed by Metro Waste Authority. In most communities, it is picked up from the curb weekly during Compost It! Season, on garbage collection day. The Compost It! program only accepts yard waste and vegetative debris that breaks down into compost.

The Metro Compost Center recycles more than 20,000 tons of yard waste into a nutrient rich compost that undergoes regular testing to meet the U.S. Composting Council's Seal of Assurance and approval for Organic Certification programs in Iowa. It is not open to the public – it is only open to contracted residential haulers and landscape companies; however, you can purchase the compost at retail locations throughout the metro area.

¹⁶ Fayette County Solid Waste Management Commission: <http://www.fayettecountyiowa.org/RECYCLING.html>

¹⁷ Metro Waste Authority: <http://www.mwatoday.com/>

Capturing Landfill Gas¹⁸

In 1993, Metro Waste Authority formed a partnership with MidAmerican Energy and Waste Management to provide a safe and smart solution to an environmental problem – landfill gas emissions.

- Metro Waste Authority captures the landfill gas creating by the garbage slowly breaks down.
- Waste Management oversees the plant which converts the gas to electricity.
- MidAmerican Energy's power grid takes this electricity and powers area homes and businesses.

Ottumwa-Wapello County Sanitary Landfill (Ottumwa)

Food Waste System Snapshot:

- Educational program about backyard composting

Backyard Composting¹⁹

The following information was posted on the website:

Organic materials like grass clippings, leaves and food scraps can be composted at home. Composting household and yard wastes is a green alternative to conventional disposal methods. The benefit to the homeowner is the creation of free soil additive for landscaping and gardening. More than 25% of the typical household's waste is yard trimmings and food scraps that can be composted. Active composting reduces the amount of waste being thrown away, saving space at the landfill and providing a useful alternative to burning.

Composting transforms organic material into material that can improve the soil used in gardens, lawns, and houseplants. Compost fuels plant growth and restores vitality to depleted soil. It is also free and easy to make. Composting recycles kitchen waste; it can divert as much as 30% of household waste from the landfill. It introduces beneficial microscopic organisms into the soil that help aerate the soil, break down organic material for plant use, and fend off plant disease. Compost is good for the environment, offering a free and environmentally healthy alternative to chemical fertilizers.

Scott Area Sanitary Landfill (Davenport)

Food Waste System Snapshot:

- Educational program about backyard composting
- Uses captured methane to generate energy

¹⁸ Metro Waste Authority: <http://www.mwatoday.com/>

¹⁹ City of Ottumwa: http://www.cityofottumwa.org/health/garbage_recycling/yard_waste

Backyard Composting²⁰

On their website, the Waste Commission of Scott County includes resources from other agencies, as well as links to more information about how to get started, what to compost, how to build a bin, troubleshooting, etc.

Capturing Landfill Gas²¹

Methane, the gas produced by the decomposition of garbage, is collected to prevent it from escaping into the atmosphere. The methane is then used by Linwood Mining to fire their limestone-drying kilns.

²⁰ Waste Commission of Scott County: <http://www.wastecom.com/Content/Residential/Composting-and-Yard-Waste.aspx>

²¹ Waste Commission of Scott County: Facts and Statistics on Scott Area Landfill (PDF)

Large Food Users

Colleges / Universities / Community Colleges

Briar Cliff University (Sioux City)

Food Waste System Snapshot:

- Trayless dining

'Trayless dining' may encourage mindful eating at Briar Cliff²²

February 02, 2009 – A dining service innovation at the Briar Cliff University cafe may be going beyond its initial goal of saving soap, water and energy.

Known as "trayless" Tuesdays and Thursdays, the effort may be helping some students stave off weight gain widely referred to as the "freshman 15" and the "senior 20."

One explanation for the extra pounds is obvious, says Dale Walker, a BCU administrator who works with the university's Aramark-provided food service. As freshmen, students leave the controlled menu of home and are free to indulge in a daily buffet of possibilities. Faced with this largesse, some students find it hard to limit their intake.

As seniors, pressure to move forward to job interviews and post-college employment can create significant stress. Some students look to food for comfort.

What does all this have to do with trayless dining at BCU?

"There's reason to believe that going trayless, even just two days a week, can encourage students to be more aware of how much they're actually eating," says Walker. "As they become more aware, they may begin making more informed choices about what they eat."

The trayless concept is simple. On Tuesdays and Thursdays, the Stark Student Center dining facility offers the usual buffet-style food service. But rather than placing entrees, side dishes, desserts and beverages all at once on a large tray, diners take only what they can hold in their hands.

"Of course, they can get up from the table and go back as many times as they want for more food; it's an all-you-can-eat buffet," says Walker. "But the trays are removed completely from sight. If they want more, they have to go back to take more."

Tuesdays and Thursdays were selected to go trayless because they tend to be slower days. And while some students perceive trayless as more inconvenient than conventional self-serve, it's precisely the hassle factor that can influence how much they eat.

"At first, it was an adjustment for students. Change can be difficult, but things have calmed down. There's more acceptance of it at this point," says Walker.

Studies have piled up evidence that people will go only so far for a second helping. The convenience factor is one of many areas of eating behavior research conducted by Dr. Brian Wansink, a Sioux City native and director of Cornell University's Food and Brand Lab.

²² Sioux City Journal: http://siouxcityjournal.com/special-section/local/article_dbdedd8e-a7e6-5706-889c-c0595f96cc09.html

"If people have to go to a separate lunch line to pay for candy and potato chips, they buy less. If the salad bar is farther away from the table, they will eat less salad," according to Wansink who reports these and other research findings in "Mindless Eating: Why We Eat More Than We Think" (Bantam; 2006).

Conversely, when food or drink is conveniently close, people tend to consume more. A mess-hall study showed that soldiers drank 81% more water when pitchers were placed on their table rather than on a side table. "They drank 42% more milk when the milk machine was 12 feet away than when it was 25 feet away," Wansink reports.

The trayless impact at Briar Cliff hasn't been subjected to scientific study. In its pilot phase, the approach is being observed and evaluated throughout the year. "How much is being saved in terms of food waste is probably the hardest thing to quantify. We do know that there will always be some component of food waste," says Walker.

But Briar Cliff officials are confident that trayless days are adding up to significant savings in water and the energy to heat that water for dishwashing. Likewise there's a reduction in the amount of detergent used for dishwashing and the amount of detergent released into the environment.

Administrators and staff expected to see such results when they launched the trayless concept at the beginning of fall term. Aramark had shared data that showed other institutions were saving on average 300 gallons of water a day after going trayless. Food waste was being cut by an average 200 pounds a day.

The potential for conserving water, detergent and energy, and reducing food waste supports Briar Cliff values on a number of levels, including respect for the environment. It's a simple, doable action that performed consistently can make a real difference, says Walker. "It's one way each person can get to a core Franciscan value and live it every day."

In the process, diners can grow ever mindful of their food choices; of whether or not they truly want that second entree or dessert.

"How many times do you put a dessert on your tray because you think you want it? Then by the time you finish everything else, you just don't want it anymore and that dessert ends up being thrown away," says Walker.

Some students will always prefer trays and that's understandable, says Walker. "But the benefits of trayless have become obvious and Briar Cliff is considering expanding it to even more days."

Buena Vista University (Storm Lake)

Food Waste System Snapshot:

- Trayless dining

Trayless Dining²³

May 24, 2011 – BVU’s campus food service, Sodexo Dining Services, will convert to trayless serving starting this fall. For the last two years, BVU and Sodexo have encouraged trayless dining. Statistics revealed that those efforts have had a positive impact, as the amount of waste per person has decreased by an average of 4.5 ounces per day, and the number of individuals dining without trays has increased to almost 70% for daily meals. In addition to the amount of food waste, trayless dining also has a positive effect on the environment. By eliminating the use of trays, this saves not only water used in washing each tray, but also saves electricity used in heating the water as well as electricity used in drying the trays.

Trayless dining is just one area where Buena Vista University is providing environmental stewardship. All new campus construction will be LEED certified. In addition, BVU is in the process of examining existing buildings on campus, such as the Estelle Siebens Science Center, to certify those buildings as LEED buildings with regard to maintenance and operation.

Central College (Pella)

Food Waste System Snapshot:

- Uses pulper to mash food waste
- Recycles cooking oil

Commercial-Grade Pulper²⁴

College students eat a lot. But, still, their eyes are often bigger than their stomachs. Fortunately, Central College has a system to prevent 1,500 pounds of wasted food from going into local landfills each week.

For 18 years, Central has been using a commercial-grade pulper to mash food waste and divert it from landfills. The machine is breaking down, and the college has received a \$20,000 grant from the Iowa Department of Natural Resources to replace it.

“We pitched it as a way to insure that Central continues our tradition of modeling sustainability for our students, as well as the greater community,” says Mike Lubberden, director of facilities planning and management.”

The 31,000-square-foot Central Market was built in 1995 and serves 2,000 meals a day, which totals more than 500,000 meals a year for students, faculty, staff and visitors. The commercial-grade pulper, which was purchased when the Market opened, has been repaired many times in the past year. The

²³ Buena Vista University: <http://www.bvu.edu/about/news/detail.dot?id=206570>

²⁴ Central College: <http://news.central.edu/2013/03/04/waste-not/>

Soild Waste Alternative Program (SWAP) grant from the DNR will cover the purchase of a new, state-of-the-art pulper to arrive in early summer.

“‘Going green’ is not a new venture for us but one that will continue the reputation and tradition that Central College has for being environmentally responsible stewards,” wrote Val Van Kooten, grant writer, in the proposal for the Central Waste Reduction Project.

The pulper is just one aspect of Central’s sustainability initiatives, which include energy-efficient vehicles, LEED-certified buildings, recycling, water conservation and renewable energy. All food thrown away by Central Market customers or left over in the food preparation process is fed into the pulper, which extracts and filters the processed water and recycles it as rinse water. The pulp is then funneled into biodegradable bags, which are removed to a composting facility in Eddyville, Iowa. Central saves 47 tons of post-consumer food waste per year from area landfills by using the pulper.

Within a few years, Central hopes to purchase two dehydrators, which will turn the pulp into a fluffy, sawdust-like material that can be spread as fertilizer on campus athletic fields, gardens and flower beds. These dehydrators could not be purchased without first replacing the pulper.

The commercial-grade pulper requires much less water than a traditional garbage disposal system. Central estimates that it saves an estimated 2.2 to 3.2 million gallons of water per year by using the pulper. According to the City of Pella Water Department, this is equal to more than \$12,000 in savings in water bills and wastewater treatment fees per year.

Mark Howard, director of dining services, explains that Central Market puts enormous effort into being as efficient and sustainable as possible. Last year, in partnership with a marketing class, Central Market instituted Trayless Tuesdays. They found that 40% less food was being dumped on Tuesdays compared to other days of the week. So, starting in the fall of 2012, Central became a Trayless Campus.

Howard says the Market also recycles all its cardboard, metal cans, glass and frying oil. In addition, compost is gathered from 12 different dump sites around campus to be used in Central’s organic garden. Nearly all of that produce makes its way back to dishes in Central Market.

It was this commitment to sustainability that led the Department of Natural Resources to award Central the grant for the new food pulper. As Van Kooten put it in the grant:

“The college has been a leader in implementing pre-consumer food waste among Iowa colleges and universities, and will again emphasize Central College’s commitment to the ‘green bottom line.’”

Waste Vegetable Oil Recycling²⁵

Central College donates their waste vegetable oil to Midwest Renewable Biofuels, Inc., who recycles the oil into Biodiesel and other side stream products.

²⁵ Midwest Renewable Biofuels, Inc.: <http://www.mid-iowa-renewables.com/about.html>

Coe College (Cedar Rapids)

Food Waste System Snapshot:

- Composting
- Trayless dining
- Uses pulper to mash food waste

Reducing Food Waste in Dining Services²⁶

- Tom Wieseler, Director of Dining Services, was recognized as the 2012 Iowa Recycling Association's Recycler of the Year. Thanks to his efforts, Coe's Dining Services had been composting all food waste since 2005.
- Worked with the Coe Environmental Club to start the Coe Garden, which grows vegetables—some of which are used in the cafeteria, especially during the summer.
- After doing waste studies "The U" has been trayless since May '09 graduation.
- Future goals include minimizing the amount of waste caused from students taking too much food during meals, and installing a "green" roof on a portion of Gage Memorial Union.

Mission: Zero Waste²⁷

Cedar Rapids, Iowa—At 1,300-student Coe College, dining services is making great strides to become a zero waste campus. Tom Wieseler, general manager for Sodexo at the account, said that during the past several years, the campus has made major changes to reach its zero waste goals, including implementing comprehensive composting, recycling and sustainability programs.

"We'll never get to absolute zero waste, but overall as a college we need to start teaching these kinds of things outside of the classroom," Wieseler said. "We did a tray waste study so we would have a better idea of where we could make changes. Our students waste 3.2 ounces per person at lunch and dinner and 2.5 ounces at breakfast. I consider myself an average male and I eat about 23 ounces of food at lunch and dinner. That means, on average, my students are wasting about 1/7 of what they take. This gives me information I can display and teach them that wasting any natural resource can't go on indefinitely."

Wieseler said he would like to do more research about the amount of food taken and wasted by different groups such as athletes so he could have more comprehensive information to share. When the study was being conducted, Wieseler complied with the environmental club's wishes and displayed the actual waste in bulk in the dining room. So waste from breakfast would be displayed at lunch with appropriate signage and the per-student figures. And although Wieseler admitted this was an in-your-face approach, he found it to be very effective. The department also installed a pulper and since May 2007, Wieseler has been taking that pulped product to a local solid waste facility for composting.

"So far we have diverted 59,080 pounds of waste from the landfill," Wieseler said. "Kitchen food waste is sent to the pulper rather than the trash. During a test period when we went tray optional for student dining, our composted amount went down 300 pounds per week with all other variables being the same."

²⁶ Coe College: <http://www.coe.edu/aboutcoe/coegreen>

²⁷ Food Service Director: <http://www.foodservicedirector.com/trends/going-green/articles/mission-zero-waste>

When trays were optional, 21.6% of students used a tray at breakfast, 44% used one at lunch and 45.9% used trays at dinner. Now that the department tested what going trayless could do for its waste goals, the plan is to go completely trayless this May. Wieseler said all he has left to do is submit an article to the student newspaper explaining that the switch to trayless dining is coming.

"I have to let the students know that this makes an impact," Wieseler said. "May's a good time to roll this out since we're not feeding as many students, then we serve summer camps and then by Fall I'm hoping trayless will be no big deal."

Des Moines Area Community College (Des Moines)

Food Waste System Snapshot:

- Composting
- Vermicomposting

Composting/Vermicomposting²⁸

They are composting yard waste and food scraps, using a combination of outdoor composting and vermicomposting as a pilot project on their Urban campus.

Des Moines University (Des Moines)

Food Waste System Snapshot:

- Solid waste reduction and recycling

Conservation and Sustainability (CnS)²⁹

Comprised of students, faculty, and staff who are dedicated to finding ways to make DMU a "greener" campus. CnS also identifies additional options to promote sustainability in campus operations. The areas through which DMU supports sustainability include solid waste reduction and recycling, energy conservation and efficiency, transportation, food service, campus grounds and campus planning.

²⁸ ACUPCC Reporting System: <http://rs.acupcc.org/cap/588/>

²⁹ Des Moines University: <http://www.dmu.edu/student-services/student-life/student-leadership/>

Drake University (Des Moines)

Food Waste System Snapshot:

- Trayless dining
- Source reduction by using a food management system
- Composting

Trayless Dining³⁰

When students use plates without trays the amount of food waste decreases by one ounce per plate.

Continued Training and Utilization of a Food Management System³¹

Managing food waste in a sustainable way through continued training of our teams and continued utilization of a Food Management System to find the best management practices for food at the stages of purchasing, menu planning and meal preparation, as well as after the meal has ended. As Sodexo continues to utilize these key elements in managing daily operations, an additional benefit has been recognized for staff training on the correlation between menu planning and the environmental impact of food waste reduction.

Composting³²

Sodexo has implemented a new composting program. Food scraps & other organic wastes are now placed in composting bins behind scenes. Yes, even the Xpress napkins are compostable!

Graceland University (Lamoni)³³

Food Waste System Snapshot:

- Source reduction by using SOMAT waste reduction technology

Graceland has a solid waste management policy to reduce the amount of waste hauled to and disposed of in landfills or incineration facilities.

Graceland owns and operates SOMAT waste reduction technology for leftover food scraps for campus food services.

³⁰ Drake University: <https://drake.sodexomyway.com/planet/local.xhtml>

³¹ Drake University: <https://drake.sodexomyway.com/planet/local.xhtml>

³² Drake University: https://drake.sodexomyway.com/Images/Composting%20Sign-Why%20are%20the%20trash%20cans%20missing%20in%20Hubbell%208-23-2012_tcm34-4028.pdf

³³ Graceland University: https://my.graceland.edu/ICS/Resources/Campus_Sustainability/Sustainability_at_Graceland_University/

Grinnell College (Grinnell)

Food Waste System Snapshot:

- Recycles cooking oil
- Composting
- Uses pulper to mash food waste

Waste Vegetable Oil Recycling³⁴

Grinnell College donates their waste vegetable oil to Midwest Renewable Biofuels, Inc., who recycles the oil into Biodiesel and other side stream products.

Dining Waste Composting Project³⁵

Grinnell College is currently composting approximately 51 tons of food waste during the school year. All food waste, including paper products, is sent through a pulping machine. The resulting organic matter is collected in barrels and taken to a local farm each morning. This matter is combined with wood chips at the compost site. The farmer spreads the resulting compost at least twice a year. Collecting the pulped food also allows for the indirect tracking of food waste.

Small Private College and Local Farmer Divert Food Waste from Landfill³⁶

The Problem

In Iowa, Grinnell College was in the planning stage to build a brand new facility to serve as a central gathering place, campus offices, and dining halls and kitchens. To accommodate the college's sustainable ideology, Grinnell was able to plan their dining facilities and kitchens to include food waste reduction and diversion operations. In 2006, the Joe Rosenfield Center officially opened. Jeanette Moser, associate director of dining services, stated that "Building a new facility helped implement our plan to reduce food waste because we are committed to do the right thing."

Grinnell College's Dining Services feeds approximately 2,230 students, faculty, staff and visitors per day in their Marketplace cafeteria. Serving this many people results in food waste. However, instead of simply sending their food waste to the landfill, Grinnell College took an environmentally conscientious step and found an alternative for their pre- and post-consumer food waste.

The Solution

First, food left on trays and plates from the dining center as well as food scraps from the kitchen are scraped into a food pulper that grinds down the food and removes excess water. The food waste is then deposited into numerous large recycling containers which are picked up by the college's facilities management and transported to a local farm owned by Howard McDonough once per day.

Situated on McDonough's property are giant piles of compost with peppers, onions, avocados, and other foods peeking out of the fresh deposits delivered from Grinnell College. McDonough mixes bedding material from the local 4H Fairground with the food waste from Grinnell. Each pile is turned with an end loader once a month until the compost fully matures into a nutritious soil amendment that

³⁴ Midwest Renewable Biofuels, Inc.: <http://www.mid-iowa-renewables.com/about.html>

³⁵ Grinnell College: <http://www.grinnell.edu/etal/green/dining/waste>

³⁶ Iowa Waste Reduction Center: <http://www.iwrc.org/index.cfm/linkservid/C427E90D-D0BB-A779-01EC6BA65AE2F4BB/showMeta/0/>

will eventually benefit plants and crops. From start to finish, the materials that makeup the compost reduces by 75%.

The Results

McDonough believes the nutrients in the compost give him great crops. He spreads the compost on his pumpkin field and also uses it for community projects where landscaping and flower beds are needed in the city of Grinnell. McDonough could not be more pleased with the end product but he does have one complaint – the starlings. They are a nuisance and love to eat from his compost piles. Otherwise, rodents are never an issue for the Grinnell farmer and odor is only noticeable for a short time after he turns his compost pile.

This beneficial partnership is just one way in which food waste diversion can occur easily and beneficially. Grinnell College is able to divert approximately 1,500 pounds of food waste from landfills every week and McDonough is able to produce compost for himself and projects throughout the city of Grinnell.

In the future, McDonough would like to see more paper products composted. He believes newspapers, coffee filters, paper plates and towels are some of the items that would compost easily and should be included to increase waste diversion from the landfill. He would also like to see more farmers throughout the state implement a similar composting program that would help reduce the amount of food waste entering Iowa landfills.

Indian Hills Community College (Ottumwa)

Food Waste System Snapshot:

- Recycles cooking oil

Waste Vegetable Oil Recycling³⁷

Indian Hills donates their waste vegetable oil to Midwest Renewable Biofuels, Inc., who recycles the oil into Biodiesel and other side stream products.

Iowa Lakes Community College (Emmetsburg)

Food Waste System Snapshot:

- Trayless dining

Trayless Dining³⁸

Iowa Lakes' Food Service implemented trayless dining fall 2009. Trayless dining conserves energy needed to heat water, saves one-third to one-half gallon water per tray, reduces chemicals used, and helps lessen Iowa Lakes' ecological footprint. Trayless dining also helps raise the social awareness of

³⁷ Midwest Renewable Biofuels, Inc.: <http://www.mid-iowa-renewables.com/about.html>

³⁸ Iowa Lakes Community College: http://rs.acupcc.org/site_media/uploads/cap/297-cap.pdf

their students and employees. Daily they are reminded of Iowa Lakes' efforts to "go green" and reinforce sustainability awareness. Trayless dining has decreased the amount of food waste going to the landfill. Aramark reports that food waste quantity is reduced by 1.2 ounces to 1.8 ounces per person per meal when trays are removed from dining venues; this represents a 25% to 30% reduction in per-person waste per meal.

Iowa State University (Ames)

Food Waste System Snapshot:

- Trayless dining
- Recycles cooking oil
- Composting

Composting³⁹

Thanks to a large amount of student support for the program, ISU Dining began composting in order to make food waste more useful. By using pulpers to decrease the water content within the food waste, the weight of the waste that needs to be transported to the composting facility is decreased. Finally, not only does composting prevent waste from entering a landfill, but by composting waste there is a large reduction in the amount of contaminants from run off waste leaking into our water supply. ISU is able to use the final compost as a component to create good soil that can be used around new and existing buildings on campus.

Trayless Dining⁴⁰

All three of ISU Dining's residential dining centers have "gone trayless" with the support of students, in order to decrease the amount of food waste that is generated daily by each dining location. By going trayless, guests pick up less food and therefore, waste less when they are finished with their meal.

Prior to going trayless in 2009, Union Drive Marketplace's amount of food wasted per guest was 0.36 pounds. This same year, Season's Marketplace was converted to trayless dining and the amount of food wasted per guest was only 0.22 pounds. By going trayless, ISU is saving about 0.14 pounds of food waste per person each day.

BioBus⁴¹

ISU BioBus is an interdisciplinary entrepreneurial student initiative that recycles waste vegetable oil from ISU campus dining facilities into biodiesel fuel to power the city of Ames' CyRide buses. Biodiesel is a non-toxic, biodegradable alternative to fossil fuels. This biofuel significantly reduces harmful emissions and can be used in virtually any diesel engine with little to no modification. While the overt goal of the organization is to increase environmental sustainability at Iowa State by recycling, the underlying emphasis is to create an experiential learning program to integrate students, faculty, and the community.

³⁹ Iowa State University: <http://www.dining.iastate.edu/sustainability/composting>

⁴⁰ Iowa State University: <http://www.dining.iastate.edu/sustainability/trayless>

⁴¹ Iowa State University: <http://www.dining.iastate.edu/sustainability/other-initiatives>

The club is currently comprised of a diverse group of students in business, engineering, agricultural, and bio-renewable technology fields, which provides a unique platform for cross-disciplinary learning and sharing while working towards a common goal. The ISU BioBus Club accepts students of all majors and backgrounds. In addition to all that BioBus is currently doing, BioBus and faculty across ISU are also working to setup courses to encourage further involvement and learning by students at all levels, through interactive classroom learning

Kirkwood Community College (Cedar Rapids)

Food Waste System Snapshot:

- Composting

Composting⁴²

GreenRU and Kirkwood Community College partnered to compost waste material at the Kirkwood Class Act Restaurant and culinary kitchens.

Loras College (Dubuque)⁴³

Food Waste System Snapshot:

- Composting
- Trayless dining
- Source reduction

Loras College Campus Dining is continually increasing its sustainable practices while serving the campus community high quality foods with top-notch customer service. Below is a list of their current sustainability initiatives (as they relate to food waste).

Waste Reduction & Recycling

- Compost food scraps.

General Sustainable Efforts

- Campus Dining is eliminating the use of trays in the Cafe for select days to eliminate the need for unnecessary food waste and water/chemical usage.
- Repurposing of scrap or unconsumed food items when appropriate for soups, stocks, etc.
- Properly filtered fryer oil to extend oil life.

⁴² GreenRU: <http://www.greenru.org/20130502155718882.pdf>

⁴³ Loras College: <http://www.campusdish.com/en-US/CSMW/Loras>

Luther College (Decorah)

Food Waste System Snapshot:

- Composting
- Zero waste picnic
- Trayless dining
- Food, purchasing, and waste task group
- Recycles cooking oil

Composting⁴⁴

Food waste composting at Luther College has been going on for twelve years. It was pioneered in 1997 by Bob Chapman, a former facilities staff member who had a personal interest in composting. The system at Luther has seen a variety of incarnations, but currently, food waste composting at Luther occurs at three dining locations: the cafeteria, Marty's, and Oneota Market. Student workers pick up compost from the union dock on a daily basis and haul it to a central passive composting pile for processing before use on campus.

Pre-consumer Composting

Pre-consumer compost is collected in the kitchens of the cafeteria, Marty's, and Oneota Market. Fruit and vegetable peelings and trimmings make up most of the compost stream, along with certain types of paper, coffee grounds, coffee filters, and egg shells. Food waste is not composted in the dish room or in other parts of the kitchen. Some leftovers are composted, mostly rice, never protein products, and rarely pasta (plain pasta rarely goes to waste).

Post-consumer Composting

The cafeteria on campus offers post-consumer composting. Post-consumer compost in the cafeteria is collected in two blue bins at either end of the tray return, adjacent to brown trash bins. The bins are clearly marked by labels both on the wall above each respective bin, and on the bins themselves. There are also signs above each compost bin denoting what food items are compostable and which should not be composted.

Zero Waste Picnic⁴⁵

First-year students and their families are introduced to the college's sustainability ethic—and its great food—at the Luther Zero Waste Picnic during orientation in August.

Over 1,000 people gather on Luther's central campus to take part in the picnic. Grass Run Farm Burgers and other local foods are served on more than 1,500 flatbread plates—all made in the Luther bakery and all of which were composted after the event. Additionally, real glasses and silverware are used in an effort to eliminate the waste from thousands of paper or plastic utensils.

As guests learn about sustainability at Luther and the benefits of local foods, they are encouraged to take only what they can eat and compost all they could not finish—scraping leftovers onto a compost pile and tossing the edible plates onto Plate Mountain. The event demonstrates to incoming students

⁴⁴ Luther College: https://www.luther.edu/sustainability/waste_recycling/composting/

⁴⁵ Luther College: <http://www.luther.edu/sustainability/food/education/zerowaste/>

that Luther is committed to sustainability, a message many will carry throughout their four years at Luther and beyond.

Planning for the event is a collaboration between the Luther Student Life Office and Luther Dining Services.

Food, Purchasing and Waste Task Group⁴⁶

This committee is made up of faculty, staff and students who get together once a month to discuss food, purchasing and waste issues on campus.

Trayless Dining⁴⁷

In an effort to prevent food waste and precious water resources, Luther College, in 2009, made the decision to go trayless. By washing 3,000 less trays per day, the dishroom is now running the dishwasher 2 hours less per day, which saves 700 gallons of water. Energy it takes to heat up the water has therefore been reduced.

Biodiesel⁴⁸

In 2005, Luther began converting waste vegetable oil from campus dining locations like Marty's, the Cafeteria, and Oneota Market into biodiesel. The biodiesel is used in vehicles on campus. Luther converts 100% of its waste vegetable oil into biodiesel. That waste vegetable oil from Dining Services amounts to 1200 gallons of biodiesel per year.

Maharishi University of Management (Fairfield)

Food Waste System Snapshot:

- Trayless dining
- Vermicomposting

Trayless Dining⁴⁹

On August 9, 2010, Maharishi University of Management removed its trays from the dining hall. This is part of a nation-wide trend.

Environmental benefits of trayless cafeterias:

- Conserves water and electricity.
- Reduces water pollution (detergents, drying agents, etc.).
- Decreases food waste.

When given a tray, the tendency is to fill it up with more than you can eat. One survey showed a 25-30% drop in food waste after trays were removed from school dining halls. Maharishi University of Management's food waste was nearly 800 lbs/day.

⁴⁶ Luther College: <http://www.luther.edu/sustainability/food/education/committees/>

⁴⁷ Luther College: <http://www.luther.edu/sustainability/about/commitments/deptinitiatives/dining/>

⁴⁸ Luther College: <http://www.luther.edu/sustainability/about/commitments/deptinitiatives/dining/>

⁴⁹ Sustainable Living Tips by Lee Leffler: <http://leeleffler.com/?cat=5>

Vermicomposting⁵⁰

The University's plan to eventually recycle all food waste by using it as compost got a boost in 2008 thanks to the allocation of a building that houses the campus vermicomposting project — a project that saves the University money, saves the environment, and contributes to the nutritional quality of food.

The building is located north of campus and is used by the Department of Sustainable Living for storage and projects as well as composting.

Vermicomposting is the use of worms to break down the food waste, says sustainable living faculty member Alex Kachan. Its advantages over regular composting include: 1) the organic material is broken down more quickly, 2) the end product is more biologically active, 3) the nutrients are more readily available to the plants, and 4) the worms aerate and break down organic material not easily composted conventionally, such as food cooked in oil, cardboard, and the biodegradable paper plates sometimes used in the dining hall.

Mr. Kachan explained that vermicomposting complements rather than replaces conventional compost. "The way I like to think about it is that conventional compost is food for the soil, and vermicomposting is the dessert."

Currently organic waste from Golden Dome Market is collected and transported to two composting bins at the new venue. Mr. Kachan intends to expand, with a goal of using all of an estimated 1,500 pounds of scraps generated each day by the dining hall. Currently about half of that is being collected daily and composted conventionally.

Mr. Kachan said that it costs \$45/ton to dispose of the waste at the regional landfill, in addition to the cost of maintenance and fuel for transporting. The Sustainable Living department hopes that not only will this project save money but also will become financially self-sustaining by making some of the worm castings available commercially.

Morningside College (Sioux City)

Food Waste System Snapshot:

- Trayless dining

Trayless Dining

Morningside College will periodically have a week of trayless dining in order to reduce the amount of food and water wasted.

⁵⁰ Maharishi University of Management: <http://mumchina.org/sustain/vermicomposting.html>

Mount Mercy University (Cedar Rapids)

Food Waste System Snapshot:

- Trayless dining
- Recycles cooking oil
- Composting

Ongoing sustainability efforts (as they related to food waste)⁵¹

- Trayless dining, reducing food waste by 67%, went into effect fall 2008.
 - Through a partnership with Linn County Solid Waste Agency, the remaining food waste is diverted out of the landfill and piloted to a composting facility.
- The Biodiesel project, converting waste vegetable oil to biodiesel fuel (partially funded by Rockwell Collins), began fall 2010.

Mount Mercy recognized for diverting 15 tons of food waste from local landfills⁵²

April 26, 2013 – Mount Mercy University was recognized by GreenRU for a successful food diversion project on Tuesday, April 23. In just three months, Mount Mercy diverted 15 tons of waste from local landfills. The project is in partnership with Linn County Solid Waste Agency and GreenRU. The project was funded through grant money made available by the Solid Waste Agency's Commercial Food Scraps Recycling Pilot Project, which is open to all Linn County businesses interested in recycling food waste.

Landfill space continues to shrink, and creating more landfills can be a controversial issue in communities. Waste hauling costs are also on the rise, making long distance shipping of waste cost prohibitive. Food waste accounts for approximately 15%, or 20,000 tons (40,000,000 pounds), of material at landfills annually in Linn County. Food decomposing inside a landfill creates methane, a greenhouse gas, which is 20 to 25 times more potent than carbon dioxide.

"While landfill methane capture systems are beneficial, they do not capture 100% of methane emissions," said Mount Mercy's Assistant Dean of Adult Accelerated Programs Colette Atkins. "Mount Mercy is pleased to partner with Solid Waste Agency and GreenRU for this very important project that is benefitting our community and our environment."

Pre-consumer kitchen food scraps were collected using compostable bags, which were stored in buckets, gallon carts, and three-yard "organics only" dumpsters. The project investment for a 14-week period totaled \$1,471.80. Mount Mercy started the project on October 18, 2012, having organic waste picked up on a weekly basis by GreenRU 40-foot organics-only trucks/trailers.

As the project moves forward, Mount Mercy will work with GreenRU and Solid Waste Agency to improve and expand the organic recycling initiative. Organic waste materials contain valuable nutrients vital to agricultural production and healthy soils. These nutrients are lost once buried inside a landfill and must be artificially replicated through use of oil-based, non-renewable fertilizers.

⁵¹ Mount Mercy University: <https://www.mtmercy.edu>

⁵² Mount Mercy University: <https://www.mtmercy.edu>

Northwestern College (Orange City)

Food Waste System Snapshot:

- Trayless dining

Trayless Dining⁵³

Northwestern College is trayless in their cafeteria, which saves both food waste and dishwashing energy.

Simpson College (Indianola)

Food Waste System Snapshot:

- Composting
- Recycles cooking oil

Composting Progress Made at Simpson College⁵⁴

April 20, 2013 – Since Monday, March 28th, the first day of EAC’s Green Week, food waste has been continuously composted from Pfeiffer. An average of 200 lbs of food waste has been taken from Pfeiffer each week, which is a huge accomplishment!

This is generating a lot of compost and keeping a lot of food waste out of the landfill. Every day, an EAC member takes the compost from Pfeiffer and dumps it in a pile next to the organic garden where it will eventually mature into rich, nutritious soil that can be used on the garden or by campus services for other areas of the campus.

It is important to know that everything made of organic, living material will break down eventually, but not all organic material is good for composting. Meat, dairy, and eggs (animal products) should not be composted because they will produce a bad smell and attract animals. Virtually all other food in Pfeiffer, such as rice, pasta, bread, fruit, and vegetables, can be composted with good results.

Napkins and teabags are also good materials for compost since they are made of plant matter. Thanks to everyone who made this compost system possible, and thanks to all who are diligently composting their leftover food and napkins. Our efforts are continually making the campus more environmentally friendly, and we couldn’t do it without you!

Biodiesel⁵⁵

February 21, 2013 – The president of Simpson College, John Byrd, has signed the American College & University Presidents’ Climate Commitment. This effort is supported by many colleges & universities across the nation to make efforts on their campuses towards climate neutrality & sustainability.

⁵³ Northwestern College: <http://www.nwciowa.edu/campus-life/green-living>

⁵⁴ Simpson College Sustainability: <http://simpsoncollegesustainability.wordpress.com/>

⁵⁵ Simpson College Sustainability: <http://simpsoncollegesustainability.wordpress.com/>

In order to assist in this mission, the Student Government Association for Simpson College purchased a biodiesel processor in 2008 in order to turn waste oil from our cafeteria into diesel that can be used in many of the vehicles currently in use by campus services.

One of the key people in our sustainability efforts at Simpson College is Jeff Wagner, the Director of Campus Services, who works with the biodiesel processor on campus.

Jeff was more than willing to share about their experience and the success it's had on campus. Here's what he had to say:

"Once we acquired the processor, we had to find a good location for it. Ours is set up indoors and it is vented to the outside. Since biodiesel gels at higher temperatures than regular diesel, a climate controlled location is ideal for production and storage.

We then needed a source for used frying oil, methanol and lye. We get all of our oil from the campus dining hall. I purchase the methanol in 55 gallon drums and the lye in 40 lb. bags. Both of these products are readily available, inexpensive and easy to find. I use approximately 8 gallons of methanol and 3 lbs of lye per 40 gallon batch of fuel. The exact "recipe" is determined by the type of waste oil that is used. The key to making high-quality biofuel is making sure that the measurements are exact. A general understanding of the chemical reaction that takes place (transesterification) is also helpful.

The entire production process takes one day to complete – and it is not at all labor intensive. It takes about one hour of my time per 40 gallon batch. Currently, I am producing our fuel for \$.81 per gallon – not bad when you consider current diesel fuel prices. Other benefits include an 85% reduction in emissions, a 100% biodegradable and non-toxic fuel, and the exhaust smells like the food that was cooked in the oil."

St. Ambrose University (Davenport)

Food Waste System Snapshot:

- Trayless dining
- Composting

Food Waste Reduction Initiatives:⁵⁶

- Trayless dining.
- Composting.

GreenLife Raises Awareness on Going Green⁵⁷

December 2010 – Royal blue is the color for recycling, not green. Blue bins occupy dorm rooms, hallways in the lecture buildings, and plenty of library space. Paper, plastic, cardboard and aluminum cans are tossed into these bins every day. If someone had not taken the initiative to implement these notorious blue bins, St. Ambrose University would not be quite as green as the campus is known for.

⁵⁶ St. Ambrose University: http://www.sau.edu/Campus_Life/Student_Affairs/Dean_of_Students/Sustainability.html

⁵⁷ St. Ambrose University: http://www.sau.edu/News_and_Events/120910_GreenLife_Raises_Awareness_on_Going_Green.html

Green is the color for preserving the environment. Green is the color more students and faculty are striving to represent our campus with. GreenLife is the group on campus that is raising awareness of this important movement.

Back in October, the student-based group called GreenLife awarded students, faculty and staff with an oak sapling for the first annual GreenLife awards. The awards were given on Oct. 4, on the Feast of St. Francis of Assisi, patron saint of the environment.

Among the GreenLife award recipients was Stephen Finn, the general manager of Sodexo Food Service. Finn was awarded for going trayless in the cafeteria, being committed to buying local and healthy foods, and for making use of campus compost boxes. Finn said he knows that taking away the trays in the cafeteria has been extremely environmentally helpful.

"Going trayless has shown tremendous reduction in food waste," Finn said. "The move has cut down about a third of our food and energy waste."

Taking the trays out of the cafeteria was a bold move made a couple years ago by Sodexo, but Finn said students are coming around to it.

"People are taking what they can eat and using less dishes," Finn said.

The students have accepted that the trays will not return and that it is for the better cause. Finn and his staff are also trying to cut out all Styrofoam containers. For those who need to take a lunch to go, mostly faculty members, they are implementing an environment-friendly container for members to bring back each time.

Dean of Students Tim Phillips was also awarded for his green efforts on campus. Phillips is responsible for the recycling program, residence hall efforts, campus-wide conversations, and bringing in national environmental experts.

"The award is less about me," Phillips said, "and more about bringing recognition to the initiative being made on campus. I get the credit for the work of a lot of good people."

Phillips was awarded for taking leadership and pulling people together to talk about sustainability.

Finn and Phillips are also green in their personal lives off campus. Finn said his family recycles at home and does their own composting. They also get more use out of the local farmer's market in the summer. Phillips stays green at home by carpooling and abstaining from bottled water.

In addition to the awards, recipients and members of GreenLife have recently presented a petition to Sister Joan Lescinski with a total of 400 signatures, including a signature from Lescinski herself. In honor of 10/10/10, GreenLife used this as a day to put emphasis on sustainability and presented a list of demands and requests.

A few of these requests include: enhance environmental education in course work and co-curricular programming, create meal plan policies that discourage over-consumption, ban bottled water from campus vending machines and food outlets, and offer students a "green rebate" for completing a sustainability covenant (reduce waste of food, paper, energy; taking a green course; not owning a car, etc.).

Phillips said Lescinski is affirming the efforts of GreenLife.

While blue bins and the absence of trays continue to show the green in St. Ambrose, a lifestyle change is crucial for all students and faculty who hope to lessen their carbon footprint and emphasize the green life.

University of Iowa (Iowa City)

Food Waste System Snapshot:

- Composting
- Donation
- Trayless dining
- Uses pulper to mash food waste

Composting⁵⁸

In 2007, the University of Iowa and the Iowa City Landfill Recycling Center began a pre-consumer food waste composting pilot project that has since grown into a University-funded program composting over 80 tons of food waste. The original study and pilot were initiated by a student research project for Prof. Jerry Schnoor's class, Engineering for a Sustainable World.

Each semester, about 12 tons of food waste from Hillcrest and Burge dining halls is composted with other organic waste at the Iowa City Landfill and Recycling Center. When the compost is ready, some is returned to campus as a soil amendment for the Student Garden and the rest is sold to the public as one component of Iowa City Community Compost.

In the 2010 spring semester, a second group of students from Dr. Schnoor's class is studying the possibility of including post-consumer food waste in the UI program. This addition could potentially divert another 350 tons of food waste from the landfill. Besides reducing waste the UI sends to the landfill, the inclusion of post-consumer waste will allow the City to offer the program to other businesses in Johnson County.

Donation⁵⁹

Catering service donates any leftover food to Table-to-Table, a local food recovery organization.

Food Pulper/Trayless Dining⁶⁰

Implementing sustainable practices on the University of Iowa campus requires creativity, attention to detail, and in-depth research. For Fred Kurt, operations manager at Hillcrest Market Place, improving sustainability also means saving money and increasing productivity while continuing to serve 3,250 meals to students daily.

"I was always digging for the details, doing audits finding out how much waste we have, how much is it going to cost over the course of a year, how much water usage difference will it be to try new systems," Kurt says.

In the Hillcrest Market Place, Kurt found that University Housing and Dining could save about 1.5 million gallons of water each year by switching out the old dishwashing machine for a new system that includes a food-pulping machine. The change could save over \$17,000 a year in water and detergent costs.

⁵⁸ University of Iowa: <http://sustainability.uiowa.edu/dining/>

⁵⁹ University of Iowa: <http://sustainability.uiowa.edu/dining/>

⁶⁰ University of Iowa: <http://now.uiowa.edu/2013/03/less-water-less-waste>

Less water, less waste

The food pulper, which was installed in fall 2012, grinds up leftover food waste, extracts the water, and reuses the water for the garbage disposal. This not only saves money on water, but also saves greenhouse gas emissions from the municipal City of Iowa City waste-water treatment plant.

Before the new pulper, post-consumer food waste equaled 8,533 pounds per week going into the waste-water system. After the food pulper installation, the amount of waste dropped to about 2,800 pounds per week—a 66% decrease. That waste now goes to the Iowa City compost operation.

“Because that pulper grinds up all the food waste and extracts the water, it reduces the weight volume by about 80%,” Kurt said. “Otherwise, it’s a tremendous amount of food waste.”

Some funding for the \$45,000 pulper came from a Solid Waste Alternative Programs (SWAP) grant from the Iowa Department of Natural Resources. The project’s multi-faceted benefits, including saving water to reducing methane gas, were appealing to the DNR.

Campus collaboration

The grant provided \$20,000 for the project. To meet the gap in funding, the Housing and Dining Sustainability Committee applied for a matching grant through the Office of the Vice President for Research and Economic Development. Writing the grant was a collaborative effort by the UI Office of Sustainability and Housing and Dining.

Liz Christiansen, director of the Office of Sustainability, was particularly happy both about the cost savings and the multiple ways in which sustainability was improved by the project.

“With the grant, along with the savings we would see with water, waste-water usage, and landfill fees, the payback should take less than three years,” she says.

The research and funding phase for the project lasted two and a half years. Although the process was lengthy, Housing and Dining wanted to be sure the system would be successful for years to come.

“One of the reasons why it took us so long from start to finish is because at first we were just going to add the pulper. But then we thought, ‘Wow, we can certainly do a lot with our new residence hall coming in,’” Kurt says.

An entire dish room remodel was required to accommodate expansions in composting and recycling for current and new students. This included a new belt system, a dishware accumulator, a new dishwasher, and the new food pulper.

Going trayless

Eliminating trays was an integral part of the new dish washing system. Going trayless encourages healthier eating habits and reduces food waste by making it more difficult for patrons to overload on food. Chemicals and water used to clean trays were eliminated. Finally, a trayless system allows for ergonomic and productivity enhancements for Market Place employees.

Some who were used to the old system complained, but as they discovered the benefits for the university and the environment, students seemed to embrace the change.

“Going trayless gave me butterflies in my stomach as we got closer to doing it, wondering what students were going to think of it,” Kurt says. “It’s been a success and we’d like to expand on that down the road with our other campus dining operations.”

The success of both the trayless initiative and the food pulper is in the numbers. According to Kurt, there has been a 5% reduction in food purchases by Housing and Dining, which equals almost \$100,000 in

savings. With the new dish room, water usage has declined from about 350 gallons per hour to 50 gallons per hour.

“Going from 350 gallons to 50, there’s not going to be a high need for the use of chemicals,” Kurt says. “We were washing 4,500 trays a day, and handling those trays takes labor, chemicals, and water.”

Model for sustainability

Other university food retail outlets are excited about the success of this project and are making plans to improve sustainability in their operations as well.

“They want to do it in Burge right away, but with the size and scale of the operations, it’s just a little bit different,” Kurt says. “It’d be a little bit more difficult to do, but we do plan and intend on doing so in the future.”

Hillcrest Market Place has served as a great model for sustainability at the university. Other sustainability improvements in recent years include eliminating Styrofoam; using compostable to-go containers; promoting healthy, local foods; and using greener cleaning products. In the greater scope, Housing and Dining is taking the university and local institutions one step closer to meeting targeted sustainability goals.

“Housing and Dining have challenged their staff to be much more sustainable and embed sustainability in their decision-making process, which is really wonderful,” Christiansen said. “They’ve really been a great model for us and other institutions in the area.”

University of Northern Iowa (Cedar Falls)

Food Waste System Snapshot:

- Composting
- Source reduction by using Food Pro program
- Trayless dining

Composting/Source Reduction⁶¹

UNI explores composting options to reduce food waste

December 6, 2012 – A University of Northern Iowa student sends his tray to be washed at the Rialto Dining Center.

The University of Northern Iowa Department of Residence and UNI Facilities have collaborated since last spring to test a potential composting program and reduce waste from the dining centers and retail stores on campus.

In the past, UNI Facilities composted leaves and yard waste. After visiting Iowa State University last spring to observe the composting program there, Paul Meyermann, assistant director of operations planning at the physical plant, said UNI is taking a closer look at its own composting program and the potential of composting food waste.

⁶¹ University of Northern Iowa: <http://www.northern-iowan.org/uni-explores-composting-options-to-reduce-food-waste-1.2801322#.Ubd9cUDU9OI>

Fresh Beginnings, a centralized commissary/bakery production facility in the Redeker Center, has played a part in the testing of the composting program. Bakery and commissary manager Cathy Moore said Fresh Beginnings has composted close to 750 pounds of pretable waste a week. Pretable waste includes produce such as vegetables and fruits.

“We’re providing the backbone for retail and dining to produce the recipes they need,” Moore said, describing the role of Fresh Beginnings.

Moore said fewer than 10 pounds of food are wasted per week, even though Fresh Beginnings produces a high volume of ingredients such as meat, cheese, vegetables and bread.

The lack of food waste is thanks to a computer program called Food Pro that all of the dining centers use to determine how much food is needed for a particular day, based on past dining history.

Along with Food Pro, the reactionary abilities of Fresh Beginnings also limit food waste. Since Fresh Beginnings processes, cleans and bakes its own ingredients, if a dining center has an overabundance of a certain food, they will contact Fresh Beginnings and tell them to produce less of an ingredient.

“We really don’t throw away a whole lot,” Moore said.

Carol Fletcher, assistant director of residential dining, said that while the university currently composts 750 pounds of food a week, she sees that amount rising to 3,000 pounds soon. If UNI decides to expand its composting program, Fletcher said the university by itself will not be able to handle all of the food waste.

Fletcher cited past difficulties in trying to find a conveniently located outside source that was willing to help with recycling on campus.

“I hope that some outside organization will step up to the plate and say, ‘Hey, we would like to be a part of this,’” Fletcher said, referring to the potential expansion of the composting program.

While Fletcher said people may be initially shocked by the amount of food produced by UNI, placed in comparison to the average amount of food waste per American family, the amount of waste is actually minimal.

Moore said the reduction of food waste creates cost savings. For one “unit,” which includes Piazza, Rialto and UNI catering, Moore said \$600 is saved at each unit each week.

The University of Iowa and ISU compost the food waste from their universities.

Iowa began composting its pre-consumer food waste in 2007 and has composted over 80 tons of food waste, according to their website.

At Iowa State, ISU Dining collaborates with its composting facility — a facility that can handle more than 10,000 tons of organic waste annually. Presently, their facility generates 100 tons of compost each week, according to their website.

ISU Dining is currently conducting tests to determine how much waste is produced each day.

“There are some places that do it in a big way, but they have the space and the place to do it,” Moore said. “When you compare the campus space at a place like Iowa State to UNI, we’re not going to be able to do it at the same grand scale they have.”

“The less that we put in our landfill, the better,” said Susan Graves, UNI junior and president of the Student Nature Society. “Especially since the waste can be used for other means, I think that’s a great idea.”

Kara Poppe, a sophomore who is part of Green Project UNI, Northern Iowa Energy Corps and Student Nature Society, believes the university could do more with its current composting program.

“I visited a few universities that currently are doing post-consumer composting in their dining centers ... it would be awesome if UNI could get that on campus,” Poppe said. “But it’s huge that we’re simply experimenting with composting.”

Trayless Dining⁶²

During a pilot study conducted during Spring Semester 2009, the University Dining Services determined that for an average week at the two main campus dining centers (Piazza and Rialto), Dining Services would reduce its waste by 3,490 pounds by going trayless.

Based on this information, the University Dining Services has gone to a nearly trayless program by removing most tray locations from the dining centers. The trays are only available to individuals who specifically desire them. Currently the Rialto dining center is greater than 99% trayless, while the Piazza dining center is greater than 75% trayless.

Upper Iowa University (Fayette)

Food Waste System Snapshot:

- Trayless dining

Trayless Dining⁶³

Food trays in the cafeteria have been almost eliminated to reduce water consumption and food waste.

Wartburg College (Waverly)

Food Waste System Snapshot:

- Composting
- Donation
- Trayless dining

Trayless Dining⁶⁴

Wartburg’s Dining Services department has made great strides toward becoming more sustainable. A couple of the more major achievements have been going trayless in the Mensa and purchasing front-loading washers. Going trayless has led to savings in water, the energy needed to heat the water, the number of dishes that need to be done, and the amount of food and water waste generated. The front-

⁶² STARS, a program of AASHE: <https://stars.aashe.org/institutions/university-of-northern-iowa-ia/report/2011-03-02/OP/dining-services/Tier2-1/>

⁶³ Upper Iowa University: http://www.uiu.edu/alumni/bridge/pdfs/Winter_2010-11.pdf

⁶⁴ Wartburg College: <http://www.wartburg.edu/sustainability/>

loading washers, over the period of 48 days, saved 14,976 gallons of water and have decreased the number of loads that need to be done each day.

Composting⁶⁵

In the spring of 2011 the Mensa began composting all pre-consumer waste. Pre-consumer waste consists coffee grinds, egg shells and fruit and vegetable scraps that accumulate in the preparation of the foods. Dining and the Sustainability Office are working together to develop a means of collecting post-consumer compost.

Donation⁶⁶

Excess produce from the Wartburg Garden goes to the Northeast Iowa Food Bank.

⁶⁵ Wartburg College: <http://www.wartburg.edu/sustainability/SEEDS.pdf>

⁶⁶ Wartburg College: <http://www.wartburg.edu/sustainability/>

Grocery Chains / Discount Stores / Food Distributors

Fareway⁶⁷

Food Waste System Snapshot:

- Recycles cooking oil

Fareway recycles 5,000 gallons of waste oil per year.

HyVee⁶⁸

Food Waste System Snapshot:

- Donation
- Composting
- Anaerobic digestion

Hy-Vee has stepped up its efforts to minimize food and organic waste and divert what's left from disposal sites. They do that by:

- Donating surplus, out-of-date or damaged goods to charitable organizations. For example, the product manager in Coralville, Franklin Bys, sends regular shipments of fruits and vegetables to the nonprofit Table-to-Table.
- Converting to pre-trimmed produce and pre-packaged meat to reduce waste and transportation energy use.
- Diverting food and organic waste to composting facilities through several pilot programs.
- They are also researching anaerobic digestion, a process in which micro-organisms convert organic material into harmless, often-times, beneficial byproducts.

Hy-Vee starts composting pilot project in Iowa City, Cedar Rapids

May 2013 – Iowa City and Cedar Rapids Hy-Vee stores will start composting food waste, produce and floral trimmings through a pilot project.

GreenRU, a Des Moines-based organics recycler, will pick up the waste from Hy-Vee stores and haul it to compost facilities in Iowa City, Cedar Rapids and Eddyville, said Demetrios Hadjis, regional sales and marketing director for GreenRU.

Hy-Vee officials would like to see how the pilot works before deciding whether to expand composting to more of its 230 stores in eight Midwestern states, Hy-Vee Spokeswoman Ruth Comer said.

“We have high hopes for the program,” she said.

⁶⁷ Fareway: <http://www.fareway.com/green-initiatives.aspx>

⁶⁸ HyVee 360: <http://www.hy-vee360.com/index.php>

The program will not replace Hy-Vee's donations of edible food to shelters, food banks and food rescues like Table-to-Table, Comer said. The compost project will focus on food that is past expiration or plants that are not edible, such as floral trimmings.

Other stores, including Walmart and Sam's Club, have been composting food waste for several years.

Sam's Club

Food Waste System Snapshot:

- Recycles cooking oil
- Composting

Biodiesel⁶⁹

As part of its commitment to zero waste, Sam's Club has established a way to recycle yellow tallow or grease drippings from rotisserie chickens into usable products such as biodiesel and animal feed.

Impact:

- 195,000 gallons of yellow grease were recycled in 2011.
- 73,000 gallons recycled into biodiesel.
- 116,000 gallons recycled into animal feed.
- More than \$283,000 net revenue YTD.
- 1,443,000 tons of waste diverted (195,000 gallons x 7.4 lbs/gal).

Composting

SMS found newspaper articles that reported Sam's Club composted their food waste; however, SMS was unable to find supporting information through any other sources.

Target

Food Waste System Snapshot:

- Donation
- Composting

Donation⁷⁰

Target is committed to funding programs that support basic needs. They partner with Feeding America in their fight to end hunger and work with them on a program created together called Meals for Minds, which feeds undernourished children so that they can perform better in school. Together with local food

⁶⁹ Sam's Club: <http://samsglobalmedia.cotcdn.rockfishhosting.com/globalmedia/newsroom/files/2012-Sams-Club-Sustainability-Fact-Sheet.pdf>

⁷⁰ Target: <https://corporate.target.com>

banks, they provided students and their families in 31 communities across the country with 22 pounds of food each on a monthly basis, including 25% fresh produce, throughout 2011.

In 2012 they expanded their existing store food-donation program to include a protein-donation program. In partnership with Feeding America, stores donate meats with minimal shelf life to local food banks.

Composting⁷¹

Target supplemented their existing team-member recycling program with a new composting program at their headquarters location in Minneapolis.

Walmart

Food Waste System Snapshot:

- Donation
- Composting
- Recycles cooking oil

Walmart's Zero Waste Program⁷²

Walmart has reduced waste in their U.S. operations by more than 80%, returning more than \$231 million to the business last year. The reduction, which brings Walmart closer to their goal to create zero waste, has the potential to prevent 11.8 million metric tons of CO2 emissions annually.

Their waste reporting system focuses on three core areas:

- Recycling cardboard, paper, aluminum, plastic bags and roughly 30 other items through the Super Sandwich Bale (SSB) program. Items not eligible for the SSB, including wood pallets, polystyrene plastic and apparel, are sent to their return centers for reuse or recycling.
- Donating healthy, nutritious food to food banks around the country.
 - In 2011, they donated 338 million pounds of food to hunger relief organizations – the equivalent of 264 million meals.
- Creating animal feed, energy or compost from expired food and other organic products, following the U.S. EPA's food waste hierarchy.
 - Walmart worked directly with suppliers to turn 1.2 million pounds of recovered cooking oil into biodiesel, soap, or a supplement for cattle feed.

⁷¹ Target: <https://corporate.target.com>

⁷² Walmart: <http://corporate.walmart.com/global-responsibility/environment-sustainability/zero-waste#wasteprogramdetails>

Hospitals

Gundersen Health System (hospitals and clinics located in Wisconsin, Iowa and Minnesota)

Food Waste System Snapshot:

- Source reduction by using LeanPath® program
- Donation

Easy changes help reduce food waste, save money⁷³

One of the key components of any environmental program is reducing the amount of waste that is generated. In 2010, Gundersen Health System embarked on a project aimed at reducing the amount of food sent into the waste stream. Their success is impressive.

As with any dietary program, there will always be some amount of food leftover from the service line and scraps from food prep. However, there wasn't a system in place at Gundersen to track exactly how much, and what, was being thrown away. In July 2010, the Dietary department began using a tracking program called LeanPath®. Their baseline results were shocking: about half a ton of food waste was thrown away every week. That's 24 tons of waste a year. Now, anytime food is thrown away, Dietary staff places it on a scale and enters its code. The data is fed into a software program that gives Dietary valuable information, such as the time of day or day of the week that the most food waste is generated or the type of food that is thrown away most often.

Based on the data, the team has been able to make a number of positive adjustments that have greatly reduced food waste. Many of the changes have been fairly simple, like adjusting the amount of soup that is warmed up at certain times of day or educating staff on how to prepare vegetables so there is less scrap waste, but they've had an impact. From July 2010 through February 2011, food waste decreased by approximately 550 pounds per week, a 50% improvement. Overall, that equates to an average cost savings of \$475 per week for an annual savings of \$25,000.

A byproduct of the food waste reduction program was the creation of a food donation program to the Salvation Army in La Crosse, Wis. Each day, food is left over that is still safe to eat but cannot be served in the hospital due to foodservice regulations. In the past, the food was thrown away. Now Dietary staff package it up, label it and set it aside in the cooler or freezer. A Salvation Army member picks up the food to be served in their soup kitchen. Gundersen has donated just over 1,000 meals a month.

By rethinking how food is prepared and finding ways to use leftovers, Gundersen has made great strides in reducing the amount of food that is being put into the waste stream.

⁷³ Gundersen Health System: <http://www.gundluth.org/upload/docs/WhoWeAre/Green/FoodWaste.pdf>

St. Luke's Hospital (Cedar Rapids)

Food Waste System Snapshot:

- Source reduction by using ValuWaste program
- Source reduction by using 8 Steps program

St. Luke's cutting waste and saving money with a pair of food management programs

August 3, 2011 – Over-production and food waste was taking a big bite out of St. Luke's budget. Like the rest of the nation the hospital has wrestled with increased food costs. Working with Aramark and LeanPath St. Luke's invested in two programs that aimed to help the hospital cut costs in the kitchen without reducing quality.

"ARAMARK said the ValuWaste program would save us 3% in the first year of use and it actually saved us 4%," said Lori Anderson, St. Luke's Dining Services manager. "ValuWaste helped us track what was used and what we had left over. I was surprised by the numbers."

The numbers Anderson is referring to is the amount of pre-consumer waste coming from St. Luke's kitchen. Pre-consumer food waste is food that kitchen staff throws away due to overproduction, expiration, spoilage, trimming or handling issues. When St. Luke's implemented the ValuWaste program it was throwing away 12,946 pounds of waste a month. Today St. Luke's has trimmed its waste to 5,720 pounds a month.

The ValuWaste program requires employees to weigh the food waste from cantaloupe rinds to expired, uneaten turkey. Employees take the food, enter what it is, weigh it and the ValuWaste scale tells the employee how much it weighs and the cost of the waste. That information is recorded and used for improvement.

"It's amazing what our team has been able to do with this program," said Anderson. "All of the St. Luke's Dining Service employees have been enthusiastic and helping us follow the program and continue to look for ways to improve."

Some of those improvements were the result of creating what Anderson refers to as "swat teams." These employees identified ways they could tweak and reduce waste. One adopted improvement was to cook vegetables in half-pans instead of full pans allowing staff to cook the food as it was needed. Additionally they moved up employee break times. In the past kitchen staff would take later breaks and cook additional food to cover the need during their time away. This caused a lot of food waste.

St. Luke's has used ValuWaste for about two-and-a-half years and has saved an estimated 68,000 pounds worth of waste – waste that didn't go to a landfill.

"The kitchen staff is very much on-board with this program," said Anderson. "In fact I see competition between employees to see who produces less waste. Initially when we first implemented the program it was a little extra work but now it's routine."

St. Luke's Dining Services staff prepares about 14,000 to 15,000 meals a week. Serving that many people takes quite a bit of guesswork. But thanks to the acquisition of another specialized food service program Anderson expects to see more savings in the months ahead.

"About three months ago we started using 8 Steps," said Anderson. "This computer program helps us calculate how much food we're going to need based on hospital census. It has been great so far and

pretty accurate. Anytime we can control costs, reduce waste and maintain a high level of quality is win-win situation. It takes a little extra effort but it's worth it in the long run."

St. Luke's is one of six Iowa Health System hospitals that identified cost-saving opportunities in their kitchens.

UnityPoint Health (Des Moines)

Food Waste System Snapshot:

- Source reduction
- Composting

A Successful Program⁷⁴

In an effort to reduce the amount going to landfills, UnityPoint Health - Des Moines, which includes Iowa Methodist Medical Center, Blank Children's Hospital, Iowa Lutheran Hospital and Methodist West Hospital, began a program in 2008 to track kitchen food waste. The staff was trained to weigh and record information pertaining to discarded food such as the type of food and the reason for disposal. This information was utilized to change purchasing and preparation processes to reduce food waste in hospital kitchens through careful monitoring. In 2008, these three hospitals reduced food waste by 70,273 pounds which equated to a savings of \$2,785. Later, the hospitals began collecting food waste in clear buckets to allow for a visual inspection of the amount and types of food waste. After seeing this success, three more UnityPoint Health hospitals, including UnityPoint Health - Cedar Rapids; UnityPoint Health - Waterloo; and UnityPoint - Sioux City; began the same program. By 2011 UnityPoint Health's numbers had grown to 347,514 pounds of reduced food waste and a savings of \$13,196 organization-wide.

The beneficial achievements of the food waste reduction program led UnityPoint Health - Des Moines to reach for further success with new goals. The next step was to implement a composting project that would further divert food waste from Iowa landfills. In the summer of 2011, UnityPoint Health - Des Moines implemented a pilot program at Iowa Lutheran Hospital in Des Moines that allowed for a private company to haul food waste to a composting facility. In the fall of 2012, Methodist West Hospital in West Des Moines was added to the composting project. By the end of 2012, since the inception of the composting project, Iowa Lutheran Hospital had sent a total of 86,953 pounds of both kitchen waste and patient tray waste to a composting facility. Methodist West Hospital had sent 12,460 pounds of food waste to a composting facility in just four months. Due to a reduction in tipping fees, UnityPoint Health - Des Moines also recognized a savings of \$8,700 in 2012.

Laura Ippen is the sustainability coordinator at UnityPoint Health - Des Moines. Ippen states that the implementation of the program was fairly simple despite the large size of the hospital communities and the amount of food produced. One of the biggest challenges for UnityPoint Health - Des Moines was finding a private vendor that could accommodate the hospital's needs in transporting food waste to a composting facility. UnityPoint Health - Des Moines contracted with GreenRU to transport their food waste to a composting facility. Small issues such as food waste bins being too heavy were easily solved with GreenRU by adding carts with wheels.

⁷⁴ Iowa Waste Reduction Center: <http://www.iwrc.org/index.cfm/services/food-waste/case-studies/unitypoint-health/>

Challenges and Recommendations

Ippen has learned from the program's successes and challenges that implementing a food waste diversion program can be done by other large facilities as well. She has recommendations for food waste generators to consider when implementing a food waste diversion program.

- Start with food waste reduction before moving to composting and follow the food waste hierarchy – reduce, reuse, recycle.
- Measure and track food waste to find a baseline and set goals of reduction.
- A well trained, involved staff will contribute to the success of any food waste reduction program.

Future Goals

Through a waste audit in 2012, UnityPoint Health - Des Moines estimated that an additional 135 tons of food waste could be diverted from hospital and medical center cafeterias. Currently, the goal for 2013 is to include cafeteria food waste in the composting program as well as switching to compostable service and tableware. The success of sustainability efforts at UnityPoint Health provides many other organizations in Iowa with a positive mentor and guide to reduce, reuse, and recycle food waste.

University of Iowa Hospitals and Clinics (Iowa City)

Food Waste System Snapshot:

- Composting
- Donation

University of Iowa Hospitals makes changes to reduce food waste⁷⁵

Gazette investigation showed hospital threw away food worth \$181,000 last year

February 8, 2013 – The University of Iowa Hospitals and Clinics said this week it will change procedures to reduce food waste, following a Gazette investigation about the hospital throwing away \$181,000 worth of prepared food last year.

The hospital, which serves about 10,000 meals a day, will eliminate Styrofoam and nonrecyclable plastic from its cafeterias, allowing the hospital to compost food waste, CEO Ken Kates told the Iowa Board of Regents.

“We will cook smaller batches of food based on our customer demand in order to reduce wastage,” Kates added.

Changes will be made by the end of March.

Hospital officials also plan to increase the amount of food they donate to Table-to-Table, an Iowa City nonprofit that delivers salvageable food from restaurants, grocery stores and institutions to agencies that feed hungry people, said Regent Bob Downer, of Iowa City.

⁷⁵ The Gazette: <http://thegazette.com/2013/02/08/university-of-iowa-hospitals-makes-changes-to-reduce-food-waste/>

“The hospital has proceeded very proactively in terms of the concerns raised in your article,” Downer said.

A Jan. 20 Gazette investigation showed UI Hospitals threw away 355,000 servings of food valued at \$181,600 in the year that ended Nov. 30. This was food prepared, but not sold, in seven dining areas in the state’s largest hospital.

The UI Hospital’s 12% pre-consumer food waste is above the 4% to 10% average waste seen at institutions that work with LeanPath, a Oregon-based company that provides automated food waste tracking for schools, hospitals, restaurants and corporations in more than 30 states.

UI Hospitals previously donated only packaged food because they didn’t want to violate state health codes. But donating prepared food is legal as long as hot food is kept above 135 degrees and cold food is kept below 41 degrees, Johnson County Public Health Department officials said.

A 1996 federal law protects food donors from civil and criminal liability except in cases of gross negligence or intentional misconduct.

The UI reported sending between 220 to 330 gallons of waste to the Iowa City Landfill each day. By removing Styrofoam and plastics from the food, more can be composted.

Food waste makes up about 14% of Iowa’s landfills, according to a 2011 waste characterization study. As food breaks down, it generates methane, a potent greenhouse gas. A growing number of waste haulers are adding food scraps to their rounds because of the potential revenue from compost.

UI Hospitals is making other changes to increase recycling by 10% and reduce waste by 10%, Kates said. Officials bought 4,100 desk-side recycling containers for employees and have switched to microfiber mops, which require less detergent.

The hospital is also studying ways to reduce energy use in the heating and electric systems.

Composting option coming for University of Iowa Hospitals cafeteria diners⁷⁶

New effort could boost production of compost, reduce landfill methane

March 21, 2013 – The University of Iowa Hospitals and Clinics will start next week offering food composting for visitors at six dining rooms at the 14-acre health care campus.

The Gazette reported Jan. 20 that UIHC Food and Nutrition Services wasted \$181,000 of food in 2012. The waste amounted to 12% of prepared food in the operation that serves 10,000 meals a day.

The hospital announced in February it would eliminate Styrofoam and nonrecyclable plastic from its cafeterias, allowing waste to be composted, rather than trashed at the landfill.

Starting March 28, the hospital will provide compost bins in each dining area so employees and visitors can sort out leftover food, carry-out containers, paper sacks, straws, silverware, coffees cups and other items for composting.

“All employees of UIHC are encouraged to participate in the new composting program,” said a memo that went out to hospital employees last week.

UIHC compost will be taken to the Iowa City Landfill, which has been composting food since 2007. The landfill, which sells the compost, has run out in recent years because of the popularity of the nutrient-rich material for gardens and landscaping.

⁷⁶ The Gazette: <http://thegazette.com/2013/03/21/compostion-option-coming-for-diners-at-university-of-iowa-hospitals-cafeterias/>

Reducing food waste in the landfill can also decrease production of methane, a potent greenhouse gas, the UIHC memo states.

The hospital also asks employees to bring their own cups to use at ice and water dispensers and to avoid choosing food in take-out containers if they plan to eat it in the dining room.

Hotels

Embassy Suites Des Moines Downtown (Des Moines)

Food Waste System Snapshot:

- Recycles cooking oil

Waste Vegetable Oil Recycling⁷⁷

Embassy Suites donates their waste vegetable oil to Midwest Renewable Biofuels, Inc., who recycles the oil into Biodiesel and other side stream products.

Hotel Ottumwa (Ottumwa)

Food Waste System Snapshot:

- Recycles cooking oil

Waste Vegetable Oil Recycling⁷⁸

Hotel Ottumwa donates their waste vegetable oil to Midwest Renewable Biofuels, Inc., who recycles the oil into Biodiesel and other side stream products.

Marriott

Food Waste System Snapshot:

- Composting

Composting⁷⁹

In 2011, Marriott initiated 38 third-party waste audits and waste characterization analyses to better understand its waste streams. As a result, Marriott-managed properties in the Americas diverted over 12,000 tons of waste from the landfill through recycling and food waste composting.

⁷⁷ Midwest Renewable Biofuels, Inc.: <http://www.mid-iowa-renewables.com/about.html>

⁷⁸ Midwest Renewable Biofuels, Inc.: <http://www.mid-iowa-renewables.com/about.html>

⁷⁹ Marriott: http://www.marriott.com/Multimedia/PDF/CorporateResponsibility/MarriottSustainabilityReport_2011and2012condensed4MB.pdf

K – 12 School Districts

Elizabeth Tate Alternative High School (Iowa City) / Hiawatha Elementary School / West High School (Iowa City)⁸⁰

Food Waste System Snapshot:

- Composting
- Diversion

All have incorporated some level of composting, whether it's just diverting food waste from landfills or also converting it to compost.

Iowa City Regina (Iowa City)

Food Waste System Snapshot:

- Composting
- Donation

Iowa City Regina provides roadmap for reducing food waste⁸¹

Schools, other groups looking for more ways to send food to compost pile

May 1, 2013 –When students at the Regina Catholic Education Center finish the school year May 31, they will have composted more than 11,000 pounds of food waste from their cafeteria since August.

That waste once went to the landfill, where it took up space and generated methane, a potent greenhouse gas. But since August 2011, Regina has been turning food scraps into compost, a valuable soil enhancement for gardeners and home developers.

“I think it’s kind of cool for the environment,” said Regina first-grader Lydia Pritchard, 7, of Iowa City. “People get used to doing (composting), and then they start it at home.”

Regina is among a handful of local K-12 schools joining colleges and businesses looking for ways to reduce food waste. The school of 950 students pays for its composting and recycling program with lower trash hauling fees — a critical factor for other schools considering similar programs.

Waste audit

Recent waste audits of three Cedar Rapids-area schools showed more than 65% of cafeteria trash was food. Eighth-graders at Excelsior Middle School in Marion helped Green Iowa AmeriCorps sort the lunch trash Jan. 25.

⁸⁰ Little Village: <http://littlevillagemag.com/on-the-table-talking-trash/>

⁸¹ The Gazette: <http://thegazette.com/2013/05/01/iowa-city-regina-provides-roadmap-for-reducing-food-waste/>

“Once they got over the initial grossness of sorting through other people’s food, their biggest reaction is how much food is wasted,” said Todd Lane, an eighth-grade science teacher at Excelsior.

Excelsior students collect chip bags and drink pouches for recycling. A parent also picks up leftover food that hasn’t been served to students and feeds it to his hogs, Lane said. But launching compost programs can be challenging because of the startup costs and lack of hauling options in some communities.

The Cedar Rapids/Linn County Solid Waste Agency is discussing a pilot project with the Cedar Rapids School District that would include 16 weeks of free hauling of food scraps for one school, agency spokesman Joe Horaney said.

“It’s an opportunity to educate and divert,” he said.

Forty percent of food in the United States goes uneaten, according to the National Institutes of Health.

Food makes up about 15% of Iowa landfill waste, or about 19,000 tons a year, according a 2011 state waste characterization study. The Iowa City Landfill has composted more than 300 tons of food since 2007 and wants to expand its program.

Compost pickup

Cedar Rapids is one of the only communities in the state to do curbside compost pick up. Residents may put food scraps in their green Yardy Carts along with yard waste, Horaney said.

School administrators trying to stretch budgets to pay for teachers, facilities, technology and other needs often don’t want to spend money on composting, Lane said.

Regina got a \$1,460 Solid Waste Alternatives Program grant from the Iowa Department of Natural Resources to pay for startup costs, including large bins, signs and biodegradable bags.

The school spent \$6,420 a year on trash pickups before the program, said Missy Aitchison, a parent who started the recycling and composting program in 2011. Composting has cut the number of trash pickups required so the cost of trash and compost hauling is now \$6,515 a year — just \$8 a month more than the previous costs, she said.

School rules

New federal guidelines requiring students to take at least one fruit or vegetable for school lunch are generating more waste, teachers and parents at several schools said. It’s common to see whole apples or bananas in garbage bins at Excelsior, Lane said. “They want the option to take just what they want to eat,” Lane said of his students.

The guidelines, which also add more whole grains and reduce sodium, are intended to improve children’s health. Ann Feilmann, the state Department of Education’s Nutrition and Health Services bureau chief, said there has always been waste with school lunch programs because short lunch periods and chatting don’t always allow kids to eat all their food.

Regina has a basket where students can put uneaten food, such as whole fruit or sealed bags of carrots. The food is donated to Table-to-Table, an Iowa City-based non-profit that picks up surplus food from schools, grocery stores and restaurants and takes it to area shelters and food banks.

Parent volunteers help Regina kindergartners and first-graders sort their plastics, paper and food after a recent lunch period. Leftover milk goes into a five-gallon bucket, plastics are pulled and leftover chicken potpie, green beans and fruit are dumped in a large bin with a biodegradable bag.

“It helps the earth a lot because if you throw away everything, it would take up too much space,” said Morgan Squiers, 7, of North Liberty.

LeMars Community School District (LeMars)

Food Waste System Snapshot:

- Source reduction

Offer vs. Service (OVS)⁸²

OVS, offer vs. service, is a concept that applies to menu planning and to the determination of reimbursable school meals. OVS allows students to decline some of the food offered in a school lunch or breakfast.

The goals of OVS are to reduce food waste in the school meals programs, and to permit students to select the foods they prefer.

To meet program requirements, each day students must be offered five food items from the four food components in at least the minimum serving sizes for the appropriate age/grade group.

Ottumwa Community Schools (Ottumwa) / Pella Community Schools (Pella) / West Liberty Community Schools (West Liberty)

Food Waste System Snapshot:

- Composting

School Districts Going Greener in Iowa⁸³

This semester is starting off a little more green for three Iowa school districts. Ottumwa Community Schools, Pella Community Schools and (most recently) West Liberty Community Schools have begun the semester by implementing GreenRU composting into their food services.

Both schools started the program at a couple of schools in the district. They are planning to expand so all schools in the district will be diverting their organics from the landfill.

“We’re getting used to it, it isn’t too hard,” said Cheryl Ferguson of Pella High School, as she sliced a pineapple and threw the stock and skin into a orange composting bucket at her feet.

Danny Renfrew, Director of Operations at Ottumwa Community Schools, has wanted to start a program like this for a while, so he is happy to finally have a company who can work with them.

“The kids who we’re doing this for, they’re the ones who inherit this planet,” said Renfrew. He continued that he did not want to leave this planet a mess for the children at the school to clean up when they are adults.

Bob Brisendine, Head Custodian at Douma Elementary School in Ottumwa, has been teaching the children there to separate the waste themselves. The Douma cafeteria now has two big containers marked “Food Waste.” Brisendine is impressed with how quickly the children are picking up food

⁸² LeMars Community School District: http://www.lemars.k12.ia.us/district_food_service.htm

⁸³ Celsias: <http://www.celsias.com/article/school-districts-going-greener-iowa/>

recycling. That day's waste had only one piece that did not belong in the food waste, which he separated before moving the food waste into the orange organics bin that now sits behind the school.

"It's a little extra work, but it's worth it," Brisendine said.

Both school districts are excited to expand the program to all of their schools. GreenRU and Chamness Technology, Inc. are teaming up to provide this service free of charge to the schools this year.

Already both schools are seeing the huge impact it could have on their waste. In the month of January Ottumwa and Pella School Districts diverted a cumulative total of 1,580 pounds.

South East Junior High (Iowa City) and West Branch Middle School (West Branch)

Food Waste System Snapshot:

- Composting

Group Promotes Composting Iowa City Schools' Waste⁸⁴

January 3, 2012 – Local students are working to divert food waste and start composting projects at their schools.

Students from South East Junior High and West Branch Middle School have formed the group Compost Happens. The group started this year with the mission of promoting food waste diversion and starting compost programs at schools around their districts.

"We started the project because it was a problem that needed to be solved to help the environment," said Max Otoadese, 13, a seventh-grader at South East.

By diverting food waste, compostable items are separated from other trash. This way, the food waste can become compost instead of ending up in the landfill.

The club is working to educate their peers and the administrators about the importance of diverting food waste and composting.

⁸⁴ District Administration: <http://www.districtadministration.com/news/group-promotes-composting-iowa-city-schools-waste>

Prairie Point Middle School and Ninth Grade Academy (Cedar Rapids)

Food Waste System Snapshot:

- Composting

GreenRU Helps Student's Compost Crusade: Ninth Grade Student Lilly Brown Wins the Cafeteria Food Waste Fight⁸⁵

April 17, 2012 – Lilly Brown is trying to change the world. At the young age of 15, she is environmentally-conscious beyond her years and has a long-term goal to help reduce society's dependence on landfills. Lilly determined that she could make a real difference at her school, Prairie Point Middle School and Ninth Grade Academy. She discovered that 65% of the total cafeteria waste could be diverted from the landfill and turned into compost. There was just one problem. Lilly wanted to compost the food waste, but had no way to do it as efforts to compost on-campus were not practical. GreenRU, an organic diversion company, learned of the situation and met with Lilly and Prairie Point's Principal, Greg Leytem. Today, GreenRU collects the organic food waste at no-charge through the end of the school year.

Lilly has showed her fellow students a more ecological way to deal with trash and food waste in the cafeteria. Students were educated on the options of putting food waste in one container and waste for the landfill in another. Students are responsible for the separation when they return their food trays to be cleaned. The program has met with tremendous success. Today, the collected waste goes to a state certified compost facility and the school is seeking a grant to continue food waste diversion for the entire College Community School District next year.

"I like helping the Earth and the environment and this is such an easy thing that just about everybody can do to help," Lilly said.

GreenRU, a Chamness Company, is the first company in Iowa to provide full composting services; including education, training, collection containers and services. The program is designed to work with industry, schools, colleges, grocery stores, hospitals, and institutions that are looking to better their environmental footprint and improve their sustainability efforts.

Over 34 million tons of food waste is thrown away by U.S. homes and businesses. Food waste is now the fastest growing waste stream sent to landfills. Organic materials, when re-purposed into compost, make a nutrient rich soil amendment and help reduce greenhouse gas emissions.

GreenRU's innovative pick-up system is unlike any other in the region. The specialized organics collection vehicle is specially designed to transport organic materials safely and efficiently to a certified compost facility. At the composting facility, organic waste is mixed with wood and other materials and processed over several months to create compost that can be used for a variety of agricultural and horticultural applications. All of the compost from Iowa clients goes right back to Iowa soils to enrich the next generation of crops. For more information, visit www.greenru.org.

⁸⁵ Chamness Technology Inc.: <http://chamnesstechnology.blogspot.com/2012/06/greenru-helps-students-compost-crusade.html>

Restaurants

Applebees

Food Waste System Snapshot:

- Recycles cooking oil

Oil Recycling Program⁸⁶

A number of their environmental programs focus on reducing waste generated by their operations. Applebees continues to look for ways to eliminate, reuse or recycle potential waste. One example is the regular recycling of used cooking oil at most of their restaurants.

Bluebird Diner⁸⁷

Food Waste System Snapshot:

- Composting

Jon Wilson and Thomas Connolly opened Bluebird Diner in the Northside Marketplace district of Iowa City in October, 2008. Bluebird boasts delicious homemade food with a bright and cheery modern style atmosphere. It provides customers with a unique experience in the restaurant's conscientious decision to implement food waste diversion and responsible dining. Whenever possible, food waste from Bluebird enters a compost pile, not a landfill.

Adding Food Waste

Wanting to do more than just recycle, the owners decided to tackle food waste. Connolly and Wilson applied for, and received a Solid Waste Alternatives Program grant from the Iowa Department of Natural Resources in 2011. The grant provided funds to reconfigure the dump station to allow the addition of food waste collection. It also helped them purchase bins, signage and containers. In addition to the SWAP grant, they also received an easement from the city to allow for an outdoor collection and pick-up center for the food waste. A private hauling company picks up the food waste twice per week and takes it to the Iowa City Landfill and Recycling Center where it is matured into compost.

The challenges of implementing and maintaining the food waste diversion project for Bluebird Diner have been few. Straws and jam packets in the food waste need to be sorted out or contamination will be an issue. Presently, Connolly and Wilson have not found an affordable, compostable straw that can be safely added to the food waste and jam packets are not compostable but are essential to the diner's breakfast menu. Also, ongoing training for new staff is imperative to the success of the diner's diversion project. These are the only major challenges that face the diner in their project to reduce materials going to the landfill.

⁸⁶ Applebees: <http://www.applebees.com/about-us/responsibility>

⁸⁷ Iowa Food Waste Reduction Center: <http://www.iwrc.org/index.cfm/linkservid/C420D94B-A023-A622-FD683EA70E740B19/showMeta/0/>

Positive Image

For Bluebird, this program is basically a financial wash but the public relations benefits are far reaching. Throughout the Iowa City community, Bluebird is considered to be a responsible option in dining that has a positive sustainable image. This is due to the fact that Bluebird sends 800 pounds of material per week to a compost facility and recycles cardboard and plastics as well. Customers feel good about eating at Bluebird knowing the owners are going above and beyond to maintain an environmentally-friendly business. And at the end of the day, the food waste is being diverted from the landfill to be reused as compost.

Neighborhood Food Waste Collection

The owners of Bluebird Diner would like to see more restaurants in the Northside Marketplace divert food waste from landfills. It is Connolly's wish that a common area for the collection of food waste be established for the neighborhood restaurants. With space being an issue, a common collection area could help alleviate some of the difficulties restaurants face in implementing a food waste diversion program. Either way, Bluebird Diner is a great example of a successful and sustainable restaurant business in Iowa.

Darden Restaurants⁸⁸

Food Waste System Snapshot:

- Recycles cooking oil
- Donation
- Composting

Their brands include: Red Lobster, Olive Garden, LongHorn Steakhouse, Bahama Breeze, Seasons 52, The Capital Grille, Eddie V's, and Yard House.

Approach

Darden has an ambitious waste reduction goal of one day sending zero waste to the landfill.

Highlights

- Diverted more than 140,000 cubic yards of waste from landfills and recycled in FY 2011.
- Recycling efforts per year save approximately 930,000 trees, 500 million gallons of water and over 300 million kilowatt-hours of electricity.
- Recycle 100% of discarded fry oil and used for biodiesel, animal food and as an ingredient in soaps.
- Donated nearly 10 million pounds of food in FY 2011 through our Darden Harvest program.

Composting

Least common of all recycling is the availability of composting, a key issue for Darden given that food waste is the largest single component of their waste stream making up more than one-third of their

⁸⁸ Darden Restaurants: <http://www.darden.com/sustainability/default.aspx?lang=en&page=planet§ion=waste-reduction>

total waste, by weight. Darden will launch pilot composting programs in a select number of markets in FY 2013, with the goal of better understanding what the technical and behavioral challenges to composting are and how they can overcome them.

Food Waste

The Darden Harvest program distributes high quality, prepared foods to hunger relief organizations. In FY 2012, Darden officially surpassed 56 million pounds of food donated since the program began in 2004. Darden also supports the Food Waste Coalition, an initiative launched by the Grocery Manufacturers Association, National Restaurant Association and the Food Marketing Institute aimed at reducing food waste.

Darden has also worked diligently to develop recycling efforts for cooking oil. Since November 2010, Darden has recycled 7,312,446 pounds of cooking oil.

Her Soup Kitchen⁸⁹

Food Waste System Snapshot:

- Composting

The shining star of local Iowa City restaurants undergoing a sustainable transformation may be that of Her Soup Kitchen, 625 S. Dubuque St., owned and operated by Barb Farnsworth. Since their opening over a year ago, Her Soup Kitchen stresses the importance of composting, reuse, recycling, and buying locally.

“We reused bricks from a demolished building for our patio, tables and chairs that customers have brought us, coffee mugs, plates, we’ve bought cooking appliances from auctions, almost everything here has been reused,” said Jason Farnsworth, son of Barb Farnsworth and head chef of Her Soup Kitchen.

“We compost everything we can. We’ve had more vegetables grow out of our compost this year than our own garden.”

For Barb Farnsworth, bragging about how the restaurant produces only one bag of trash a day is not something she is interested in. “I want the community to see us as environmentally conscious, sure, but the main reason we run our restaurant this way is because we believe in nourishing the neighborhood,” Farnsworth said.

Her willingness to prove that a business can significantly reduce its waste with little effort might make Her Soup Kitchen the most sustainable restaurant in Iowa City. Their ability to thrive on reuse has set an example, not just for other businesses in the area, but for patrons as well.

“Sustainability is just as much as a social practice as an environmental one,” said Farnsworth.

When asked if she thought her business has flourished in part because of her connection with the community in advocating sustainability, she said, “Absolutely. It’s something we’re very willing to teach people about.”

So what is the best advice for restaurants that are looking to better the environment and their community?

⁸⁹ Iowa City Tales: <http://iowacitytales.wordpress.com/2010/12/12/iowa-city-businesses-make-moves-towards-sustainability/>

It's important for businesses to understand that they do not necessarily become sustainable, they work toward sustainability in a process of continuous improvement, said Sheila Samuelson, a Sustainable Business Consultant for Bright Green Strategy of Iowa City, Iowa. "Sustainability is something that every type of business has an opportunity to work towards."

MidWest Renewable Biofuels, Inc.⁹⁰

Food Waste System Snapshot:

- Recycles cooking oil

Midwest Renewable Biofuels is a collector and recycler of waste oils into Biodiesel and other side stream products. When businesses and organizations recycle their waste vegetable oil with them they are considered a partner in sustainability.

Their Partners in Sustainability include:

- Altoona
 - Big Steer Restaurant
 - Fireside Grill
 - Uncle Buck's
- Ames
 - McDonald's
- Ankeny
 - Croz Nest
- Des Moines
 - China One International
 - Down Under Bar & Grill
 - Mr. Eggroll Chinese Fast Food
- Decorah
 - McDonald's
- Indianola
 - Garden Buffet
- Knoxville
 - Dairy Queen
 - Tasos Steakhouse
- Oskaloosa
 - Hot Shotz Bar & Grill
 - Riverside Restaurant #1
 - Riverside Restaurant #2
- Ottumwa
 - The Legend
 - McDonald's
 - Roe's Restaurant & Bar
- Pella
 - Dairy Queen
 - George's Pizza
 - Monarch's Restaurant
 - Windmill Cafe
- Pleasant Hill
 - Great Caterers of Iowa - Rib Shack
- Pleasantville
 - Back in the Day
- Polk City
 - Latitude 41 Bar and Grill
- Sioux City
 - McDonald's
- Walcott
 - Iowa 80 Kitchen

⁹⁰ MidWest Renewable Biofuels, Inc.: http://www.mid-iowa-renewables.com/new_partners.html

Panera Bread

Food Waste System Snapshot:

- Donation

Day-End Dough-Nation⁹¹

At the end of each day, Panera Bread donates all unsold bread and baked goods to local area hunger relief agencies and charities as part of its local Day-End Dough-Nation program. Collectively, Panera bakery-cafes donated a retail value of approximately \$100 million worth of unsold bread and baked goods in 2010 to help neighbors in need. Many of these organizations are served by Feeding America, formerly America's Second Harvest, the nation's largest domestic hunger-relief organization.

The Red Avocado (Iowa City)⁹²

Food Waste System Snapshot:

- Composting

December 12, 2010 – Deciding to make this shift in business strategy is not just about production and profits; it's also about meeting customer demands. And David Burt, the owner of The Red Avocado, 521 E. Washington St, Iowa City, knows that customers want tasty, nutritional, well-prepared food that doesn't come at the sacrifice of the world around them.

Their 100% organic vegan menu is why customers come to the Red Avocado.

"They come here because they understand that we are the only Iowa City restaurant that is 100% organic, and we have literally zero food waste," said Burt. "The Red Avocado composts every item of food that is left over, from our kitchen and our customers." The compost is then given away to various members in the community, from goat farmers to gardeners.

⁹¹ Panera Bread: <http://www.panerabread.com/about/community/>

⁹² Iowa City Tales: <http://iowacitytales.wordpress.com/2010/12/12/iowa-city-businesses-make-moves-towards-sustainability/>

Retirement Communities

SMS was unable to find mention of any food waste management systems at retirement communities in Iowa.

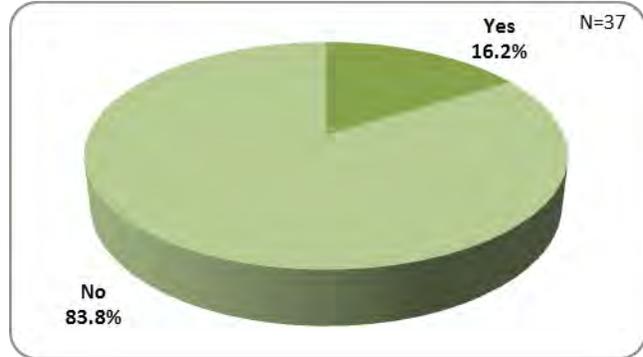


Primary Research Results

Landfills

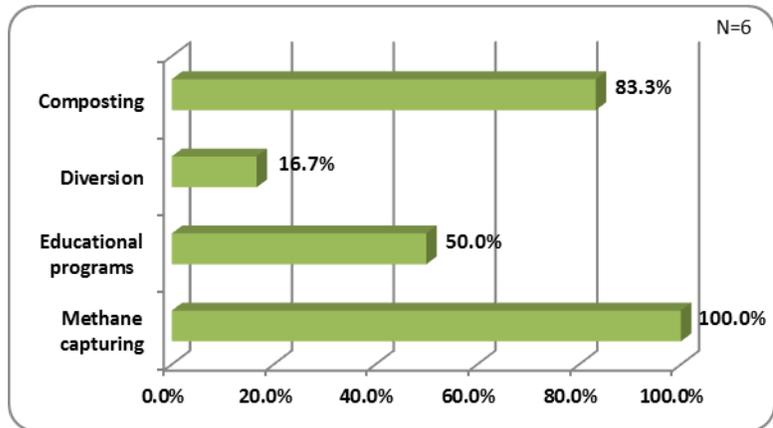
1. Do you have a food waste management system?

- The majority of respondents (31 respondents or roughly 84%), did not have a food waste management.
- The remaining six respondents (approximately 16%) had a food waste management system.



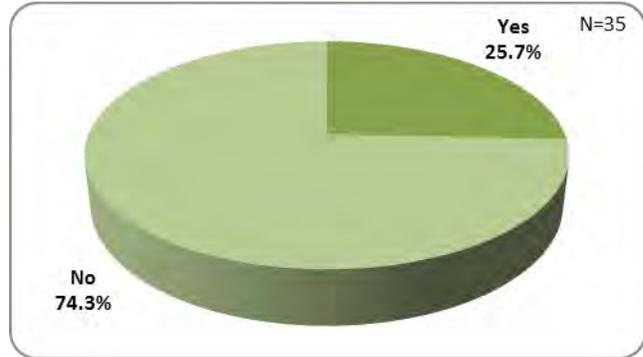
1a. [If yes] What reduction and/or diversion techniques are included in your food waste management system?

- All six respondents captured their methane gas, and five respondents (about 84%) composted.
- Half of the respondent group reported they had some sort of educational program(s).



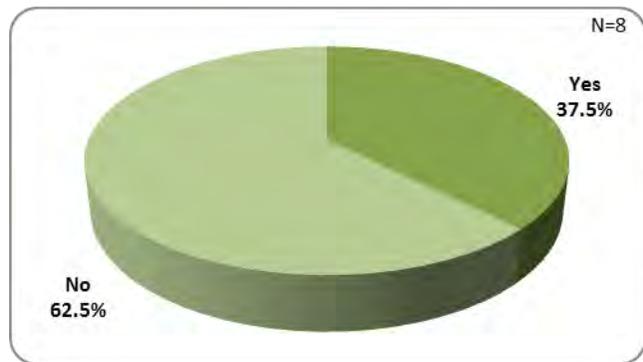
2. Do you capture your methane gas?

- The majority of the respondent group (26 respondents or about 74%), did not capture their methane gas.
- Only nine respondents (approximately 26%) captured their methane gas.



2a. [If yes] Is it used to generate electricity?

- Five respondents (about 63%) did not use their methane gas to generate electricity.
- The remaining three respondents (roughly 38%) did use their methane gas to generate electricity.



[If Q1 is yes]

3. Why did you choose to implement a food waste management system?

Good for the environment (4)

- 25% of landfills are food waste in Iowa; it's a waste of nutrients.
- Wanted to reduce the amount of methane released into the environment.
- Climate change.
- Taking useful organics out of the landfill.

Reduce food waste (2)

Other (2)

- High demand from public to do something about food waste.
- Alternative to landfilling.

4. Please describe your food waste management system.

Composting (6)

- All 14 schools in the area compost; built a new facility for composting using anaerobic digestion; private haulers are utilized for large generators; public can combine yard and food waste to be composted.
- Collect only organic food waste in curbside pick-up.
- Composting at landfill.
- Pilot program for commercial food scraps recycling.
- Pre-consumer food waste composting.
- Residents can put their food waste with their yard waste at the curb, but they can't include meat and dairy because of odor.

Diversion (4)

- \$20 coupons for public to use at local retailers to buy a compost bin.
- Outreach to local grocery stores and restaurants.
- Outreach to public to reduce waste at home.
- Sell compost bins.

Educational programs (2)

- Educational programs about residential backyard composting.
- School educational programs.

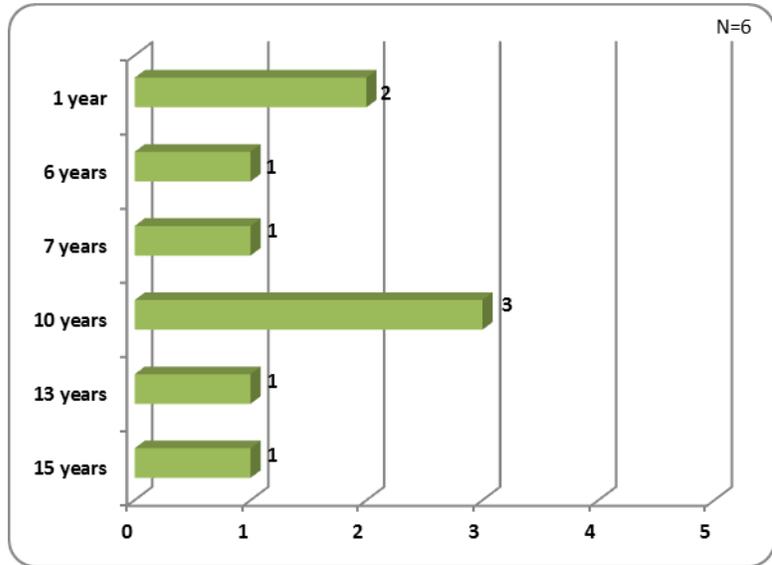
Other (1)

- Local student granted money to do waste reduction research.

5. How long have you used the system?

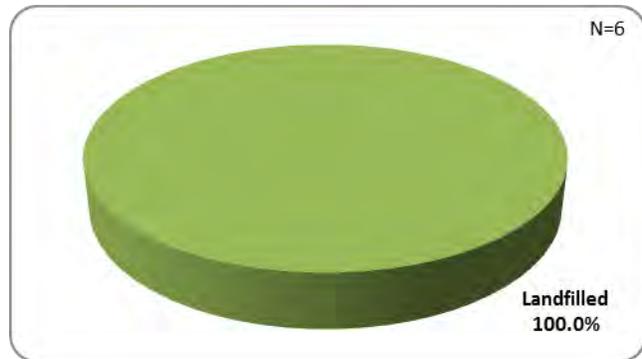
Please note: In some cases, the food waste reduction techniques that made up a respondents' food waste management system were implemented at different times; therefore, if you add up the frequency with which all of the categories were reported, they will equal more than the N size.

- The mean length of time that food waste reduction/diversion techniques had been in place was 8.11 years.
- Five reduction/diversion techniques had been in place for 10 or more years, while four techniques had been in place for less than eight years.



5a. What did you do with your food waste before this system was put in place?

- The entire respondent group landfilled their food waste prior to implementing their system.

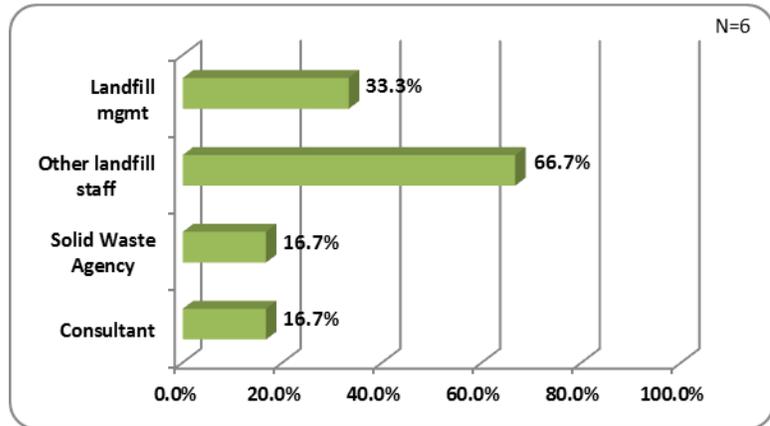


6. Who within your organization helped you put your system together?

- Four respondents (about 67%) worked with members of their landfill’s staff when implementing their system. Titles reported in this category include:

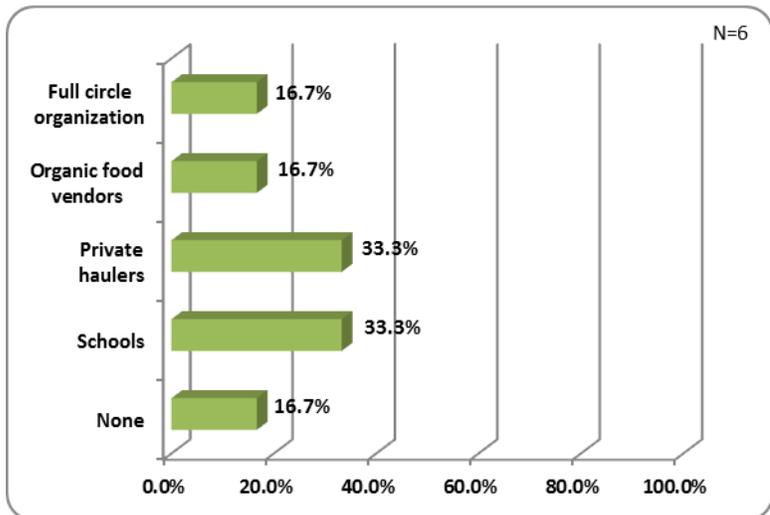
- Communications staff.
- Facility planner.
- Landfill engineer.
- Operations manager.
- Public affairs manager.
- Recycling coordinator.

- Two respondents (roughly 33%) worked with members of their landfill’s management team when implementing their system.



7. Who outside your organization helped you put your system together?

- The most frequently reported organizations were private haulers and schools within the landfill’s service area, with two respondents (about 33%) who reported each of those organizations.



8. What obstacles did you have to overcome? How did you address those obstacles?

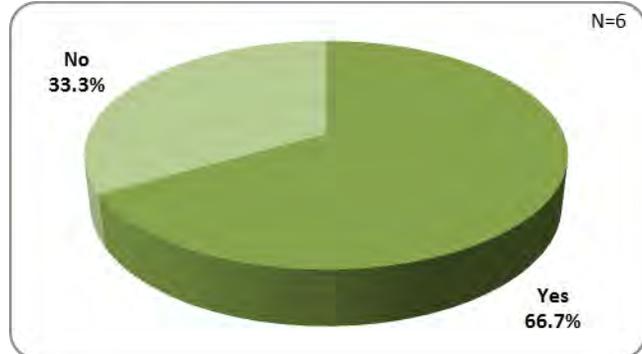
Obstacle	How did you address the obstacle?
Collecting the rain water and not letting it run off and contaminate.	Collect water under the compost in a pond.
1) Cost; 2) State; 3) DNR.	Reduced the "yuck" factor.
Getting organizations to realize that food waste is a problem.	Outreach.
Time for internal staff.	1) Added staff. 2) Worked with haulers and area continually improving relationships with them.
Public education.	Made people more aware of how they can reduce food waste.

Other obstacles reported by respondents include:

- Transportation. (2)
- Couldn't pick "favorites" with haulers, had to open it up to everyone.
- Did not have any obstacles.
- Long permitting process (14 months).

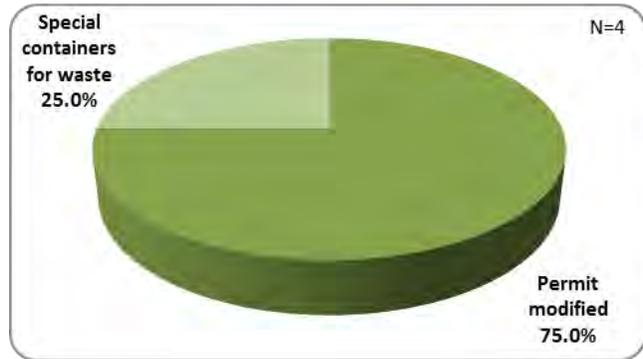
9. Were there any rules or regulations you had to follow when implementing your food waste management system?

- Four respondents (about 67%) reported they had rules/regulations they had to follow when implementing their food waste management system.
- The remaining two respondents (roughly 33%) did not have rules/regulations they had to follow.



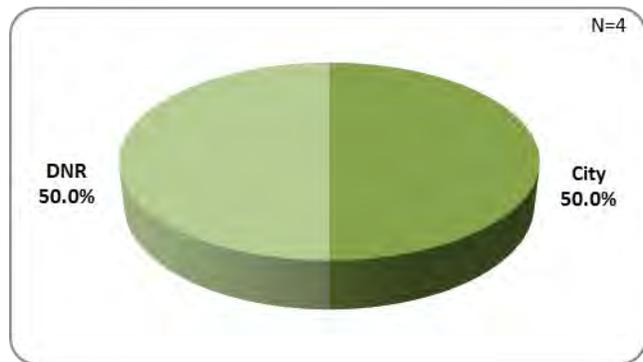
9a. [If yes] Please explain the type of rules/regulations.

- Three out of the four respondents (75%) had to get their permit modified, and one respondent (25%) had to get special containers for the waste.



9b. [If yes] Who was the governing body of those rules/regulations?

- Two respondents (50%) reported the DNR was the governing body of the rules/regulations, and two respondents (50%) reported the City was the governing body.



10. What other systems/approaches did you consider? What are the pros and cons of the alternative systems?

- Four respondents hadn't considered any other systems.

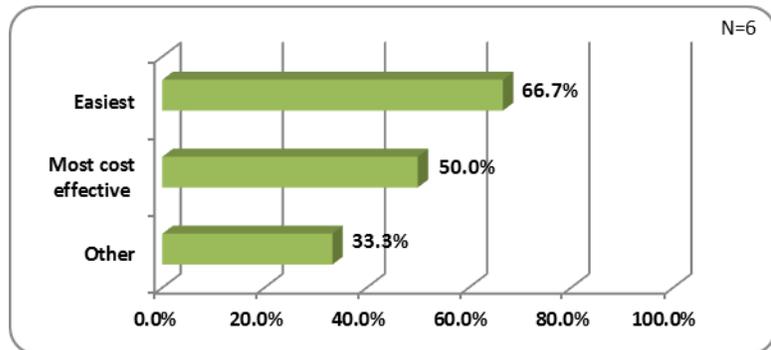
System	Pros	Cons
More advanced technologies like covered piles that are in a controlled environment and anaerobic digestion.	More effective and environmentally friendly.	Too expensive.
Couldn't do a lot with the cap on food waste, but implemented a lot more when the cap was lifted.	None.	It's better without the cap.

11. Are there any other systems or approaches that you didn't consider initially, but you may in the future? What are the pros and cons of those systems?

System	Pros	Cons
1) Wet and dry collections; 2) Anaerobic digestion.	Very effective.	Not given.
Different types of composting, such as in vessel.	Can compost year-round.	Cost.
Finding use for methane gas.	Not wasting methane gas.	Not given.
More advanced technologies.	Not given.	Cost.
Pilot program for full-fledge organic composting.	Not given.	Cost.
University fellowship is studying the consumer base and local food systems.	Not given.	Not given.

12. What are the main reasons you settled on the system you are using?

- The most frequently reported reasons were because the system was the easiest (reported by four respondents or about 67%) and the most cost effective (reported by three respondents or 50%).
- Other responses include:
 - It was what consumers wanted.
 - Wanted to reduce waste.



13. What are the strengths of your system?

Cost effective (2)

- Break-even for businesses to haul.
- No cost.

Easy of use (2)

- Facility is already set-up to hand a lot of volume.
- Fool proof from operations standpoint.

Other (3)

- Mature system.
- There aren't odor or varmint problems.
- Utilizing resources.

14. What are the weaknesses of your system?

Climate issues (3)

- Climate impact issues. (2)
- Exposure to air, odor.

Lack of resources (2)

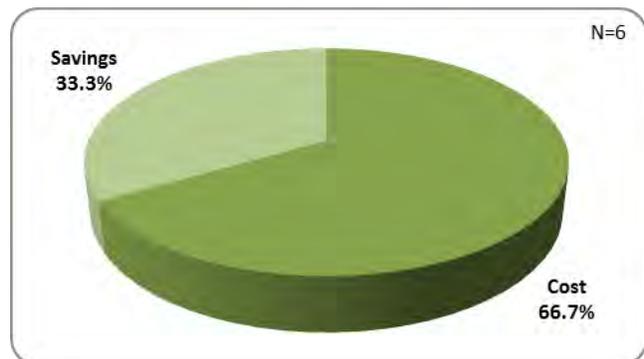
- Lack of city staff time for outreach.
- Public knowledge.

Other (2)

- It's voluntary and not mandatory.
- Not as effective.

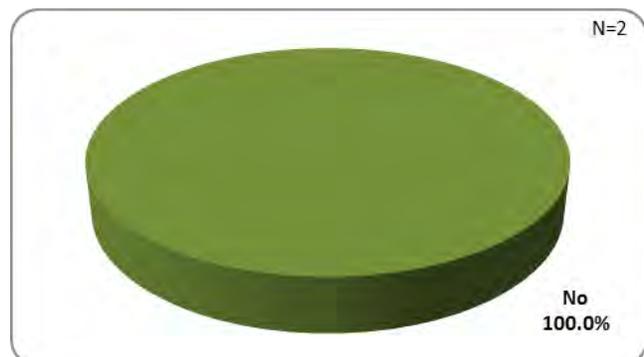
15. Is your food waste management system a net cost or a net savings to your organization?

- Four respondents (about 67%) reported their system was a net cost to their landfill, while the remaining two respondents (roughly 33%) reported their system was a net savings.



15a. [If savings] Can you put a dollar figure to that?

- Neither of the respondents could associate a dollar figure with the net savings.



15b. [If savings] Where does the savings occur?

Landfill savings (2)

- The long-term landfill savings occurs when you don't have to build more landfill cells, which is very costly.
- Save on disposal costs.

Environmental savings (1)

- Saving the environment.

16. What are your future plans for your system?

Utilize more advanced technologies (4)

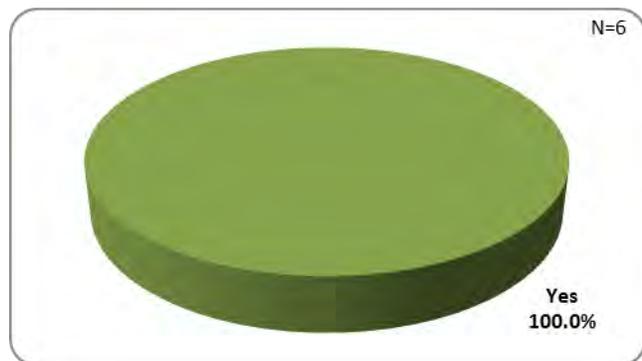
- In-vessel composting.
- Single stream recycling.
- Wet/dry collection systems.

Other (5)

- Mandate for public and private sectors.
- Pilot program for full-fledged composting.
- Site planning overall to increase efficiency and flow.
- Target larger organizations to recycle their food waste.
- Utilize methane gas.

17. If you had to do it all over again, would you?

- All six respondents would do it all over again.



17a. [If yes] Why?

Reduce food waste (3)

It's effective (2)

- Effective in changing the social culture and the best use of the materials; thinking sustainability and environmental impact.
- Very successful over time, once it got momentum it took off quickly. Businesses realized that even if it is costly at first it is the right thing to do environmentally.

Other (1)

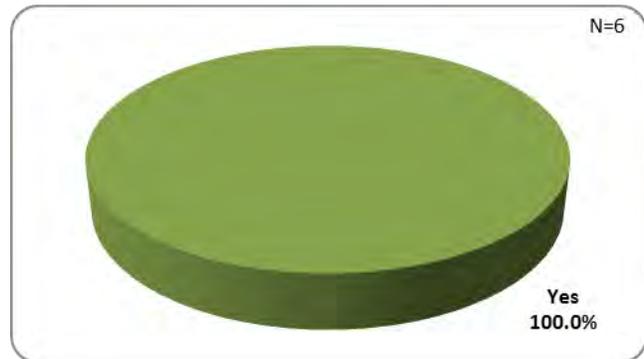
- We're just getting started.

17b. [If no] Why not?

Not applicable.

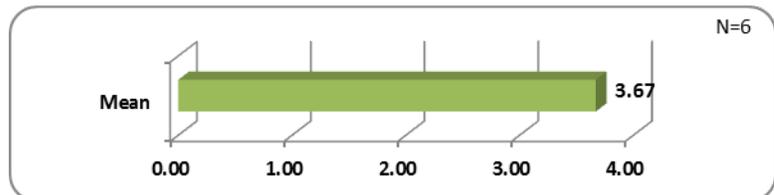
18. Would you recommend this system to your peers?

- All six respondents would recommend their food waste management system to their peers.



19. On a scale of 0 to 4 with 0 being not at all satisfied and 4 being very satisfied, how satisfied are you with your system overall?

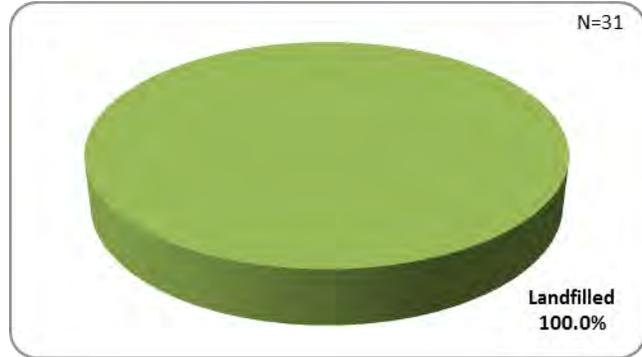
- Respondents were highly satisfied with their food waste management system, as shown by a mean of 3.67.



[If Q1 is no]

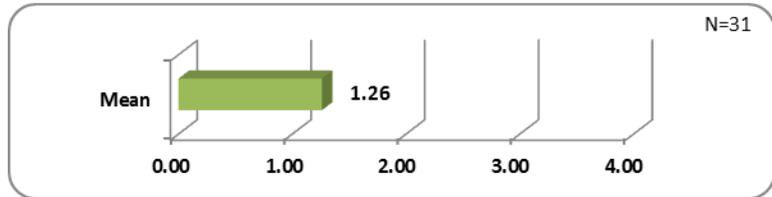
3. What does your organization currently do with your food waste?

- The entire respondent group landfilled their food waste.



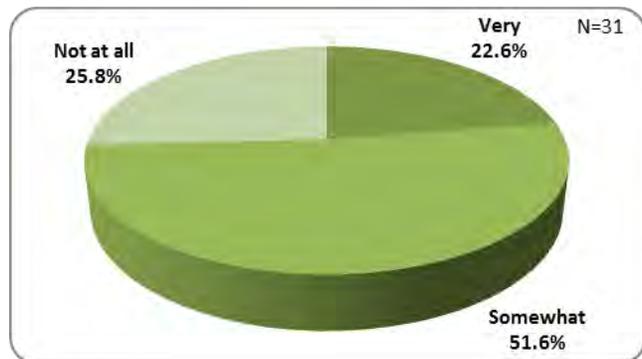
4. On a scale of 0 to 4 with 0 being not at all significant and 4 being very significant, how significant do you think the food waste problem is for your organization?

- In general, respondents did not feel that food waste was a significant problem for their landfill, as shown by a mean of 1.26.



5. Would you say you are very familiar, somewhat familiar, or not at all familiar with food waste management systems or techniques?

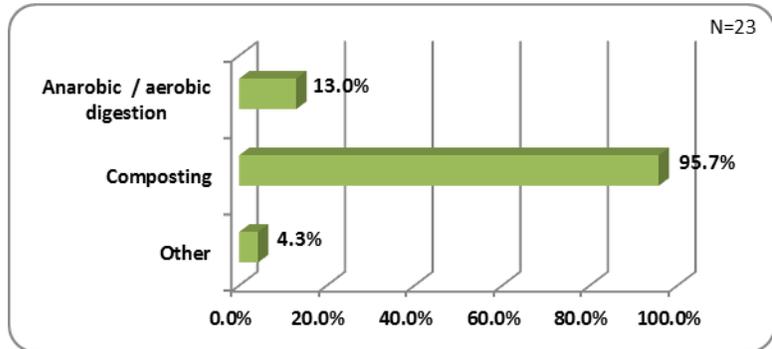
- Twenty-three respondents (about 74%) were very or somewhat familiar with food waste management systems or techniques.
- The remaining eight respondents (approximately 26%) were not at all familiar with food waste management systems or techniques.



[If very or somewhat familiar]

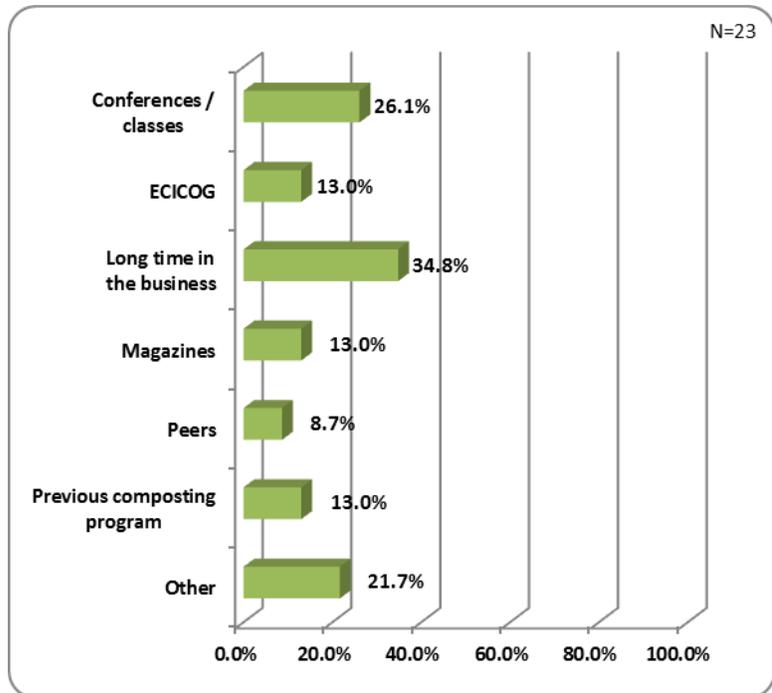
6. What systems are you familiar with?

- Nearly the entire respondent group (22 respondents or roughly 96%) was familiar with composting.
- Three respondents (13%) were familiar with anaerobic/aerobic digestion.
- Other responses include:
 - John Deere has been using biodegradable cups and plates.



7. How did you learn about them?

- Eight respondents (roughly 35%) knew about food waste management systems because they had been in the business for a long time.
- Six respondents (about 26%) learned about food waste management systems/techniques by attending conferences or classes.
- Other responses include:
 - DNR.
 - Farming.
 - Internet.
 - National trade organizations.
 - Research.



8. What do you like about them?

Yields a useful product (5)

- Composting can yield a useful product if used on a "recipe" basis; have to control the inputs to generate useful material.
- Composting like organic breakdown does work. There is potential for on-site management by large food processors.
- Good way to handle waste and turn into usable product.
- Like the concept of composting.
- Mixing with organics seems like a viable option.

Good for the environment (5)

Nothing (5)

Reduce food waste (3)

Other (5)

- Everything.
- Good opportunity.
- More public knowledge about food waste reduction.
- No feeling one way or the other.
- Very effective, used to service all the HyVee's in Iowa.

8a. What do you dislike about them?

Cost (9)

- Cost prohibitive. (6)
- Cost of transportation.
- Have low landfill fees, so people don't really want to reduce food waste if it will raise fees.
- Very expensive to fix a broken composter.

Composting issues (5)

- Odor. (4)
- If composting isn't implemented correctly, odor and varmints can become an issue. Have to plan well.

Lack of resources (5)

- Don't have the man power.
- Limited resources.
- Requires extra space.
- Takes time.
- Very extensive process.

Don't have enough food waste (4)

- Too small to generate enough food waste to be effective. (3)
- Need enough food waste to do it.

Collection issues (2)

- No collection program is workable on a local level, mostly because of Iowa weather, in the summer collection is too hard because of heat and too hard in winter because of freezing temps.

Lack of public knowledge (2)

- Hard to convince people to take advantage of the opportunity to reduce food waste.

Other (5)

- No feeling one way or the other. (2)
- Approaches are temperamental.
- DNR regulations are burdensome.
- Not sure food waste reduction programs even reduce our carbon footprint.

9. What obstacles would you have to overcome to implement a system?

Cost (13)

- Cost. (9)
 - Transportation costs.
- Financing. (3)
- Potentially higher fees.

Collection/Transportation (7)

- Collection. (3)
 - Rural area problem/economics of collection.
- Transportation. (3)
- Delivery.

Community/Leadership buy-in (6)

- Lack of public interest/public perception. (4)
 - People in area had bad experience with a compost site. It made the area the smell really bad and people got sick.
- Getting the Board of Directors to agree.
- Have to partner with small restaurants (only food waste producers on large scale in town).

Space/Location (6)

- Siting, location. (2)

Composting issues (5)

- Have to have the right mix of inorganic and organic materials in the screening process. (3)
- Market for end product.
- Odor.

Lack of resources (4)

- Don't have man power or managing resources. (2)
- No capabilities being so small.
- Personnel resources.

Rules/Regulations (2)

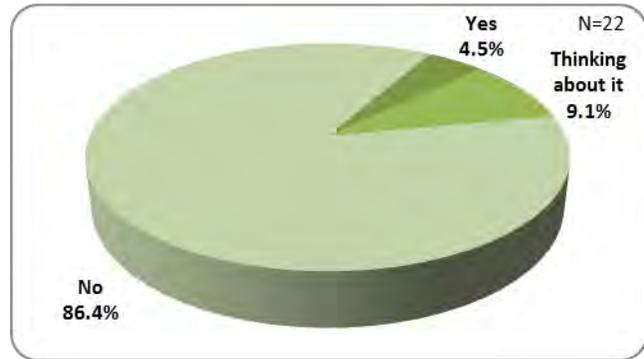
- DNR regulations.
- Would have to get a license.

Other (4)

- Changing infrastructure for food waste generators.
- Figuring out how and when.
- Need more food waste.
- Separating waste.

10. Do you have any future plans to implement a system?

- The majority of the respondent group (19 respondents or about 86%) did not have future plans to implement a system.
- Only one respondent (roughly 5%) had future plans to implement a system, while two respondents (approximately 9%) were thinking about it, but had no definite plans. The responses from the respondents who were thinking about it are below.



- Have talked about adding food waste to yard waste to compost for years, but no future plans. We would need to partner with a company for collection services.
- The issue is on the front burner. [City name] has a new Walmart Super Center and Fareway Distribution Center that like to compost. The problem is that the waste from them isn't always the same from month to month.

[If yes]

11. What systems are you considering and why?

- The one respondent who had plans to implement a system was planning on getting an organic composting permit.

12. How soon do you plan to implement your system?

- Within the next two years.

13. What information would you need to collect to make a decision?

- Look at a third parties' success at food waste management, such as ISU's composting system. Ames also has a program for turning residential waste into energy. Would also need to talk to a private company to help with transportation (i.e., picking up waste from a restaurant to compost).

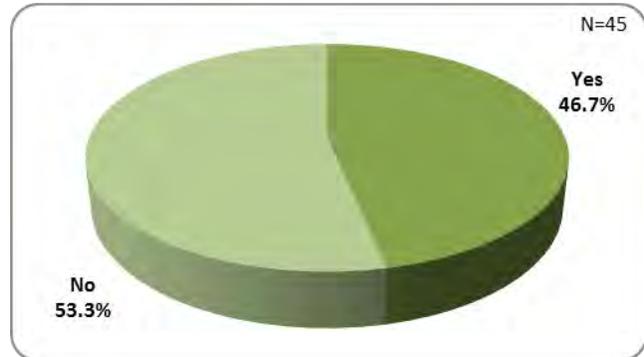
14. What type of help would you need? Where would you go to get help?

- Collecting and aggregating the material. Would look to the parties mentioned in Q13 for help.

Large Food Users

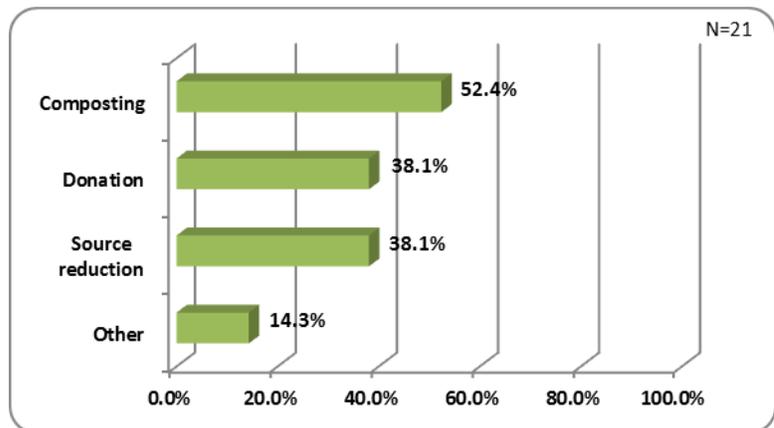
1. Do you have a food waste management system?

- The respondent group was nearly split in half, with 21 respondents (about 47%) who had a food waste management system, and 24 respondents (roughly 53%) who did not.



1a. [If yes] What reduction and/or diversion techniques are included in your food waste management system?

- Slightly over half of the respondent group (11 respondents) composted.
- Donation and source reduction were the second most common reduction/diversion techniques, with eight respondents (roughly 38%) who reported using each of the techniques.
- Other responses include:
 - Trayless dining. (2)
 - Feed for the animals on the farm.



2. Do you capture your methane gas?

Question does not apply to large food users.

2a. [If yes] Is it used to generate electricity?

Question does not apply to large food users.

[If Q1 is yes]

3. Why did you choose to implement a food waste management system?

Reduce food waste (12)

- Recycle pre-consumer waste.
- Reducing amount of material that is going to the landfill; want to divert 60% of waste by 2020.

Cut costs (9)

- Reduce disposal costs. (3)
- Reduce food costs. (3)
- Be more efficient and not waste money.
- Corporate benefit (tax deductions).
- Cut production costs.

Corporate initiative (2)

- Corporate office decided to.
- Corporate told them to implement this system.

The right thing to do (2)

- Goes along with what [company] is about doing, the right thing to do.
- To help people out; it's the right thing to do.

Other (4)

- Beneficial for horticulture department.
- Built a new student center and saw the opportunity to add food waste reduction at the new site.
- Conscientious about the environment.
- Philosophy and way of life on a farm.

4. Please describe your food waste management system.

Composting (11)

- Compost with third party vendor. (5)
- Compost in the culinary department.
- Compost pre-consumer waste.
- Fully compostable graduation picnic, and haul food and degradable plates and silverware out to a bigger composter.
- On-campus composting.
- Pilot program, off-site composting at high school and one elementary.
- Student-led organization that has a small scale composting operation, 6 locations on and off campus.

Donation (10)

- Donate to food bank/Salvation Army/shelters. (7)
- Donate all the food that they can to food banks, not damaged product. Even donate dog and cat food to humane societies.
- Donate to student organization that gives food to church groups.
- Left over money in food expense account they donate to local business.

Source reduction (9)

- Kitchen staff documents food waste. (4)
- Switched to room service so now patients only get the amount of food they need and what they want to eat. (2)
- All kitchen staff weigh waste before it is thrown away and record the reason of disposing, put in clear bins to make staff more aware of waste, weekly reports produced and production and purchasing changes made as necessary.
- Better production in food services, source reduction.
- Software that analyzes food waste to make for more efficient production.

Trayless dining (3)

Use pulper (3)

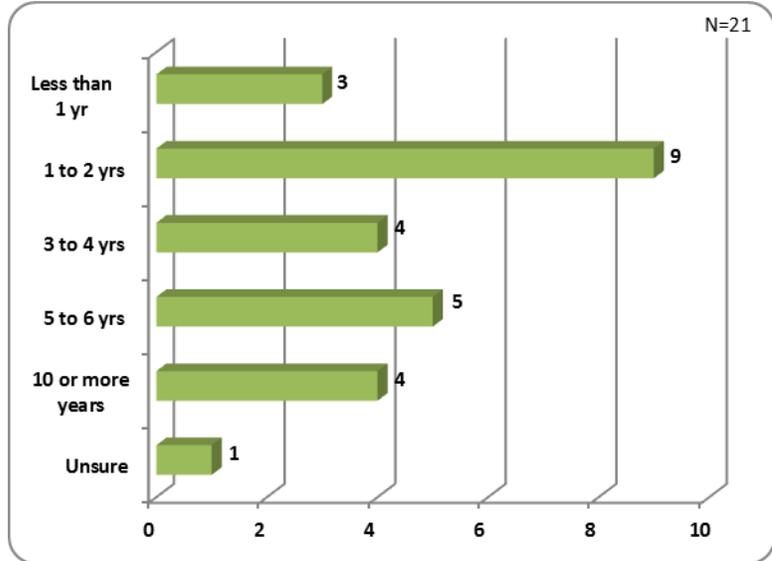
Other (2)

- All food waste goes to the cats, dogs, and chickens on the farm.
- Any waste in the kitchen, bakery and produce is recycled in some way.

5. How long have you used the system?

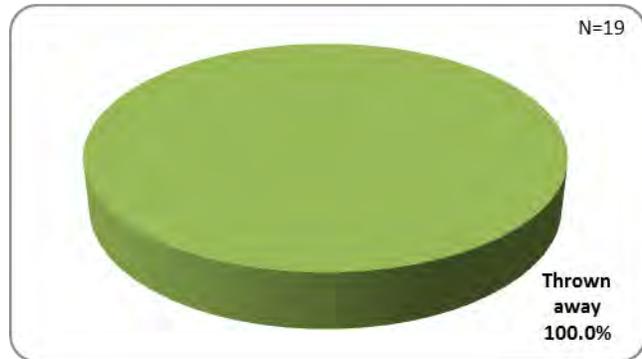
Please note: In some cases, the food waste reduction techniques that made up a respondents' food waste management system were implemented at different times; therefore, if you add up the frequency with which all of the categories were reported, they will equal more than the N size.

- The mean length of time that food waste reduction/diversion techniques had been in place was 5.26 years.
- Four reduction/diversion techniques had been in place for 10 or more years, while 21 techniques had been in place for less than seven years.



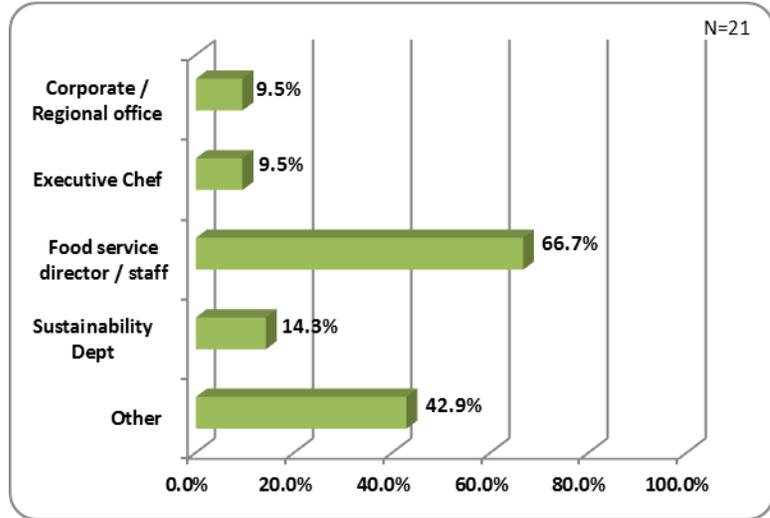
5a. What did you do with your food waste before this system was put in place?

- The entire respondent group threw away their food waste prior to implementing their system.



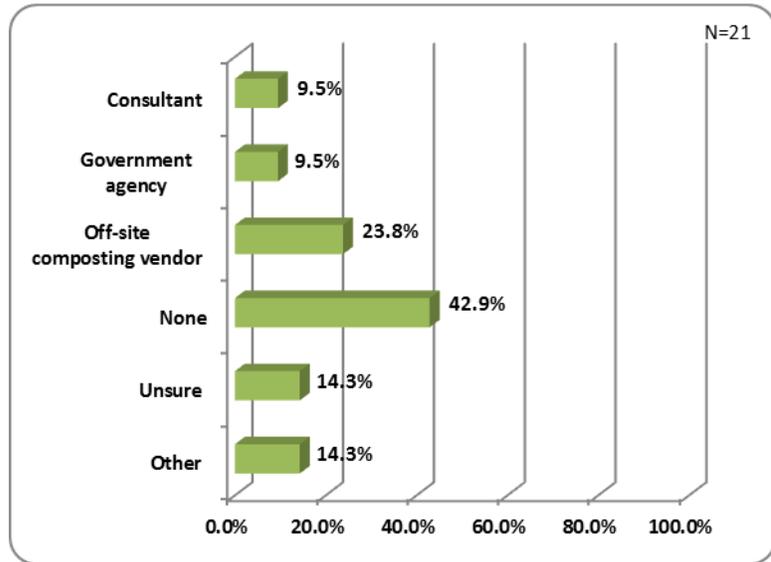
6. Who within your organization helped you put your system together?

- Fourteen respondents (about 67%) worked with their food service director and/or food service staff when implementing their system, while three respondents (roughly 14%) worked with their sustainability department when implementing their system.
- Other responses include:
 - Area managers.
 - Campus ministry.
 - Dietician.
 - Food bank.
 - Grounds services.
 - None.
 - Operations.
 - Owner.
 - Salvation army.
 - Student organization.
 - Unsure.



7. Who outside your organization helped you put your system together?

- Nine respondents (approximately 43%) did not use an outside organization when putting their system together.
- The most frequently reported organization was an off-site composting vendor with five respondents (about 24%) who reported this organization type.
- Other responses include:
 - Food bank.
 - Peers.
 - Shelter.



8. What obstacles did you have to overcome? How did you address those obstacles?

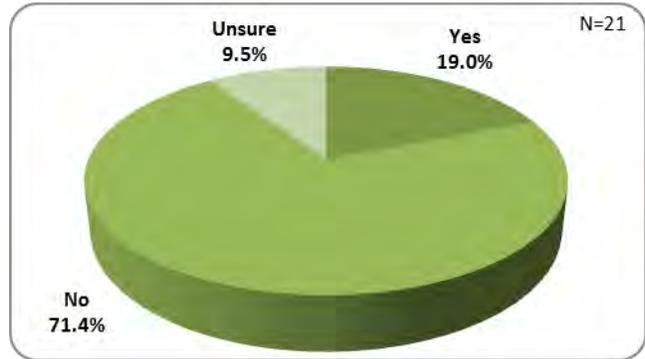
Obstacle	How did you address the obstacle?
Time for internal staff. (6)	<ul style="list-style-type: none"> • Production sheet made prep easier in the long run. (2) • The staff learned pretty fast. (2) • Haven't overcome this obstacle yet. • It didn't take the staff long to get used to recording the food waste.
Transportation. (3)	<ul style="list-style-type: none"> • Got more people involved in donating to lower transportation costs. • Got the logistics ironed out. • Off-site vendor now gives the kitchen 30 gallon bins on rollers for compost pick up.
Land for compost and perceptions about composting.	Started small so they could show success.
Leadership in food service department.	Staff took it on easily and seemed like they wanted to help reduce food waste.
Liability.	Built in safe-guards for liability.
Too costly to have pulpers in both dining halls.	Reconstructed the dining halls to make just one and could now afford a pulper.
Using the end product from the pulper.	Haven't overcome this obstacle yet.

Other obstacles reported by respondents include:

- No obstacles. (4)
- Unsure. (3)

9. Were there any rules or regulations you had to follow when implementing your food waste management system?

- Fifteen respondents (roughly 71%) did not have to follow rules/regulations when implementing their food waste management system, while four respondents (19%) did have rules/regulations they had to follow when implementing their system.



9a. [If yes] Please explain the type of rules/regulations.

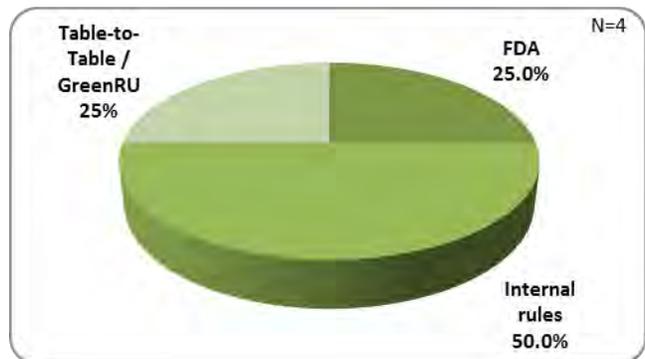
Pay attention to expiration dates (2)

Other (4)

- Can't store food waste inside.
- Have to wear gloves.
- No crushed cans.
- Table-to-table and GreenRU have rules about what can/can't be donated and what can/can't be composted.

9b. [If yes] Who was the governing body of those rules/regulations?

- Two respondents (50%) reported their organization had internal rules they had to follow.
- Table-to-Table/GreenRU and the FDA were also reported as governing bodies by respondents, with one respondent (25%) reporting each organization.



10. What other systems/approaches did you consider? What were the pros and cons of the alternative systems?

- Twelve respondents hadn't considered any other systems, and an additional three respondents were unsure if they had considered any other systems.

System	Pros	Cons
Additional composting.	Will keep small in the beginning.	High cost.
Compost into a bin with bacteria on-site.	Not given.	Not enough room.
Donating.	Not given.	Regulations seemed burdensome.
Giving compost to a farmer.	Not given.	For the farmer to use the compost the proteins and produce had to be kept separate, which is hard in a dining atmosphere.
Liquefier, to remove liquid from the waste.	Not given.	Liquefier was too expensive.
Post-consumer composting.	Not given.	<ul style="list-style-type: none"> • There wasn't enough time to educate people. • Contamination.
Trayless dining.	Not given.	Whole dishwasher system requires trays and it would be a huge cost to change.

11. Are there any other systems or approaches that you didn't consider initially, but you may in the future? What are the pros and cons of those systems?

- Seven respondents were not considering any future systems, and an additional three respondents were unsure.

System	Pros	Cons
A company will put a huge dumpster on campus for food waste and come and haul it every week.	Not given.	More costly.
Better way to use compost from pulper.	Efficient use of end product.	Difficult to organize.
1) Donating; 2) Compost food waste from cafeterias.	Not given.	Not given.
Compost district-wide.	More reduction in waste.	Not given.
Composting in residence halls.	Not given.	Sustainability committee needs to take further action.
Compost in the individual buildings.	Not given.	<ul style="list-style-type: none"> • Logistics of a small scale operation. • Non-compost material staying out and not contaminating. • People willing to do it. • Sanitation and odor.
Composting with a vendor.	Not given.	More costly.

System	Pros	Cons
Donate waste to zoos.	Get rid of all the waste.	Not given.
Get better about not taking trays to rooms of patients who have already gone home.	Staff will have to have better communication.	Not given.
Post-consumer composting.	Not given.	Not given.
Post-consumer reduction with catering.	More effective.	Not given.

12. What are the main reasons you settled on the system you are using?

Ease of use (9)

- Both of the systems work well and are convenient. Both Table-to-Table and GreenRU come and pick up the food. Table-to-Table comes daily, GreenRU comes weekly.

Cost effective (4)

- Cheapest system to implement. (2)
- Less cost in going trayless because don't have to repurchase anything.
- Without the pulper they would have more food waste and have to have more dumpster collections which would be costly.

Reduce food waste (3)

Unsure (3)

Reduce food costs (2)

The right thing to do (2)

- Right thing to do, go green, sustainability.
- Was the right thing to do.

Other (4)

- Had to start small to prove effective. (2)
- Way of life and how respondent learned to live growing up on a farm.
- Useful end product.

13. What are the strengths of your system?

Reduce food waste (12)

- 30% reduction in food waste.
- 38% of waste is being diverted.
- 85% of waste was diverted.
- Eliminated Styrofoam containers and now use compostable to-go containers.
- Food not wasted and turned into a reusable product.
- Have a guideline for cooks to follow when purchasing food and making menus.

Cost effective (6)

- Cut production costs.
- Lower food costs.
- Reduce disposal costs.

Easy of use (3)

- Simple.
- Use post-consumer composting so students don't have to learn what can and cannot be composted.
- Vendor for composting was very helpful and is easy to work with.

Staff engagement (3)

- Employees have to pay more attention to their jobs, education.
- Staff awareness and willingness.
- Staff got engaged quickly.

The right thing to do (3)

- Good to give back to community.
- Right thing to do.
- Sustainability.

Other (6)

- Didn't need any more food waste management.
- Everything - it works really well.
- There is a farm really close to town with a friendly farmer that is willing to use compost.
- Used for landscaping on campus so the horticulture department doesn't have to buy any.
- Water usage dropped 66%.
- Wellness.

14. What are the weaknesses of your system?

More work for staff (7)

- Staff has to actually fill the sheet out to be effective. (2)
- Kitchen staff forgetting to fill the production sheet out.

Could do more (4)

- Better recycling for food preparers.
- Composting the end waste product from the pulper.
- Could do more with food waste such as composting.
- Potential to do more for composting.

None (4)

Rules/Regulations/Liability (4)

- Not every liquid can go to the landfill, have to find alternative, usually out of state.
- Contamination is possible if system gets out of control.
- If waste goes over 3 tons will have to stop because of DNR regulations.

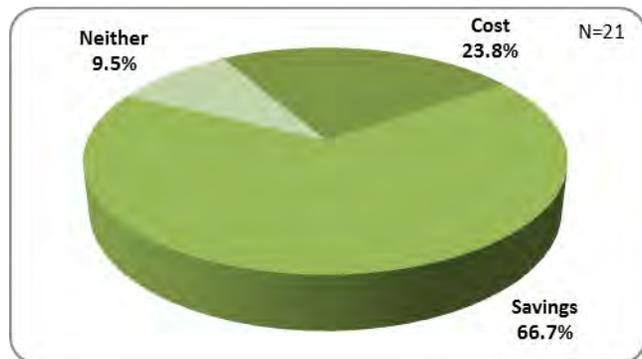
Odor (2)

Other (6)

- Bins take up a lot of room.
- Can't go trayless.
- Getting people educated.
- Harder to track savings when it's just written records and not computer generated.
- Students were resistant to give up their plastic straws.
- Transportation.

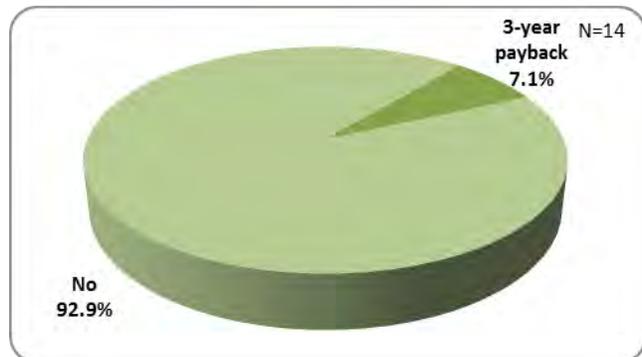
15. Is your food waste management system a net cost or a net savings to your organization?

- Fourteen respondents (about 67%) reported that their food waste management system was a net savings to their organization, while five respondents (roughly 24%) reported their system was a net cost.
- Two respondents (approximately 10%) reported their food waste management system was a wash, and didn't result in a net cost or savings.



15a. [If savings] Can you put a dollar figure to that?

- The majority of respondents (13 respondents or about 93%) could not associate a dollar figure with the net savings.
- One respondent (roughly 7%) reported their food waste management system resulted in a 3-year payback.



15b. [If savings] Where does the savings occur?

Disposal costs (8)

Lower food costs (3)

- Buy only food that they need. (2)

Production costs (2)

Other (4)

- Decreased water consumption.
- No cost, organizations come and pick it up.
- Staff time.
- Write off on taxes.

16. What are your future plans for your system?

No future plans (7)

Composting (6)

- Compost in residence halls/individual buildings. (2)
- Compost district-wide.
- Compost food waste from cafeterias.
- Compost with a vendor.
- Post-consumer composting.

Use compostable products (3)

- Stop using un-compostable products (plastic/Styrofoam/ketchup packets). (2)
- Start using compostable trays in the cafeterias.

Donation (2)

- Donate to zoos.

Source reduction (2)

- Better about not taking trays to rooms of patients who have already gone home.
- Use a pre-consumer food waste reduction program called "Lean Path" in the kitchen.

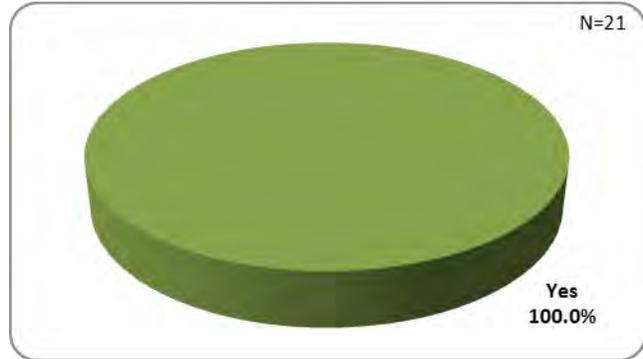
Unsure (2)

Other (6)

- Bins with bacteria on-site.
- Find a farmer to use end product from pulper.
- Large dumpster for food waste that is hauled every week.
- More education to students on reducing food waste.
- Post-consumer reduction with catering.
- Refining the current system and integrating pick-up routes.

17. If you had to do it all over again, would you?

- All 21 respondents would do it all over again.



17a. [If yes] Why?

Reduce food waste (13)

- Diverted almost half of our food waste. (2)

Good for the environment (5)

Reduce costs (2)

- Reduce disposal costs.
- Reduce food waste costs.

Other (1)

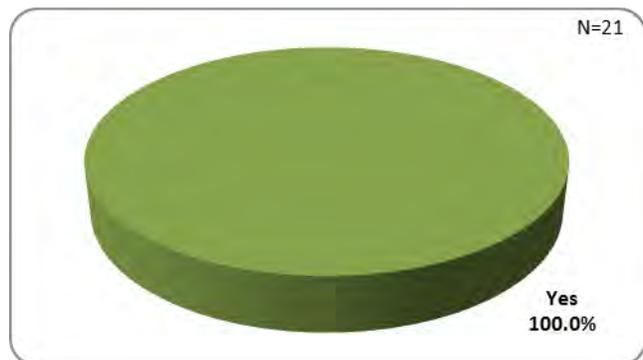
- Water savings.

17b. [If no] Why not?

Not applicable.

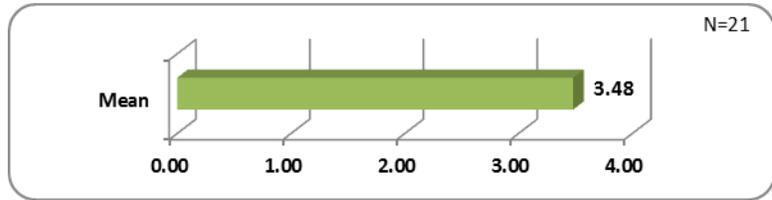
18. Would you recommend this system to your peers?

- All 21 respondents would recommend their food waste management system to their peers.



19. On a scale of 0 to 4 with 0 being not at all satisfied and 4 being very satisfied, how satisfied are you with your system overall?

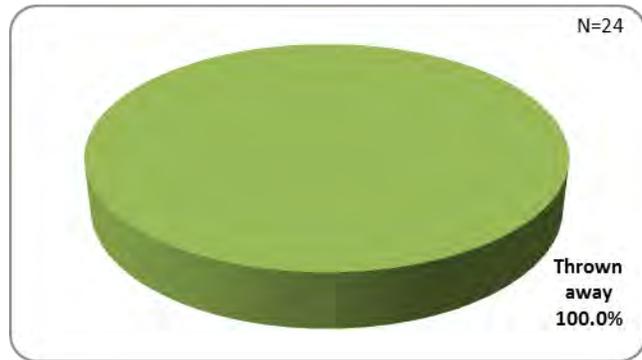
- Respondents were highly satisfied with their food waste management system, as shown by a mean of 3.48.



[If Q1 is no]

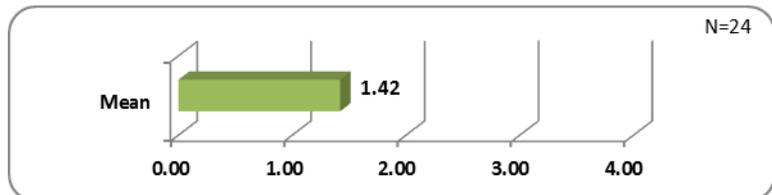
3. What does your organization currently do with your food waste?

- The entire respondent group threw away their food waste.



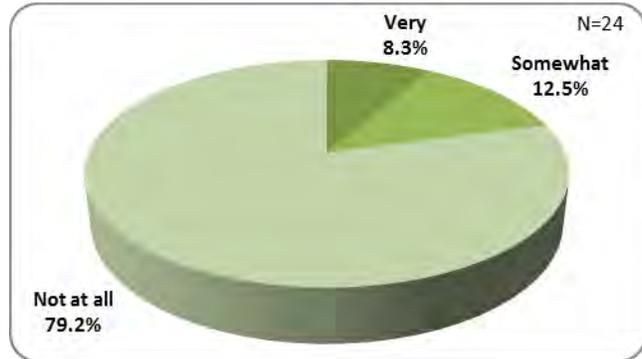
4. On a scale of 0 to 4 with 0 being not at all significant and 4 being very significant, how significant do you think the food waste problem is for your organization?

- In general, respondents did not feel that food waste was a significant problem for their organization, as shown by a mean of 1.42.



5. Would you say you are very familiar, somewhat familiar, or not at all familiar with food waste management systems or techniques?

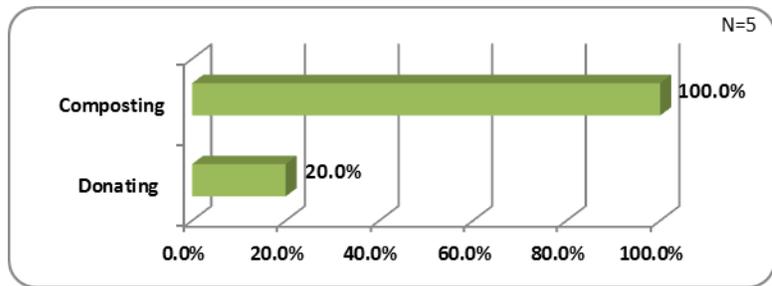
- Five respondents (about 21%) were very or somewhat familiar with food waste management systems or techniques.
- The remaining 19 respondents (roughly 79%) were not at all familiar with food waste management systems or techniques.



[If very or somewhat familiar]

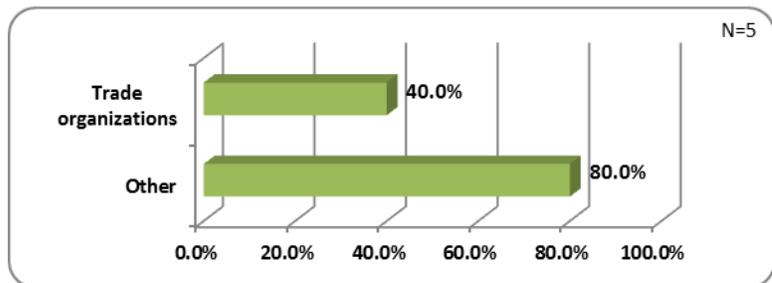
6. What systems are you familiar with?

- The entire respondent group was familiar with composting, and one respondent (20%) was familiar with donating.



7. How did you learn about them?

- Two respondents (40%) learned about food waste management systems or techniques from a trade organization.
- Other responses include:
 - Internet.
 - Long time in the business.
 - News.
 - Peers.



8. What do you like about them?

Good for the environment (2)

Yields a useful product (2)

- Good use of resources.
- Reuse waste instead of throwing it.

Other (1)

- Good to give back to the community.

8a. What do you dislike about them?

Nothing (2)

Other (5)

- Difficult to implement because no public acceptance.
- Expensive.
- Time consuming.
- Odor.
- Varmints.

9. What obstacles would you have to overcome to implement a system?

Don't have enough food waste (2)

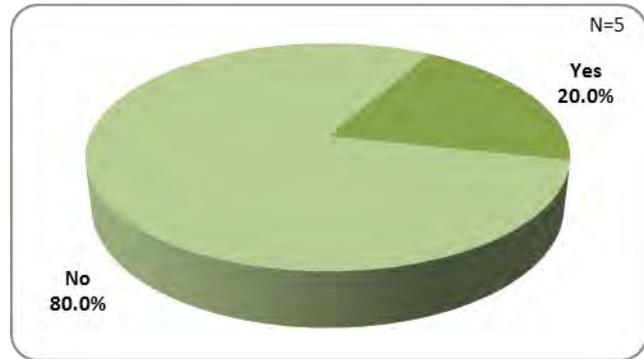
- Might not be effective at a hotel that only serves a small breakfast with not a lot of food waste.

Other (4)

- Logistics and in a timely fashion.
- Not many resources in a small town.
- Transportation.
- Willingness from administration to implement.

10. Do you have any future plans to implement a system?

- The majority of the respondent group (four respondents or 80%) did not have any future plans to implement a system.
- Only one respondent (20%) had future plans to implement a system.



[If yes]

11. What systems are you considering and why?

- The one respondent who had plans to implement a system was planning on composting.

12. How soon do you plan to implement your system?

- Conducting a pilot program next year; will have a compost bin in the cafeteria.

13. What information would you need to collect to make a decision?

- Dependent on the success of the pilot program.

14. What type of help would you need? Where would you go to get help?

- It will probably take more time. Would look to hire more staff.

General Recruiting Instructions

- We will be speaking to two different groups: Iowa landfills and large-food users.
 - There are 60 landfills in Iowa.
 - There will be 63 large-food users on the contact list. For the purposes of this study, large-food users are considered to be the following:
 - Colleges / Universities / Community Colleges
 - Grocery Chains / Discount Stores / Food Distributors
 - Hospitals
 - Hotels
 - K-12 School Districts
 - Restaurants
 - Retirement Communities
- We are looking to speak with a person qualified to answer questions regarding their organization's food waste.
 - For landfills, this will likely be either the educational coordinator or the general manager.
 - The person most qualified for large-food users will vary significantly depending on the organization; however, the most likely titles are listed below:
 - Colleges / Universities / Community Colleges – sustainability coordinator or food manager.
 - Grocery Chains / Discount Stores / Food Distributors – general manager.
 - Hospitals – sustainability coordinator or food manager.
 - Hotels – general manager.
 - K-12 School Districts – food manager.
 - Restaurants – general manager.
 - Retirement Communities – food manager.
 - In as many cases as possible you will be provided a contact name along with the phone number. If there is not contact listed, you will be responsible for finding the appropriate contact in the organization.
 - The goal of each call is to verify the point of contact listed is the appropriate person to complete the survey and secure their participation.
- If the large-food organization is part of a larger chain, determine if the contact is answering the survey for just his/her location or for multiple locations.
 - Each company/contact should be contacted a minimum of five times if they are not responding.
 - The first three calls should be no sooner than every other day and voicemails should be left.
 - [If it wasn't already done so during a previous call] After the first three voicemails are left, verify your contact is the correct person to be speaking with, verify they are in the office, and/or verify there is no one else equally qualified to help with the research.

Should someone else qualify, the process should be re-started as if it were a new contact.

- The last two calls should be made in an effort to catch a person in their office with no further voicemails.
- For the purposes of this study, a food waste management system is defined as anything a landfill or large-food user is doing to reduce or divert their food waste. This can include, but is not limited to:
 - [Landfills]** composting, educational programs, methane capturing, diversion (off-site composting).
 - [Large-food users]** source reduction, donation, composting.

Recruitment Script

Contact Name NOT provided

Hello, my name is [Interviewer name] and I'm calling from the University of Northern Iowa. I'm working on a study related to food waste reduction and am looking to speak with the person most knowledgeable about your organization's food waste. [If contact has no idea who that would be] Typically, I've been speaking with the...

[Landfill] Educational coordinator, general manager

[Large-food user] Sustainability coordinator, food manager

Once forwarded to a contact, continue under the "Contact Name provided" heading.

Contact Name provided, or after you have been forwarded to a contact

Hello [Contact name], my name is [Interviewer name]. I am calling on behalf of an on-campus research group at the University of Northern Iowa. I'm working on a project for UNI's Iowa Waste Reduction Center where we are trying to better understand how organizations in Iowa manage their food waste. I want to assure you, I am not trying to sell you anything, I'm simply conducting research. Are you the person to speak with regarding your organization's food waste?

[If no] Do you know who would be the most qualified person to speak with about this study? Could you please transfer me to him/her?

[If yes] Great, as I mentioned I am conducting research regarding food waste reduction and would like to ask you to take part in my study. I want to assure you that your participation is strictly voluntary and your responses will remain confidential. Any information you provide will be presented in aggregate form only. There are no foreseeable risks associated with participating and you may choose to discontinue participation at any time. My questions should take between 10-15 minutes of your time depending on the nature of your responses. The Iowa Waste Reduction Center will use the information we collect to design a food waste reduction program. Would you have a few minutes right now to answer some questions for me?

[If yes] Great! Thanks so much. If you have any questions about your participant rights, please feel free to contact Anita Gordon, UNI's IRB Administrator, at 319.273.6148. If you have any other questions, please feel free to contact my supervisor, Erin Bishop, at 319.273.3746.

[If no] Okay, I understand you are very busy, could I make an appointment with you to call you back? Or is there someone you work closely with who may have the time to help me?

Voicemails

First Round Voicemail

Hello, my name is [Interviewer name]. I'm calling from an on-campus research group at the University of Northern Iowa. I'm working on a research project related to food waste reduction. I want to assure you, I'm not trying to sell you anything; I'm simply conducting research to learn more about how your organization handles its food waste. Honestly, I'm not sure you are the appropriate person to be speaking with so if you could please give me a call back to either verify that you are the correct person or to direct me to a more appropriate person, I'd greatly appreciate it. Again, my name is [name] from the University of Northern Iowa and I can be reached at [number]. Thank you.

Second/Third Voicemail

Hello, my name is [Interviewer name]. I called a couple of days ago about a food waste reduction project I am working on. I want to assure you, I am not trying to sell you anything, I am simply conducting research and I think you may be the appropriate person to speak with regarding your organization's food waste. If you could give me a call back, I'd greatly appreciate it. Again, my name is [Interviewer name] from the University of Northern Iowa and I can be reached at [Number]. Thank you.

Food Waste Reduction Survey

Throughout this survey I'm going to refer to a "food waste management system." For the purposes of this study, a food waste management system is defined as anything your organization is doing to reduce or divert your food waste. This can include, but is not limited to:

[Landfills] composting, educational programs, methane capturing, diversion (off-site composting).

[Large-food users] source reduction, donation, composting.

1) Do you have a food waste management system in place?

Interviewer note: You should not offer the following answers, but should appropriately categorize the responses. Respondents may have multiple answers to this question.

[Landfills] A food waste management program may include, but is not limited to:

- Composting
- Educational programs
- Methane capturing
- Diversion (off-site composting)
- Other _____

[Large-food users] A food waste management program may include, but is not limited to:

- Source reduction (i.e. trayless dining in cafeterias, better inventory system, reducing portion sizes)
- Donation
- Composting
- Other _____

2) **[Landfills only]** Do you capture your methane gas?

- Yes -----> 2a) Is it used to generate electricity? Yes No
 No

[If Q1 is yes]

Interviewer note: Q3 – 18 refers to all components of the respondents' waste management system. For example, if a landfill's waste management system includes composting and educational programs, they should keep both of those things in mind when answering the following questions. Probe and record unique responses as necessary.

- 3) Why did you choose to implement a food waste management system?
- 4) Please describe your waste management system.
- 5) How long have you used this system?
 - a. What did you do with your food waste before this system was put in place?
- 6) Who within your organization helped you put your system together?

7) Who outside your organization helped you put your system together?

Interviewer note: You should not offer the following answers, but should appropriately categorize the responses. Respondents may have multiple answers to this question.

- Trade Association
- Consultant
- Government Organization
- Peer
- Other _____

8) What obstacles did you have to overcome?

Interviewer note: You should not offer the following answers, but should appropriately categorize the responses. Respondents may have multiple answers to this question.

- Transportation
- Disposal Facility
- Cost
- Time for internal staff
- Upper Management Support
- Other _____

a. How did you address those obstacles?

9) Were there any rules or regulations you had to follow when implementing your food waste program?

- Yes
- No

a. **[If yes]** Please explain the type of rules/regulations.

[Large food] Interviewer note: Open-ended, may have multiple answers.

[Landfills] Interviewer note: You should not offer the following answers, but should appropriately categorize the responses. Respondents may have multiple answers to this question.

- Permit modified
- Variance
- Didn't comply
- Other _____

b. **[If yes]** Who was the governing body of those rules/regulations?

Interviewer Note: Question should be asked of each rule/regulation/permit reported by the respondent.

- Internal rules/regulations
- City or other local authority
- County
- State
- Other _____

10) What other systems/approaches **did** you consider?

a. In your opinion, what were the pros and cons of the alternative systems?

11) Are there any other systems or approaches that you didn't consider initially, but you may in the future?

a. In your opinion, what are the pros and cons of those systems?

12) What were the main reasons you settled on the system you are using?

13) What are the strengths of your system?

14) What are the weaknesses of your system?

15) Is your food management system a net cost or net savings to your organization?

a. Can you put a dollar figure on that?

b. **[Net savings only]** Where does the net savings occur? For example, is the net savings a result of decreased water consumption, staff time, disposal costs, etc.

16) What are your future plans for your system?

17) If you had to do it all over again, would you?

Yes

No

a. **[If yes]** Why?

b. **[If no]** Why not?

18) Would you recommend this system to your peers?

Yes

No

19) On a scale of 0 to 4 with 0 being not at all satisfied and 4 being very satisfied, how satisfied with your system overall?

0 1 2 3 4

20) *Thank respondent for their time and direct them to the Iowa Waste Reduction website if they'd like more information on food waste management systems or techniques (www.foodwaste.iwrc.org).*

[If Q1 is no]

- 3) What does your organization currently do with your food waste?
- 4) On a scale of 0 to 4 with 0 being not at all significant and 4 being very significant, how significant do you think the food waste problem is for your organization?

0 1 2 3 4

- 5) Would you say you are very familiar, somewhat familiar, or not at all familiar with food waste management systems or techniques?

- Very familiar
- Somewhat familiar
- Not at all familiar

[If very or somewhat familiar]

- 6) What systems are you familiar with?
- 7) How did you learn about them?
- 8) What did you like about them?
 - a. What did you dislike about them?
- 9) What obstacles would you have to overcome to implement a system?
- 10) Do you have any future plans to implement a system?

[If yes]

- 11) What system are you considering and why?
- 12) How soon do you plan to implement your system?
- 13) What information would you need to collect to make a decision?
- 14) What type of help would you need?
 - a. Where would you go to get help?

15) *Thank respondent for their time and direct them to the Iowa Waste Reduction website if they'd like more information on food waste management systems or techniques (www.foodwaste.iwrc.org).*

[If no] *Thank respondent for their time and direct them to the Iowa Waste Reduction website if they'd like more information on food waste management systems or techniques (www.foodwaste.iwrc.org).*

[If not familiar] *Thank respondent for their time and direct them to the Iowa Waste Reduction website if they'd like more information on food waste management systems or techniques (www.foodwaste.iwrc.org).*

Attachment Three: Large Food User Data Tables

1. Do you have a food waste management system?

Statistics

N	Valid	45
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
No	24	53.3	53.3	53.3
Valid Yes	21	46.7	46.7	100.0
Total	45	100.0	100.0	

1a. [If yes] What reduction and/or diversion techniques are included in your food waste management system?

Statistics

		Q1aComposting	Q1aSourceReduction	Q1aDonation	Q1aOther
N	Valid	21	21	21	21
	Missing	0	0	0	0

Frequency Table: Q1aComposting

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Composting	10	47.6	47.6	47.6
Total	21	100.0	100.0	100.0

Frequency Table: Q1aSourceReduction

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Source reduction	13	61.9	61.9	61.9
Total	21	100.0	100.0	100.0

Frequency Table: Q1aDonation

	Frequency	Percent	Valid Percent	Cumulative Percent
	13	61.9	61.9	61.9
Valid Donating	8	38.1	38.1	100.0
Total	21	100.0	100.0	

Frequency Table: Q1aOther

	Frequency	Percent	Valid Percent	Cumulative Percent
	18	85.7	85.7	85.7
Valid Feed for the animals on the farm	1	4.8	4.8	90.5
Trayless dining	2	9.5	9.5	100.0
Total	21	100.0	100.0	

2. Do you capture your methane gas?¹

2a. [If yes] Is it used to generate electricity?²

[If Q1 is yes]

3. Why did you choose to implement a food waste management system?

Statistics

N	Valid	21
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1) #1 source of waste was food on campus; 2) Built a new student center and saw the opportunity to add food waste reduction at the new site	1	4.8	4.8	4.8
1) Corporate benefit, tax deductions; 2) Reduce disposal costs	1	4.8	4.8	9.5

¹ Question only asked only of landfills.

² Question only asked only of landfills.

1) Cost associated with disposal; 2) Cost/savings with purchasing un-needed food	1	4.8	4.8	14.3
1) Philosophy and way of life on a farm	1	4.8	4.8	19.0
1) Reduce food cost when implementing source reduction; 2) Recycle pre-consumer waste	1	4.8	4.8	23.8
1) Reduce food waste because we pay to purchase the food and then pay to dispose of it as well	1	4.8	4.8	28.6
1) Reducing amount of material that is going to the landfill, divert 60% of waste by 2020	1	4.8	4.8	33.3
Be more efficient and not waste food or money	1	4.8	4.8	38.1
Beneficial for horticulture department	1	4.8	4.8	42.9
Conscience about the environment	1	4.8	4.8	47.6
Corporate office decided to	1	4.8	4.8	52.4
Corporate told them to implement this system.	1	4.8	4.8	57.1
Cut food waste	1	4.8	4.8	61.9
Goes along with what Costco is about doing, the right thing to do	1	4.8	4.8	66.7
Not throwing away as much	1	4.8	4.8	71.4
Reduce food waste	3	14.3	14.3	85.7
Reduce waste	1	4.8	4.8	90.5
To cut production costs and lower high volume of food waste	1	4.8	4.8	95.2
To help people out; it's the right thing to do.	1	4.8	4.8	100.0
Total	21	100.0	100.0	

4. Please describe your food waste management system.

Statistics

N	Valid	21
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
1) All kitchen staff weigh waste before it is thrown away and record the reason of disposing, put in clear bins to make staff more aware of waste, weekly reports produced and production and purchasing changes made as necessary; 2) Compost food from the kitchens and patient trays done by off-site vendor	1	4.8	4.8	4.8
1) Compost in the culinary department; 2) Use a pulper in dining services; 3) Trayless dining	1	4.8	4.8	9.5
1) Compost with Green-R-U, off-site hauler and composter; 2) Better production in food services, source reduction	1	4.8	4.8	14.3
1) Donate during the year to food shelters; 2) Left over money in food expense account they donate to local business; 3) Compost with a third party vendor in kitchens and dining halls	1	4.8	4.8	19.0
1) Donate to salvation army and food bank	1	4.8	4.8	23.8
1) Keep a book to track food that is thrown away	1	4.8	4.8	28.6

1) Kitchen staff documents food waste; 2) Patient orders by room service now	1	4.8	4.8	33.3
1) Non-fridge food donated to local shelters; 2) Perishable foods are collected in bins and collected weekly to be composted off-site	1	4.8	4.8	38.1
1) Pilot program, off-site composting at high school and one elementary	1	4.8	4.8	42.9
1) Pulper in the dining hall; 2) Fully compostable graduation picnic, and haul food and degradable plates and silverware out to a bigger composter	1	4.8	4.8	47.6
1) Pulpers in 2 locations on campus; 2) Student-led organization that has a small scale composting operation, 6 locations on and off campus	1	4.8	4.8	52.4
1) Trayless; 2) Donate to student organization that gives food to church groups	1	4.8	4.8	57.1
1) Trayless; 2) Software that analyzes food waste to make for more efficient production; 3) Donate to food bank; 4) Compost pre-consumer waste	1	4.8	4.8	61.9
All food waste goes to the cats, dogs, and chickens on the farm	1	4.8	4.8	66.7
Donate all the food that they can to food banks, not damaged product. Even donate dog and cat food to humane societies.	1	4.8	4.8	71.4

Donate food to Table-to-Table (a local food rescue organization) and compost through GreenRU. Any waste in the kitchen, bakery and produce is recycled in some way.	1	4.8	4.8	76.2
Donated to food banks	1	4.8	4.8	81.0
Kitchen staff keeps production sheets	1	4.8	4.8	85.7
On-campus composting	1	4.8	4.8	90.5
Production records kept by the cooks in the cafeteria	1	4.8	4.8	95.2
Switched to room service so now patients only get the amount of food they need and what they want to eat	1	4.8	4.8	100.0
Total	21	100.0	100.0	

5. How long have you used the system?

Statistics

N	Valid	21
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
1 1/2 years	1	4.8	4.8	4.8
1 year	1	4.8	4.8	9.5
1) Composting for 1 1/2 years; 2) Source reduction for 3 years	1	4.8	4.8	14.3
1) Donating for 3 years; 2) Trayless for 5 years	1	4.8	4.8	19.0
1) Tracking food waste since 2008; 2) Composting since 2011	1	4.8	4.8	23.8
10 years	1	4.8	4.8	28.6
2 years	3	14.3	14.3	42.9
2011.	1	4.8	4.8	47.6

4 months	1	4.8	4.8	52.4
4 years	2	9.5	9.5	61.9
5 years	1	4.8	4.8	66.7
6 months	1	4.8	4.8	71.4
6 years	1	4.8	4.8	76.2
Donate - 15 years; Compost - 2 months.	1	4.8	4.8	81.0
Donate - 5 years; Compost - 1 year	1	4.8	4.8	85.7
Forever	1	4.8	4.8	90.5
over 19 years	1	4.8	4.8	95.2
Unsure. Manager has been there for 2 years and it has been in place long before he got there.	1	4.8	4.8	100.0
Total	21	100.0	100.0	

5a. What did you do with your food waste before this system was put in place?

Statistics

N	Valid	19
	Missing	2

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Thrown away	19	90.5	100.0	100.0
Missing 99999	2	9.5		
Total	21	100.0		

6. Who within your organization helped you put your system together?

Statistics

	Y-Q6	YQ6DirectorFSor FSstaff	YQ6ExecutiveChe f	YQ6CorporateOffi ceorRegionalOffic e	YQ6Sustainability Dept
N	Valid	21	21	21	21
	Missing	0	0	0	0

Frequency Table: Y-Q6Other

	Frequency	Percent	Valid Percent	Cumulative Percent
	12	57.1	57.1	57.1
Valid Area managers	1	4.8	4.8	61.9
Campus ministry; Student organization	1	4.8	4.8	66.7
Dietitian	1	4.8	4.8	71.4
Grounds services	1	4.8	4.8	76.2
Just the respondent.	1	4.8	4.8	81.0
Operations	1	4.8	4.8	85.7
Owner	1	4.8	4.8	90.5
Salvation army; Food bank	1	4.8	4.8	95.2
Unsure	1	4.8	4.8	100.0
Total	21	100.0	100.0	

Frequency Table: YQ6DirectorFSorFSstaff

	Frequency	Percent	Valid Percent	Cumulative Percent
	7	33.3	33.3	33.3
Valid Dining staff	1	4.8	4.8	38.1
Dinning office	1	4.8	4.8	42.9
Director	1	4.8	4.8	47.6
Director and staff in Food Service	1	4.8	4.8	52.4
Director of Food Service	4	19.0	19.0	71.4
Food and nutrition department	2	9.5	9.5	81.0
Food service department	2	9.5	9.5	90.5
Food service director	1	4.8	4.8	95.2
Residence Dining Services	1	4.8	4.8	100.0
Total	21	100.0	100.0	

Frequency Table: YQ6ExecutiveChef

	Frequency	Percent	Valid Percent	Cumulative Percent
	19	90.5	90.5	90.5
Valid Executive chef	2	9.5	9.5	100.0
Total	21	100.0	100.0	

Frequency Table: YQ6CorporateOfficeorRegionalOffice

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Corporate office	19	90.5	90.5	90.5
	Regional office	2	9.5	9.5	100.0
	Total	21	100.0	100.0	

Frequency Table: YQ6SustainabilityDept

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Sustainability Action Committee	18	85.7	85.7	85.7
	Sustainability Department	1	4.8	4.8	90.5
	Sustainability Department	2	9.5	9.5	100.0
	Total	21	100.0	100.0	

7. Who outside your organization helped you put your system together?

Statistics

		Y-Q7None	Y-Q7Consultant	Y-Q7Off-site composting vendor	Y-Q7Government Agency	Y-Q7Other	YQ7Unsure
N	Valid	21	21	21	21	21	21
	Missing	0	0	0	0	0	0

Frequency Table: Y-Q7None

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	12	57.1	57.1	57.1
	None	9	42.9	42.9	100.0
	Total	21	100.0	100.0	

Frequency Table: Y-Q7Consultant

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Consultant	19	90.5	90.5	90.5
	Consultant	2	9.5	9.5	100.0
	Total	21	100.0	100.0	

Frequency Table: Y-Q7Off-site composting vendor

	Frequency	Percent	Valid Percent	Cumulative Percent
	16	76.2	76.2	76.2
Off-site composter, Green-R-U	1	4.8	4.8	81.0
Off-site composting company	1	4.8	4.8	85.7
Valid Off-site composting vendor	1	4.8	4.8	90.5
Off-site hauler	1	4.8	4.8	95.2
Third party vendor	1	4.8	4.8	100.0
Total	21	100.0	100.0	

Frequency Table: Y-Q7Government Agency

	Frequency	Percent	Valid Percent	Cumulative Percent
	19	90.5	90.5	90.5
DNR	1	4.8	4.8	95.2
Valid Linn County Solid Waste Agency	1	4.8	4.8	100.0
Total	21	100.0	100.0	

Frequency Table: Y-Q7Other

	Frequency	Percent	Valid Percent	Cumulative Percent
	18	85.7	85.7	85.7
Food Bank	1	4.8	4.8	90.5
Valid Peers	1	4.8	4.8	95.2
Shelters	1	4.8	4.8	100.0
Total	21	100.0	100.0	

Frequency Table: Y-Q7Unsure

	Frequency	Percent	Valid Percent	Cumulative Percent
	18	85.7	85.7	85.7
Valid Unsure.	3	14.3	14.3	100.0
Total	21	100.0	100.0	

8. What obstacles did you have to overcome? How did you address those obstacles?

Statistics

		Y-Q8Cost	Y-Q8Transportation	Y-Q8Time for internal staff	Y-Q8None	Y-Q8Other	Y-Q8a
N	Valid	21	21	21	21	21	21
	Missing	0	0	0	0	0	0

Frequency Table: Y-Q8Cost

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Cost	16	76.2	76.2	76.2
	Too costly to have pulpers in both dining halls	4	19.0	19.0	95.2
		1	4.8	4.8	100.0
	Total	21	100.0	100.0	

Frequency Table: Y-Q8Transportation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Transportation	18	85.7	85.7	85.7
		3	14.3	14.3	100.0
	Total	21	100.0	100.0	

Frequency Table: Y-Q8Time for internal staff

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Time for internal staff	15	71.4	71.4	71.4
		6	28.6	28.6	100.0
	Total	21	100.0	100.0	

Frequency Table: Y-Q8None

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	17	81.0	81.0	81.0
		4	19.0	19.0	100.0
	Total	21	100.0	100.0	

Frequency Table: Y-Q8Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2) Land for compost; 3) Perceptions on composting	14	66.7	66.7	66.7
		1	4.8	4.8	71.4

Leadership in Food Service Department	1	4.8	4.8	76.2
Liability	1	4.8	4.8	81.0
Unsure	3	14.3	14.3	95.2
Using end product from pulper	1	4.8	4.8	100.0
Total	21	100.0	100.0	

Frequency Table: Y-Q8a

	Frequency	Percent	Valid Percent	Cumulative Percent
	6	28.6	28.6	28.6
after first day it was fine	1	4.8	4.8	33.3
Didn't take long to get used to recording	1	4.8	4.8	38.1
Getting more people involved in donating to lower transportation costs	1	4.8	4.8	42.9
Got the logistics ironed out	1	4.8	4.8	47.6
Haven't overcome yet	2	9.5	9.5	57.1
Made prep easier in the long run	1	4.8	4.8	61.9
Off-site vendor now gives the kitchen 30 gallon bins on rollers for compost pick up	1	4.8	4.8	66.7
Production sheet actually made prep easier	1	4.8	4.8	71.4
Reconstructed the dining halls to make just one and could now afford a pulper	1	4.8	4.8	76.2
Safe guards for liability	1	4.8	4.8	81.0
Staff learned pretty fast	1	4.8	4.8	85.7
Staff took it on easily and seem like they want to help reduce food waste	1	4.8	4.8	90.5
Started small so they could show success	1	4.8	4.8	95.2
Unsure	1	4.8	4.8	100.0
Total	21	100.0	100.0	

9. Were there any rules or regulations you had to follow when implementing your food waste management system?

Statistics

N	Valid	21
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	15	71.4	71.4
	Unsure	2	9.5	81.0
	Yes	4	19.0	100.0
	Total	21	100.0	100.0

9a. [If yes] Please explain the type of rules/regulations.

Statistics

N	Valid	4
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1) Expiration dates; 2) No crushed cans	1	25.0	25.0
	Couldn't store food waste inside	1	25.0	50.0
	Other - Table-to-Table and GreenRU have rules about what can/can't be donated and what can/can't be composted.	1	25.0	75.0
	Wearing gloves and making sure food isn't spoiled	1	25.0	100.0
	Total	4	100.0	100.0

9b. [If yes] Who was the governing body of those rules/regulations?

Statistics

N	Valid	4
	Missing	0

Y-Q9b

	Frequency	Percent	Valid Percent	Cumulative Percent
FDA	1	25.0	25.0	25.0
Internal rules	2	50.0	50.0	75.0
Valid Table-to-Table and GreenRU	1	25.0	25.0	100.0
Total	4	100.0	100.0	

10. What other systems/approaches did you consider? What were the pros and cons of the alternative systems?

Statistics

		Y-Q10	Y-Q10a
N	Valid	21	21
	Missing	0	0

Frequency Table: Y-Q10

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1) Liquefier, to remove liquid from the waste; 2) Giving compost to a farmer	1	4.8	4.8	4.8
Additional composting	1	4.8	4.8	9.5
Compost into a bin with bacteria on-site	1	4.8	4.8	14.3
Donating	1	4.8	4.8	19.0
Knew a cafeteria in Iowa City tried post-consumer composting	1	4.8	4.8	23.8
None	12	57.1	57.1	81.0
Trayless dining	1	4.8	4.8	85.7
Unsure	3	14.3	14.3	100.0
Total	21	100.0	100.0	

Frequency Table: Y-Q10a

	Frequency	Percent	Valid Percent	Cumulative Percent
	15	71.4	71.4	71.4
Valid 1) Keep small in beginning; 2) High cost	1	4.8	4.8	76.2
1) Liquefier was too expensive; 2) For the farmer to use the compost the proteins and produce had to be kept separate which is hard in a dining atmosphere	1	4.8	4.8	81.0
Failed because 1) there wasn't enough time to educate people; 2) contamination	1	4.8	4.8	85.7
Not enough room	1	4.8	4.8	90.5
Regulations seemed burdensome	1	4.8	4.8	95.2
Whole dishwasher system requires trays and it would be a huge cost to change	1	4.8	4.8	100.0
Total	21	100.0	100.0	

11. Are there any other systems or approaches that you didn't consider initially, but you may in the future? What are the pros and cons of those systems?

Statistics

		Y-Q11	Y-Q11a
N	Valid	21	21
	Missing	0	0

Frequency Table: Y-Q11

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1) Donating; 2) Compost food waste from cafeterias	1	4.8	4.8	4.8
1) Logistics to figure out dumpsters; 2) Post-consumer reduction possibly with catering	1	4.8	4.8	9.5

A company will put a huge dumpster on campus for food waste and come and haul it every week	1	4.8	4.8	14.3
Better about not taking trays to rooms of patients who have already gone home	1	4.8	4.8	19.0
Better way to use the compost from the pulper	1	4.8	4.8	23.8
Composting in residence halls	1	4.8	4.8	28.6
Composting with a vendor	1	4.8	4.8	33.3
Donate waste to zoo's	1	4.8	4.8	38.1
Going district-wide	1	4.8	4.8	42.9
Individual buildings composting	1	4.8	4.8	47.6
None	7	33.3	33.3	81.0
Post-consumer composting	1	4.8	4.8	85.7
Unsure	3	14.3	14.3	100.0
Total	21	100.0	100.0	

Frequency Table: Y-Q11a

	Frequency	Percent	Valid Percent	Cumulative Percent
	11	52.4	52.4	52.4
1) Logistics of a small scale operation; 2) Non-compost material staying out and not contaminating; 3) People willing to do it; 4) sanitation and odor	1	4.8	4.8	57.1
Better communication	1	4.8	4.8	61.9
Getting rid of all the waste	1	4.8	4.8	66.7
More costly	1	4.8	4.8	71.4
Valid More efficient use of end product but may be difficult to organize	1	4.8	4.8	76.2
More effective	1	4.8	4.8	81.0
More reduction in waste	1	4.8	4.8	85.7
None	1	4.8	4.8	90.5
Sustainability committee needs to further that action	1	4.8	4.8	95.2
Too costly	1	4.8	4.8	100.0
Total	21	100.0	100.0	

12. What are the main reasons you settled on the system you are using?

Statistics

N	Valid	21
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
1) Easy to implement; 2) Easy to train employees	1	4.8	4.8	4.8
1) Easy; 2) Started small to show success	1	4.8	4.8	9.5
1) Less cost in going trayless because don't have to repurchase; 2) Without the pulper they would have more food waste and have to have more dumpster collections which would be costly	1	4.8	4.8	14.3
Both of the systems work well and are convenient. Both Table-to-Table and GreenRU come and pick up the food. Table-to-Table comes daily, GreenRU comes weekly.	1	4.8	4.8	19.0
Valid Cost competitive system	1	4.8	4.8	23.8
Cut cost in breakfast expenditures	1	4.8	4.8	28.6
Cut food waste	1	4.8	4.8	33.3
Ease of use	1	4.8	4.8	38.1
Easiest and cheapest	1	4.8	4.8	42.9
Food costs	1	4.8	4.8	47.6
Had to start small to prove effective	1	4.8	4.8	52.4
Less material going to the landfill	1	4.8	4.8	57.1
Right thing to do, go green, sustainability	1	4.8	4.8	61.9
Simple	1	4.8	4.8	66.7

Simple and easiest	1	4.8	4.8	71.4
Unsure	3	14.3	14.3	85.7
Useful end product and reducing waste	1	4.8	4.8	90.5
Was the right thing to do	1	4.8	4.8	95.2
Way of life and how she learned to live growing up on a farm	1	4.8	4.8	100.0
Total	21	100.0	100.0	

13. What are the strengths of your system?

Statistics

N	Valid	21
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1) Employees have to pay more attention to their jobs, education; 2) Effective waste reduction	1	4.8	4.8	4.8
Valid 1) Farm really close to town with a friendly farmer that is willing to use compost; 2) Low tech, so not too costly	1	4.8	4.8	9.5
Valid 1) Food not wasted and turned into a reusable product; 2) Right thing to do	1	4.8	4.8	14.3
Valid 1) Lower food costs; 2) Wellness	1	4.8	4.8	19.0
Valid 1) Reduce disposal costs; 2) Easy way to reduce food waste	1	4.8	4.8	23.8
Valid 1) Reduce waste; 2) Guideline for other cooks to follow when purchasing food and making menus	1	4.8	4.8	28.6

1) Simple; 2) Staff got engaged quickly; 3) Vendor for composting was very helpful and is easy to work with	1	4.8	4.8	33.3
1) Staff awareness and willingness; 2) 38% of waste is being diverted	1	4.8	4.8	38.1
1) Sustainability; 2) Less waste	1	4.8	4.8	42.9
1) They use post-consumer composting so students don't have to learn what can and cannot be composted; 2) Didn't need any more food waste management	1	4.8	4.8	47.6
1) Water usage dropped 66%; 2) Eliminated Styrofoam containers and now use compostable to-go containers	1	4.8	4.8	52.4
30% reduction in food waste	1	4.8	4.8	57.1
85% of waste was diverted	1	4.8	4.8	61.9
Always aware of being wasteful	1	4.8	4.8	66.7
Cost effective in the long run	1	4.8	4.8	71.4
Cut production costs	1	4.8	4.8	76.2
Everything - it works really well.	1	4.8	4.8	81.0
Good to give back to community	1	4.8	4.8	85.7
No direct costs	1	4.8	4.8	90.5
Reduced food waste significantly	1	4.8	4.8	95.2
Used for landscaping on campus and horticulture department doesn't have to buy any	1	4.8	4.8	100.0
Total	21	100.0	100.0	

14. What are the weaknesses of your system?

Statistics

N	Valid	21
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
1) Better recycling for food preparers; 2) Composting the end waste product from the pulper	1	4.8	4.8	4.8
1) Bins take up a lot of room	1	4.8	4.8	9.5
1) Can't do trayless; 2) If waste goes over 3 tons will have to stop because of DNR regulations	1	4.8	4.8	14.3
1) Could do more with food waste such as composting; 2) Any liquid can't go to the landfill, have to find alternative, usually out of state	1	4.8	4.8	19.0
1) Harder to track savings when just written records and not computer generated; 2) Potential to do more for composting	1	4.8	4.8	23.8
1) Liability	1	4.8	4.8	28.6
1) Odor at first from contamination; 2) Getting people educated	1	4.8	4.8	33.3
1) Odor; 2) Transportation	1	4.8	4.8	38.1
1) Students were resistant to give up their plastic straws; 2) Contamination is possible if system gets out of control	1	4.8	4.8	42.9
Haven't seen any yet	1	4.8	4.8	47.6
Kitchen staff forgetting to fill the production sheet out	1	4.8	4.8	52.4
More labor	1	4.8	4.8	57.1
More work for internal staff	1	4.8	4.8	61.9

None	2	9.5	9.5	71.4
None so far	1	4.8	4.8	76.2
None.	1	4.8	4.8	81.0
Staff has to actually fill the sheet out to be effective	1	4.8	4.8	85.7
Takes staff extra time	1	4.8	4.8	90.5
Taking the time to fill out the production sheet	1	4.8	4.8	95.2
Time intensive	1	4.8	4.8	100.0
Total	21	100.0	100.0	

15. Is your food waste management system a net cost or a net savings to your organization?

Statistics

N	Valid	21
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Cost	5	23.8	23.8
	Neither	2	9.5	33.3
	Savings	14	66.7	100.0
	Total	21	100.0	100.0

15a. [If savings] Can you put a dollar figure to that?

Statistics

N	Valid	14
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3 year payback	1	7.1	7.1
	No	13	92.9	100.0
	Total	14	100.0	100.0

15b. [If savings] Where does the savings occur?

Statistics

		Y-Q15bDisposal costs	Y-Q15bLower food cost	Y-Q15bOther
N	Valid	14	14	14
	Missing	0	0	0

Frequency Table: Y-Q15bDisposal costs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disposal costs	6	42.9	42.9	42.9
	Disposal Costs	7	50.0	50.0	92.9
	Disposal Costs	1	7.1	7.1	100.0
	Total	14	100.0	100.0	

Frequency Table: Y-Q15bLower food cost

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Buy only food that they need	11	78.6	78.6	78.6
	Don't have to purchase as much food	1	7.1	7.1	85.7
	Lower food cost	1	7.1	7.1	92.9
	Lower food cost	1	7.1	7.1	100.0
	Total	14	100.0	100.0	

Frequency Table: Y-Q15bOther

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1) No cost, organizations come and pick it up; 2) Write off on taxes	9	64.3	64.3	64.3
	Decreased water consumption	1	7.1	7.1	71.4
	Production costs	1	7.1	7.1	78.6
	Staff time	2	14.3	14.3	92.9
	Staff time	1	7.1	7.1	100.0
	Total	14	100.0	100.0	

16. What are your future plans for your system?

Statistics

N	Valid	21
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
1) Compost in residence halls; 2) Use a pre-consumer food waste reduction program called "Lean Path" in the kitchen	1	4.8	4.8	4.8
1) Donate to zoo's; 2) Bins with bacteria on-site	1	4.8	4.8	9.5
1) Donating; 2) Compost food waste from cafeterias	1	4.8	4.8	14.3
1) Find a farmer to use end product from pulper; 2) Get away from un-compostable products (plastic forks/knives/spoons, ketchup packets)	1	4.8	4.8	19.0
1) Go district wide with composting; 2) Start using a compostable tray in the cafeterias	1	4.8	4.8	23.8
1) More education to students on reducing food waste; 2) Get rid of plastic and Styrofoam	1	4.8	4.8	28.6
1) Small scale composting in individual buildings; 2) Refining the current system and integrating pick-up routes	1	4.8	4.8	33.3
Better about not taking trays to rooms of patients who have already gone home	1	4.8	4.8	38.1
Composting with a vendor	1	4.8	4.8	42.9

Large dumpster for food waste that is hauled every week	1	4.8	4.8	47.6
No future plans, keep doing what they are doing	1	4.8	4.8	52.4
None	5	23.8	23.8	76.2
Not able to answer.	1	4.8	4.8	81.0
Not at the moment	1	4.8	4.8	85.7
Post-consumer composting	1	4.8	4.8	90.5
Post-consumer reduction with catering	1	4.8	4.8	95.2
Unsure	1	4.8	4.8	100.0
Total	21	100.0	100.0	

17. If you had to do it all over again, would you?

Statistics

N	Valid	21
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	21	100.0	100.0	100.0

17a. [If yes] Why?

Statistics

N	Valid	21
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Cut food waste in 1/2	1	4.8	4.8	4.8
Diverted almost half food waste	1	4.8	4.8	9.5
Valid Environmentally friendly	1	4.8	4.8	14.3
Reduce disposal costs	1	4.8	4.8	19.0
Reduce food waste	11	52.4	52.4	71.4
Reduce food waste costs	1	4.8	4.8	76.2

Right thing to do	3	14.3	14.3	90.5
Sustainability	1	4.8	4.8	95.2
Water savings	1	4.8	4.8	100.0
Total	21	100.0	100.0	

17b. [If no] Why not?

Not applicable.

18. Would you recommend this system to your peers?

Statistics

N	Valid	21
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	21	100.0	100.0	100.0

19. On a scale of 0 to 4 with 0 being not at all satisfied and 4 being very satisfied, how satisfied are you with your system overall?

Statistics

N	Valid	21
	Missing	0
Mean		3.48
Sum		73

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 2	1	4.8	4.8	4.8
Valid 3	9	42.9	42.9	47.6
Valid 4	11	52.4	52.4	100.0
Total	21	100.0	100.0	

[If Q1 is no]

3. What does your organization currently do with your food waste?

Statistics

N	Valid	24
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Thrown away	24	100.0	100.0	100.0

4. On a scale of 0 to 4 with 0 being not at all significant and 4 being very significant, how significant do you think the food waste problem is for your organization?

Statistics

N	Valid	24
	Missing	0
Mean		1.42
Sum		34

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 0	4	16.7	16.7	16.7
Valid 1	11	45.8	45.8	62.5
Valid 2	5	20.8	20.8	83.3
Valid 3	3	12.5	12.5	95.8
Valid 4	1	4.2	4.2	100.0
Total	24	100.0	100.0	

5. Would you say you are very familiar, somewhat familiar, or not at all familiar with food waste management systems or techniques?

Statistics

N	Valid	24
	Missing	0

Frequency Table

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all familiar	19	79.2	79.2	79.2
	Somewhat familiar	3	12.5	12.5	91.7
	Very familiar	2	8.3	8.3	100.0
	Total	24	100.0	100.0	

[If very or somewhat familiar]

6. What systems are you familiar with?

Statistics

		N- Q6Composting	N-Q6Donating
N	Valid	5	5
	Missing	0	0

Frequency Table: N-Q6Composting

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Composting	5	100.0	100.0	100.0

Frequency Table: N-Q6Donating

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Donating	4	80.0	80.0	80.0
	Composting	1	20.0	20.0	100.0
	Total	5	100.0	100.0	

7. How did you learn about them?

Statistics

N	Valid	5
	Missing	0

Frequency Table

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1) Internet; 2) News	1	20.0	20.0	20.0
	Being in the business	1	20.0	20.0	40.0
	Friends in gardening	1	20.0	20.0	60.0

Head of FFA as well	1	20.0	20.0	80.0
National trade organization	1	20.0	20.0	100.0
Total	5	100.0	100.0	

8. What do you like about them?

Statistics

N	Valid	5
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	Good idea and green	1	20.0	20.0	20.0
	Good thing to do	1	20.0	20.0	40.0
	Good to give back to the community	1	20.0	20.0	60.0
	Good use of resources	1	20.0	20.0	80.0
	Reuse waste instead of throwing it	1	20.0	20.0	100.0
	Total	5	100.0	100.0	

8a. What do you dislike about them?

Statistics

N	Valid	5
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	1) Timely; 2) Costly	1	20.0	20.0	20.0
	Difficult to implement because no public acceptance	1	20.0	20.0	40.0
	Nothing	2	40.0	40.0	80.0
	Odor and varmints	1	20.0	20.0	100.0
	Total	5	100.0	100.0	

9. What obstacles would you have to overcome to implement a system?

Statistics

N	Valid	5
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1) Logistics and in a timely fashion	1	20.0	20.0	20.0
1) Quantity; 2) Transportation	1	20.0	20.0	40.0
Might not be effective at a hotel that only serves a small breakfast with not a lot of food waste	1	20.0	20.0	60.0
Not many resources in a small town	1	20.0	20.0	80.0
Willingness from administration to implement	1	20.0	20.0	100.0
Total	5	100.0	100.0	

10. Do you have any future plans to implement a system?

Statistics

N	Valid	5
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid No	4	80.0	80.0	80.0
Yes	1	20.0	20.0	100.0
Total	5	100.0	100.0	

[If yes]

11. What systems are you considering and why?

Statistics

N	Valid	1
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Composting	1	100.0	100.0	100.0

12. How soon do you plan to implement your system?

Statistics

N	Valid	1
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Pilot program at elementary next year, compost bin in cafeteria	1	100.0	100.0	100.0

13. What information would you need to collect to make a decision?

Statistics

N	Valid	1
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Success of pilot program	1	100.0	100.0	100.0

14. What type of help would you need? Where would you go to get help?

Statistics

N	Valid	1
	Missing	0

Frequency Table

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More time	1	100.0	100.0	100.0

Statistics

N	Valid	1
	Missing	0

Frequency Table

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Additional staff	1	100.0	100.0	100.0

Attachment Two: Landfill Data Tables

1. Do you have a food waste management system?

Statistics

N	Valid	37
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
No	31	83.8	83.8	83.8
Valid Yes	6	16.2	16.2	100.0
Total	37	100.0	100.0	

1a. [If yes] What reduction and/or diversion techniques are included in your food waste management system?

Statistics

	Q1a. Composting	Q1a. Educational Programs	Q1a. Methane capturing	Q1a. Diversion
N Valid	5	3	6	1
Missing	1	3	0	5

Frequency Table: Q1a. Composting

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Composting	5	83.3	100.0	100.0
Missing 99999	1	16.7		
Total	6	100.0		

Frequency Table: Q1a. Educational Programs

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Educational programs	3	50.0	100.0	100.0
Missing 99999	3	50.0		
Total	6	100.0		

Frequency Table: Q1a. Methane capturing

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Methane capturing	6	100.0	100.0	100.0

Frequency Table: Q1a. Diversion

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Diversion	1	16.7	100.0	100.0
Missing	99999	5	83.3		
Total		6	100.0		

2. Do you capture your methane gas?

Statistics

N	Valid	35
	Missing	2

Frequency Table

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	26	70.3	74.3	74.3
	Yes	9	24.3	25.7	100.0
	Total	35	94.6	100.0	
Missing	999	2	5.4		
Total		37	100.0		

2a. [If yes] Is it used to generate electricity?

Statistics

N	Valid	8
	Missing	1

Frequency Table

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	5	55.6	62.5	62.5
	Yes	3	33.3	37.5	100.0
	Total	8	88.9	100.0	
Missing	999	1	11.1		
Total		9	100.0		

[If Q1 is yes]

3. Why did you choose to implement a food waste management system?

Statistics

N	Valid	6
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
1) 25% of landfills are food waste in Iowa, waste of nutrients; 2) Want to reduce methane released into environment; 3) High demand from public to do something about food waste	1	16.7	16.7	16.7
Alternative to landfilling	1	16.7	16.7	33.3
Climate change	1	16.7	16.7	50.0
Reduce food waste	1	16.7	16.7	66.7
Taking useful organics out of the landfill	1	16.7	16.7	83.3
To encourage food waste reduction	1	16.7	16.7	100.0
Total	6	100.0	100.0	

4. Please describe your food waste management system.

Statistics

N	Valid	6
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
1) Educational programs about residential backyard composting; 2) Sell compost bins; 3) School educational programs	1	16.7	16.7	16.7
1) Local student granted money to do waste reduction research; 2) All 14 schools compost; 3) New facility built for composting using anaerobic digestion; 4) Private haulers for large generators; 5) Public can combine yard and food waste	1	16.7	16.7	33.3
1) Outreach to public to reduce waste at home; 2) Composting at landfill; 3) Outreach to local grocery stores and restaurants; 4) \$20 coupons to public to use at local retailers to buy a compost bin	1	16.7	16.7	50.0
1) Pilot program for commercial food scraps recycling; 2) Residents can put their food waste with their yard waste at the curb, but they can't include meat and dairy because of odor	1	16.7	16.7	66.7
Collect only organic food waste in curbside pick-up	1	16.7	16.7	83.3
Pre-consumer food waste composting	1	16.7	16.7	100.0

Total	6	100.0	100.0
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5. How long have you used the system?

Statistics

N	Valid	6
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1) Educational outreach for 10 years; 2) Composting since 2007; 3) Supplementing programs over the past year	1	16.7	16.7	16.7
Valid 1) Pilot program since 2012; 2) Composting since early 90's	1	16.7	16.7	33.3
10 years	1	16.7	16.7	50.0
10+ years	1	16.7	16.7	66.7
15+ years	1	16.7	16.7	83.3
2006.	1	16.7	16.7	100.0
Total	6	100.0	100.0	

5a. What did you do with your food waste before this system was put in place?

Statistics

N	Valid	6
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Landfilled	6	100.0	100.0	100.0

6. Who within your organization helped you put your system together?

Statistics

N	Valid	6
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	16.7	16.7	16.7
	1	16.7	16.7	33.3
	1	16.7	16.7	50.0
	1	16.7	16.7	66.7
	1	16.7	16.7	83.3
	1	16.7	16.7	100.0
Total	6	100.0	100.0	

7. Who outside your organization helped you put your system together?

Statistics

N	Valid	6
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	16.7	16.7	16.7
	1	16.7	16.7	33.3
	1	16.7	16.7	50.0
	1	16.7	16.7	66.7
	1	16.7	16.7	83.3
	1	16.7	16.7	100.0
Total	6	100.0	100.0	

8. What obstacles did you have to overcome? How did you address those obstacles?

Statistics

		Y-Q8. What obstacles did you have to overcome?	Y-Q8a. How did you address these obstacles?
N	Valid	6	6
	Missing	0	0

Frequency Table: Y-Q8. What obstacles did you have to overcome?

	Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	1) Collecting rain water and not letting it run off and contaminate; 2) Transportation	1	16.7	16.7	16.7
	1) Cost; 2) State; 3) DNR	1	16.7	16.7	33.3
	1) Couldn't pick "favorites" with haulers, had to open it up to everyone; 2) Getting organizations to realize that food waste is a problem	1	16.7	16.7	50.0
	1) Long permitting process (14 months); 2) Time for internal staff	1	16.7	16.7	66.7
	1) Transportation; 2) Public education	1	16.7	16.7	83.3
	None	1	16.7	16.7	100.0
Total	6	100.0	100.0		

Frequency Table: Y-Q8a. How did you address these obstacles?

	Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	1) Added staff; 2) Working with haulers and improving relationships with them	1	16.7	16.7	16.7
	Collecting water under the compost in a pond	1	16.7	16.7	33.3
	Making people more aware of how they can reduce food waste	1	16.7	16.7	50.0
	Outreach	1	16.7	16.7	66.7
		1	16.7	16.7	83.3

Reduce "yuck" factor	1	16.7	16.7	100.0
Total	6	100.0	100.0	

9. Were there any rules or regulations you had to follow when implementing your food waste management system?

Statistics

N	Valid	6
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
No	2	33.3	33.3	33.3
Valid Yes	4	66.7	66.7	100.0
Total	6	100.0	100.0	

9a. [If yes] Please explain the type of rules/regulations.

Statistics

N	Valid	4
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Increasing permit for maximum number of yards	1	25.0	25.0	25.0
Permit modified	2	50.0	50.0	75.0
Valid Specialized containers for waste	1	25.0	25.0	100.0
Total	4	100.0	100.0	

9b. [If yes] Who was the governing body of those rules/regulations?

Statistics

N	Valid	4
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
City	2	50.0	50.0	50.0
Valid DNR	2	50.0	50.0	100.0
Total	4	100.0	100.0	

10. What other systems/approaches did you consider? What are the pros and cons of the alternative systems?

Statistics

	Y-Q10. What other systems did you consider?	Y-Q10a. What were the pros/cons of the alternative system?
N	Valid	6
	Missing	0

Frequency Table: Y-Q10. What other systems did you consider?

	Frequency	Percent	Valid Percent	Cumulative Percent
Couldn't do a lot with cap on food waste but implemented a lot more when cap was lifted	1	16.7	16.7	16.7
Done everything they have considered	1	16.7	16.7	33.3
Valid More advanced technologies like covered piles that are in a controlled environment and anaerobic digestion	1	16.7	16.7	50.0
None	2	33.3	33.3	83.3
Nothing	1	16.7	16.7	100.0
Total	6	100.0	100.0	

Frequency Table: Y-Q10a. What were the pros/cons of the alternative system?

	Frequency	Percent	Valid Percent	Cumulative Percent
	3	50.0	50.0	50.0
Better without the cap	1	16.7	16.7	66.7
n/a	1	16.7	16.7	83.3
Valid Too expensive but more effective and environmentally friendly	1	16.7	16.7	100.0
Total	6	100.0	100.0	

11. Are there any other systems or approaches that you didn't consider initially, but you may in the future? What are the pros and cons of those systems?

Statistics

		Y-Q11. Are there any systems you'd consider in the future?	Y-Q11a. What are the pros/cons of those systems?
N	Valid	6	6
	Missing	0	0

Frequency Table: Y-Q11. Are there any systems you'd consider in the future?

	Frequency	Percent	Valid Percent	Cumulative Percent
1) Wet and dry collections; 2) Anaerobic digestion	1	16.7	16.7	16.7
Different types of composting such as in vessel	1	16.7	16.7	33.3
Finding use for the methane gas	1	16.7	16.7	50.0
Valid More advanced technologies	1	16.7	16.7	66.7
Pilot program for full-fledge organic composting	1	16.7	16.7	83.3
University fellowship is studying the consumer base and local food systems	1	16.7	16.7	100.0
Total	6	100.0	100.0	

Frequency Table: Y-Q11a. What are the pros/cons of those systems?

	Frequency	Percent	Valid Percent	Cumulative Percent
1) More expensive; 2) Can compost year round`	1	16.7	16.7	16.7
Cost	1	16.7	16.7	33.3
n/a	1	16.7	16.7	50.0
Valid Pro would be not wasting the methane gas	1	16.7	16.7	66.7
Too expensive	1	16.7	16.7	83.3
Very effective	1	16.7	16.7	100.0
Total	6	100.0	100.0	

12. What are the main reasons you settled on the system you are using?

Statistics

N	Valid	6
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
1) Simplest; 2) Less equipment intensive	1	16.7	16.7	16.7
Easiest and cheapest alternative	1	16.7	16.7	33.3
Valid Easily integrated	1	16.7	16.7	50.0
No cost and easy	1	16.7	16.7	66.7
Waste reduction	1	16.7	16.7	83.3
what consumers wanted	1	16.7	16.7	100.0
Total	6	100.0	100.0	

13. What are the strengths of your system?

Statistics

N	Valid	6
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1) Fool proof from operations standpoint	1	16.7	16.7	16.7
1) Mature system	1	16.7	16.7	33.3
Valid 1) Utilizing resources; 2) Break-even for businesses to haul	1	16.7	16.7	50.0
Facility is already set-up to hand a lot of volume	1	16.7	16.7	66.7
No cost	1	16.7	16.7	83.3
Not much odor or varmint problems	1	16.7	16.7	100.0
Total	6	100.0	100.0	

14. What are the weaknesses of your system?

Statistics

N	Valid	6
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Climate impact issues; It's voluntary not mandatory	1	16.7	16.7	16.7
Dependent on temperature	1	16.7	16.7	33.3
Exposure to air, odor	1	16.7	16.7	50.0
Valid Lack of city staff time for outreach	1	16.7	16.7	66.7
Not as effective	1	16.7	16.7	83.3
Public knowledge	1	16.7	16.7	100.0
Total	6	100.0	100.0	

15. Is your food waste management system a net cost or a net savings to your organization?

Statistics

N	Valid	6
	Missing	0

Frequency Table

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Cost	4	66.7	66.7	66.7
	Savings	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

15a. [If savings] Can you put a dollar figure to that?

Statistics

N	Valid	2
	Missing	0

Frequency Table

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	2	100.0	100.0	100.0

15b. [If savings] Where does the savings occur?

Statistics

N	Valid	2
	Missing	0

Frequency Table

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1) Environmentally; 2) Long-term landfill savings in not having to build more landfill cells which is very costly	1	50.0	50.0	50.0
	Disposal cost	1	50.0	50.0	100.0
	Total	2	100.0	100.0	

16. What are your future plans for your system?

Statistics

N	Valid	6
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1) Single stream recycling; 2) Wet/dry collection systems	1	16.7	16.7	16.7
Valid 1) Targeting larger organizations to recycle their food waste; 2) More advanced technologies; 3) Site planning overall to increase efficiency and flow	1	16.7	16.7	33.3
Valid In-vessel composting	1	16.7	16.7	50.0
Valid Mandated for public and private sectors	1	16.7	16.7	66.7
Valid Pilot program for full-fledge composting	1	16.7	16.7	83.3
Valid Utilizing the methane gas	1	16.7	16.7	100.0
Total	6	100.0	100.0	

17. If you had to do it all over again, would you?

Statistics

N	Valid	6
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	6	100.0	100.0	100.0

17a. [If yes] Why?

Statistics

N	Valid	6
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	Effective in changing the social culture, best use of the materials, thinking sustainability and environmental impact	1	16.7	16.7	16.7
	Food waste reduction, working together	1	16.7	16.7	33.3
	Just getting started	1	16.7	16.7	50.0
	Reduce food waste	2	33.3	33.3	83.3
	Very successful over time, once it got momentum it took off quickly, businesses realized that even if it is costly at first it is the right thing to do environmentally	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

17b. [If no] Why not?

Not applicable.

18. Would you recommend this system to your peers?

Statistics

N	Valid	6
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	6	100.0	100.0	100.0

19. On a scale of 0 to 4 with 0 being not at all satisfied and 4 being very satisfied, how satisfied are you with your system overall?

Statistics

N	Valid	6
	Missing	0
Mean		3.67
Sum		22

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 3	2	33.3	33.3	33.3
Valid 4	4	66.7	66.7	100.0
Total	6	100.0	100.0	

[If Q1 is no]

3. What does your organization currently do with your food waste?

Statistics

N	Valid	31
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Landfilled	31	100.0	100.0	100.0

4. On a scale of 0 to 4 with 0 being not at all significant and 4 being very significant, how significant do you think the food waste problem is for your organization?

Statistics

N	Valid	31
	Missing	0
Mean		1.26
Sum		39

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 0	8	25.8	25.8	25.8
1	11	35.5	35.5	61.3
2	9	29.0	29.0	90.3
3	2	6.5	6.5	96.8
4	1	3.2	3.2	100.0
Total	31	100.0	100.0	

5. Would you say you are very familiar, somewhat familiar, or not at all familiar with food waste management systems or techniques?

Statistics

N	Valid	31
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Not at all familiar	8	25.8	25.8	25.8
Somewhat familiar	16	51.6	51.6	77.4
Very familiar	7	22.6	22.6	100.0
Total	31	100.0	100.0	

[If very or somewhat familiar]

6. What systems are you familiar with?

Statistics

	N-Q6Composting	N-Q6Anarobic and aerobic digestion	N-Q6Other
N	Valid	23	23
	Missing	0	0

Frequency Table: N-Q6Composting

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Composting	1	4.3	4.3	4.3
Total	22	95.7	95.7	100.0
	23	100.0	100.0	

Frequency Table: N-Q6Anaerobic and aerobic digestion

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Anaerobic and aerobic digestion	20	87.0	87.0	87.0
Total	3	13.0	13.0	100.0
	23	100.0	100.0	

Frequency Table: N-Q6Other

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid John Deere has been using biodegradable cups and plates.	22	95.7	95.7	95.7
Total	1	4.3	4.3	100.0
	23	100.0	100.0	

7. How did you learn about them?

Statistics

N	Valid	23
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1) Been in the business; 2) Conferences	1	4.3	4.3	4.3
1) Classes; 2) Been in the business	1	4.3	4.3	8.7
1) Conferences; 2) Magazine articles	1	4.3	4.3	13.0
1) Conferences; 2) Visiting other landfills	1	4.3	4.3	17.4
1) Internet; 2) Magazines	1	4.3	4.3	21.7

1) National trade organizations; 2) DNR	1	4.3	4.3	26.1
1) Seminars; 2) Farming	1	4.3	4.3	30.4
16 years in the business	1	4.3	4.3	34.8
Been in the business for years	1	4.3	4.3	39.1
Being in the business	2	8.7	8.7	47.8
Being in the business for 30 years	1	4.3	4.3	52.2
Being in the business for MANY years	1	4.3	4.3	56.5
Composted before the machine broke	1	4.3	4.3	60.9
Conferences	1	4.3	4.3	65.2
ECICOG (Eastern Central Iowa Council of Governments)	3	13.0	13.0	78.3
Had composting in place for awhile	1	4.3	4.3	82.6
Research	1	4.3	4.3	87.0
Trade magazines	1	4.3	4.3	91.3
Used to have a compost program in place	1	4.3	4.3	95.7
Word of mouth	1	4.3	4.3	100.0
Total	23	100.0	100.0	

8. What do you like about them?

Statistics

N	Valid	23
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1) Good opportunity; 2) More public knowledge about food waste reduction	1	4.3	4.3	4.3

Composting can yield a useful product if used on a "recipe" basis, control the inputs to generate useful material	1	4.3	4.3	8.7
Composting like organic breakdown does work, there is potential for on-site management by large food processors	1	4.3	4.3	13.0
Everything	1	4.3	4.3	17.4
Good thing to do	1	4.3	4.3	21.7
Good thing to do for environment	2	8.7	8.7	30.4
Good way to be green	1	4.3	4.3	34.8
Good way to handle waste and turn into usable product	1	4.3	4.3	39.1
Good way to reuse resources	1	4.3	4.3	43.5
Idea of reducing food waste	1	4.3	4.3	47.8
Like the concept of composting	1	4.3	4.3	52.2
Mixing with organics seems like a viable option	1	4.3	4.3	56.5
More space in landfill	1	4.3	4.3	60.9
n/a	1	4.3	4.3	65.2
No feeling one way or the other	1	4.3	4.3	69.6
Not much	1	4.3	4.3	73.9
Nothing	3	13.0	13.0	87.0
Nothing in particular	1	4.3	4.3	91.3
Reducing food waste	1	4.3	4.3	95.7
Very effective, used to service all the HyVee's in Iowa	1	4.3	4.3	100.0
Total	23	100.0	100.0	

8a. What do you dislike about them?

Statistics

N	Valid	23
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
1) Approaches are temperamental, takes time and can create odor; 2) Cost prohibitive, especially for small/rural areas	1	4.3	4.3	4.3
1) Collection problems; 2) Expensive	1	4.3	4.3	8.7
1) Cost of transportation; 2) Not sure food waste reduction programs even reduce our carbon footprint	1	4.3	4.3	13.0
1) Cost; 2) Odor problem	1	4.3	4.3	17.4
1) DNR regulations are burdensome; 2) Too expensive	1	4.3	4.3	21.7
Valid 1) Low landfill fees so people don't really want to reduce food waste if it will raise fees; 2) Hard to convince people to take advantage of the opportunity to reduce food waste	1	4.3	4.3	26.1
1) Too small to generate enough food waste to be effective; 2) Too expensive	1	4.3	4.3	30.4
Don't have the man power	1	4.3	4.3	34.8
Don't seem to have a big enough market to implement	1	4.3	4.3	39.1
If composting isn't implemented correctly odor and varmints can become issues, well planning is needed	1	4.3	4.3	43.5

Lack of public knowledge	1	4.3	4.3	47.8
Limited resources	1	4.3	4.3	52.2
Located very close to the city and got some odor issues and the DNR got involved	1	4.3	4.3	56.5
n/a	1	4.3	4.3	60.9
Need enough food waste to do it	1	4.3	4.3	65.2
No collection program is workable on a local level, mostly because of Iowa weather, in the summer collection is too hard because of heat and too hard in winter because of freezing temps	1	4.3	4.3	69.6
No feeling one way or the other	1	4.3	4.3	73.9
Nothing in particular	1	4.3	4.3	78.3
Odor	1	4.3	4.3	82.6
Requires extra space	1	4.3	4.3	87.0
Too small and composting is too expensive	1	4.3	4.3	91.3
Very expensive to fix a broken composter	1	4.3	4.3	95.7
Very extensive process	1	4.3	4.3	100.0
Total	23	100.0	100.0	

9. What obstacles would you have to overcome to implement a system?

Statistics

N	Valid	23
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
1) Collection; 2) Delivery	1	4.3	4.3	4.3
1) Cost; 2) Collection issues; 3) Market for end product	1	4.3	4.3	8.7
1) Cost; 2) How much organic material is in the waste	1	4.3	4.3	13.0
1) Don't have man power or managing resources; 2) Cost	1	4.3	4.3	17.4
1) Financing; 2) DNR regulations	1	4.3	4.3	21.7
1) Financing; 2) Site, location	1	4.3	4.3	26.1
1) Lack of public interest; 2) Potentially higher fees; 3) Changing infrastructure for food waste generators	1	4.3	4.3	30.4
1) Location, not too close to the city; 2) Odor; 3) getting Board of Directors to agree	1	4.3	4.3	34.8
1) Low budget; 2) People in area had bad experience with a compost site, made area smell really bad and people got sick	1	4.3	4.3	39.1
1) No capabilities being so small; 2) Too expensive; 3) Space	1	4.3	4.3	43.5
1) Public perception; 2) Personnel resources; 3) Finances	1	4.3	4.3	47.8

1) Small-scale landfill without a lot of resources; 2) Getting the public on board	1	4.3	4.3	52.2
1) Space; 2) Rural area problem/economics of collection, getting enough quantity of a good mix to approach on a "recipe" basis, need enough to not generate odors and high quality	1	4.3	4.3	56.5
1) Space; 2) Separating waste; 3) Transportation	1	4.3	4.3	60.9
1) Would have to get a license; 2) Have to partner with small restaurants (only food waste producers on large scale in town); 3) Transportation costs	1	4.3	4.3	65.2
Cost	2	8.7	8.7	73.9
Figuring out how and when	1	4.3	4.3	78.3
Have to have the right mix of inorganic and organic materials in the screening process	1	4.3	4.3	82.6
Need extra space	1	4.3	4.3	87.0
Need more food waste	1	4.3	4.3	91.3
Transportation	1	4.3	4.3	95.7
Transportation, large cost	1	4.3	4.3	100.0
Total	23	100.0	100.0	

10. Do you have any future plans to implement a system?

Statistics

N	Valid	22
	Missing	1

Frequency Table

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	19	82.6	86.4	86.4
	Thinking about it, but no plans	2	8.7	9.1	95.5
	Yes	1	4.3	4.5	100.0
	Total	22	95.7	100.0	
Missing	99999	1	4.3		
Total		23	100.0		

[If yes]

11. What systems are you considering and why?

Statistics

N	Valid	1
	Missing	0

Frequency Table

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Composting - Getting an organic composting permit	1	100.0	100.0	100.0

12. How soon do you plan to implement your system?

Statistics

N	Valid	1
	Missing	0

Frequency Table

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Within the next 2 years	1	100.0	100.0	100.0

13. What information would you need to collect to make a decision?

Statistics

N	Valid	1
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 3rd parties success at food waste management, such as, ISU's composting system, Ames has a program turning residential waste into energy, Private-for-profit vendors that for example take waste from restaurants to compost	1	100.0	100.0	100.0

14. What type of help would you need? Where would you go to get help?

Statistics

N	Valid	1
	Missing	0

Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Collecting and aggregating of material	1	100.0	100.0	100.0