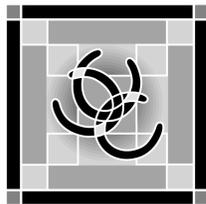


Strategies to Reduce & Recycle Solid Waste in Grocery Stores

Prepared for the

Washington County Department of Public Health & Environment

March 2003



J L TAITT
and associates inc
WE TURN GARBAGE INTO GOLD™

STRATEGIES TO REDUCE & RECYCLE SOLID WASTE IN GROCERY STORES

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STRATEGIES TO REDUCE & RECYCLE SOLID WASTE IN GROCERY STORES

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EXECUTIVE SUMMARY

Washington County, located on the eastern edge of Minnesota, is one of seven Twin Cities metropolitan area counties. The County has a diverse economy with a strong commercial and manufacturing base. The City of Stillwater, along the St. Croix River, serves as the County seat. Washington County is comprised of 423 square miles and is home to 201,130 residents. The County projects that its population will grow to over 288,000 by 2020.

Minnesota state law requires metropolitan counties to plan and implement activities to meet the State's policy for solid waste management. In February 1999, Washington County's Board of Commissioners adopted a Regional/County Solid Waste Management Master Plan. The Plan authorized the Washington County Department of Public Health and Environment to:

1. Conduct a comprehensive research focus on reduction, recycling and management of solid waste in the grocery industry in 2002.
2. Establish a pilot project to identify barriers and solutions for increasing reduction, recycling and nonMSW management in the grocery industry and implement solutions.

The purpose of this project was to identify barriers and opportunities for increasing waste reduction and recycling in grocery stores, develop solutions and implement these solutions in demonstration projects. The scope of the project was to obtain participation from two grocery stores located in Washington County and:

1. Evaluate the stores' current solid waste management activities and conduct research on alternatives.
2. Develop recommendations to reduce and recycle various solid wastes generated by grocery stores.

National grocery industry research suggests that the composition of the solid waste stream in a grocery store is significantly high in organic waste (69 to 89 percent) comprised of food, fiber (paper and wood) and floral waste. Therefore, organic waste management strategies offer the greatest opportunities to divert the largest volume of solid waste generated by grocery stores from the waste stream. It is recommended that emphasis be put on developing and implementing organic waste management strategies for grocery stores in the Twin Cities metropolitan area.

Current solid waste generation, recycling, waste reduction and disposal activities were evaluated at two grocery stores located in Washington County: (1) Kowalski's Market in Woodbury; and (2) Rainbow Foods in Oakdale. An economic analysis was conducted using data from the two stores to explore the recovery of source separated organic material for composting. The analysis included a 34.2% County Environmental Charge

collected by haulers on their customers' trash bills. The County Environmental Charge was recently approved by Washington County and will be effective April 2003.

The following steps are recommended to assist grocery stores in the management of solid waste:

1. Conduct more research on the feasibility of expanding the following organic waste management strategies in the Twin Cities metropolitan area:
 - a. Composting
 - b. Food rescue
 - c. Manufacturing livestock feed

The type of organic waste managed by each strategy includes:

Organic Waste Management Strategy	Type of Organic Waste Managed
Composting	Food Fiber (paper & wood) Floral
Food Rescue	Edible Excess Food
Manufacturing Livestock Feed	Food Waste

2. Create an economic incentive for grocery stores to recover organic waste from their waste stream:
 - a. For counties that have not done this, increase the cost to manage solid waste as trash by adding to the state solid waste management tax (17%) a hauler collected county environmental charge that is directly related to the volume of trash generated.
 - b. Support the exemption of organic waste collected and managed from grocery stores from the following hauler collected charges:
 - State solid waste management tax (17%)
 - County environmental charge

3. Develop case studies of organic waste management strategies in grocery stores by providing technical assistance to grocery stores that currently have the economic incentive to recover organic waste. Use the case study information to develop a technical assistance package for grocery stores in the Twin Cities metropolitan area.

I. PROJECT BACKGROUND

Washington County, located on the eastern edge of Minnesota, is one of seven Twin Cities metropolitan area counties. The County has a diverse economy with a strong trade and manufacturing base. The City of Stillwater, along the St. Croix River, serves as the County seat. Washington County is comprised of 423 square miles and is home to 201,130 residents. The County projects that its population will grow to over 288,000 by 2020.

Minnesota state law requires metropolitan counties to plan and implement activities to meet the State's policy for solid waste management. In February 1999, Washington County's Board of Commissioners adopted a Regional/County Solid Waste Management Master Plan. The Plan authorized the Washington County Department of Public Health and Environment to:

1. Conduct a comprehensive research focus on reduction, recycling and management of solid waste in the grocery industry in 2002.
2. Establish a pilot project to identify barriers and solutions for increasing reduction, recycling and nonMSW management in the grocery industry and implement solutions.

In December 2001, the County retained the services of JL Taitt & Associates (Contractor) to identify barriers and opportunities for increasing waste reduction and recycling in grocery stores, develop solutions and implement these solutions in demonstration projects. The scope of the project was to obtain participation from two grocery stores located in Washington County and:

1. Evaluate the stores' current solid waste management activities and conduct research on alternatives.
2. Develop recommendations to reduce and recycle various solid wastes generated by grocery stores.
3. Report on project outcomes.

A summary of the Contractor's work accomplished in 2002 is provided in this report.

II. NATIONAL AND LOCAL GROCERY INDUSTRY RESEARCH

The first phase of the project was to conduct national and local research of the grocery industry and to identify barriers and opportunities in implementing waste reduction and recycling strategies. Internet, library and telephone research was conducted to identify:

1. The composition of the solid waste stream generated in a grocery store.
2. How and where solid waste is generated in a grocery store.
3. Strategies to reduce and recycle solid waste in grocery stores.

Composition of the Solid Waste Stream Generated in a Grocery Store

Research was conducted to determine the composition of the solid waste stream generated in a grocery store, and the following waste composition data was identified.

Portland Metro Data

The Portland Metro, a regional government that serves more than 1.3 million residents in Clackamas, Multnomah and Washington counties, and the 24 cities in the Portland, Oregon, metropolitan area estimates that:

1. The solid waste generated at medium-to-large grocery stores is composed of:

Food waste	59%
Paper packaging	19%
Other paper	6%
Other packaging	6%
Wood	5%
Other	5%

Source: Five Simple Steps for Grocery Waste Reduction, Metro Regional Government, 1988

2. Grocery stores are responsible for approximately 14 percent of organic waste produced in the Portland Metro region.

Source: Organic Waste Diversion Study, Metro Regional Government, October 2000.

California Integrated Waste Management Board Study

In 1999, the California Integrated Waste Management Board conducted a statewide waste characterization study. The study indicates that the composition of retail food store waste is estimated to be:

Food waste	40%
Paper ¹	28%
Plant waste ²	1%
Glass	2%
Metal	5%
Plastic	11%
Construction & demolition	11%
Special waste (bulky items)	1%
Other	1%

¹Paper includes uncoated corrugated cardboard, paper bags, newspaper, ledger paper, computer paper, magazines and catalogs, phone books and directories, other miscellaneous paper and composite paper.

²Plant waste includes leaves, grass, trimmings, branches and stumps.

Source: California Statewide Waste Characterization Study, December 1999

Two Types of Solid Waste in Grocery Stores

The solid waste composition data was grouped into two general types of waste:

1. Organic waste comprised of:
 - Food waste
 - Fiber waste (e.g., paper and wood)
 - Floral waste

2. Non-organic waste comprised of:
 - Glass, metal and plastic waste
 - Construction and demolition waste
 - Special and other waste (e.g., bulky items)

When grouped in this manner, the data suggests that the composition of a grocery store's solid waste stream is approximately:

1. Sixty-nine (69) to eighty-nine (89) percent organic waste.
2. Eleven (11) to thirty-one (31) percent non-organic waste.

How and Where Solid Waste is Generated in a Grocery Store

The research suggests that each department in a grocery store generates its own unique solid waste stream, and many departments in a grocery store generate a waste stream with a large organic component. Some organic waste streams can be kept separate and

relatively uncontaminated such as in the produce department. Other departments, such as deli and meat, generate organic waste streams contaminated with other types of waste such as paper and plastic packaging.

The Portland Metro Organic Waste Diversion Study (2000) states that organic-producing operations can be identified in six grocery store departments including bakery, deli, floral, meat, packaged goods and produce. The average volume of waste generated per day for five of the departments is indicated in the table below. Packaged goods are not included because it is difficult to estimate the amount of waste generated from this department.

Grocery Store Departments Average Daily Waste Volume

Department	Average Daily Volume of Waste Generated (Gallons)
Bakery	161 – 192
Deli	193 – 266
Floral	43 – 49
Meat	123 – 191
Produce	203 – 265

Source: Organic Waste Diversion Study, Metro Regional Government, October 2000.

The Portland Metro Organic Waste Diversion Study (2000) describes the solid waste generated for each of the six grocery departments:

1. **Bakery departments** create very little waste in the production phase since many bakery products are produced offsite. Bakeries usually overproduce to keep shelves stocked with fresh baked goods, and excess products are discarded at the end of the day or after the expiration date.
2. **Deli departments** generate waste consisting of food preparation waste, post-consumer waste including uneaten food, paper and plastic and prepared food left over at the end of the day.
3. **Floral departments** are small areas in most stores unless there is a garden center. Most stores discard a minimal amount of plant cuttings and product.
4. **Meat departments** produce bones, fat and meat scraps as well as contaminated plastic and paper packaging.
5. **Packaged goods departments** produce large volumes of cardboard and some organic waste, but it is not easy to estimate daily volumes of waste.

6. **Produce departments** have bruised and spoiled fruits and vegetables and trim waste that is usually kept separate from other waste streams until it is compacted.

Strategies to Reduce and Recycle Solid Waste in Grocery Stores

Based on the research, the following organic and non-organic strategies listed below were identified for managing the various types of solid waste generated by grocery stores.

1. Organic waste strategies
 - Composting
 - Food rescue
 - Manufacturing livestock feed
2. Non-organic waste strategies
 - Recycling
 - Reusable transport packaging

A brief description of each strategy follows, including a summary of the opportunities and barriers grocery stores face in implementing them. A full description of each strategy including case studies and bibliographies is provided in Appendix A.

1. Organic Waste Strategies

Organic waste strategies in grocery stores include composting, food rescue and manufacturing livestock feed. Many grocery stores have one or more of these strategies in place to manage parts of their organic waste stream. The type of organic waste managed by each strategy is provided below.

Organic Waste Management Strategy	Type of Organic Waste Managed
Composting	Food Fiber (paper & wood) Floral
Food Rescue	Edible Excess Food
Manufacturing Livestock Feed	Food Waste

Composting

Recovering organic waste for composting is feasible for grocery stores since they generate a substantial amount of organic waste. Composting facilities equipped to receive organic waste from grocery stores and a strong transportation system between composting facilities and grocery stores are required to implement this strategy. While a store might choose to compost on site, this is rare. Most stores send their organic waste off site to a composting facility.

There are many organic waste streams in a grocery store, which can be accepted at a composting facility. These include the organic stream from the produce department that consists of bruised and spoiled fruit and trimmings. Usually, these materials are kept separate until they are transferred to the trash compactor. Another more complicated organic waste stream is from the deli department consisting of food preparation waste, post-consumer waste including uneaten food, paper and plastic and left over food at the end of the day. Both streams could each be mixed with floral waste and fiber waste streams from the grocery store, including wax-coated paper and cardboard.

Opportunities

NRG Processing Solutions (NRG PS) in Dakota County is a composting facility located in the Twin Cities metropolitan area that can accept the wide variety of organic waste generated by grocery stores including food waste products, fiber waste (e.g., paper and wood) and floral waste. NRG PS is exploring methods to recover organic waste from grocery stores in the Twin Cities metropolitan area.

Barriers

The barriers to composting organic waste from grocery stores are listed below. These barriers are described in more detail in Appendix A.

1. **Limited composting facilities** equipped to accept the varied organic waste streams generated in grocery stores.
2. **Lack of information** among grocery store management about the opportunity to compost organic waste and other solid waste reduction and recycling strategies.
3. **No transportation system in place** to transport organic waste from grocery stores to composting facilities.
4. **Limited internal or external space** at grocery stores to store containers to collect organic waste.
5. **Lack of internal collection systems** established in grocery stores to recover the organic fraction from their solid waste stream.

6. **Increased labor costs** to sort contaminants such as plastic packaging from the organic waste stream.
7. **Fear of liability** if there is a problem with the quality of the organic waste that is composted.

Composting Summary

There is significant potential for composting organic waste from grocery stores, but a system needs to be established to address the barriers above. Composting facilities need to be designed and sized to handle the unique organic waste streams from grocery stores. For example, a composting facility may need to manage contaminated paper and/or raw or cooked meat differently than fruit and vegetable wastes. Once appropriate composting facilities have been identified, grocery stores need to develop in-store collection systems to recover organics that meet the requirements of the facilities. Transportation systems need to be developed to transport organic waste from grocery stores to composting facilities.

Food Rescue

Food rescue provides a vital link between surplus food supplies and emergency food assistance while also reducing waste. It is based on the simple concept of picking up safe and edible excess food and delivering it to non-profit agencies serving people in need. The primary focus of food rescue is to redistribute prepared and perishable food.

Opportunities

Twelve Baskets is the only food rescue program that serves the Twin Cities metropolitan area. The program is sponsored by Second Harvest Heartland, a food bank that serves 41 Minnesota counties, including Washington County, and 20 counties in Wisconsin. The program accepts unserved, prepared foods which are properly refrigerated and packaged such as deli, produce, dairy, bakery and canned/dry goods. Twelve Baskets has a donor base of over 520 businesses and serves 61 non-profit agencies in the Twin Cities metropolitan area with five refrigerated trucks and six full time drivers trained and certified as food managers by the State of Minnesota. Businesses that donate food to food rescue programs are protected against liability by the Good Samaritan Law and may benefit from a tax deduction.

Barriers

Twelve Baskets is the only food rescue program within Minnesota's network of food banks that has the infrastructure to redistribute prepared and perishable food in the Twin Cities metropolitan area. In 2001, Twelve Baskets redistributed over 1.25 million pounds of surplus food that would otherwise have been disposed of as food waste. However, at its current recovery capacity, the program estimates that it rescues only about 25 percent of the potential excess prepared and perishable food available in the Twin Cities. Twelve Baskets currently collected from 16 grocery stores in the metropolitan area including one store in Washington County.

Twelve Baskets indicates that there are two main barriers to increasing its capacity for recovery (see Appendix A for detailed descriptions):

1. **Funding** to provide staff, equipment and services to collect additional food and close the gap between surplus food supplies and the needs of non-profit agencies serving people in need.
2. **No donation policies** implemented by some grocery stores in the Twin Cities metropolitan area.

Summary

The opportunity to bridge the gap between surplus food supplies that are discarded in the solid waste stream and non-profit agencies serving people in need is wide open for expansion. Funding options, awareness and education campaigns featuring businesses

successfully donating food and building relationships between donor and recipient organizations are all strategies available to promote food rescue in the Twin Cities metropolitan area.

Manufacturing Livestock Feed

Three types of businesses were identified as having interest in manufacturing livestock feed or feed ingredients from organic grocery store waste: (1) rendering companies; (2) food waste processors; and (3) livestock producers.

1. Rendering Companies

Rendering is the treatment of animal tissue by thermal and/or chemical processes to separate fat from protein and mineral components. In a grocery store, fat and bone trimmings generated in the meat department are oftentimes collected and transported to rendering companies where this waste material is processed into livestock feed ingredients such as fat and protein (e.g., meat and bone meal).

Opportunities

Rendering fat and bone trimmings collected from meat departments is a well established organic waste management practice in the grocery industry. Depending on the volume of material per pick up and the market price for animal fat and protein, rendering companies often paid grocery stores for the economic value of this organic waste material.

Barriers

Over the last three or four years, the market price for livestock protein sources has fallen dramatically and rendering companies serving the Twin Cities metropolitan area have been forced to charge grocery stores transportation fees for picking up fat and bone trimmings.

Rendering Summary

If market prices for finished product do not recover with time, rendering companies may be at risk of losing grocery store customers and fat and bone trimmings from meat departments may enter the waste stream.

2. Food Waste Processors

Food waste processors manufacture livestock feed ingredients from a wide variety of inedible food products such as cookies, dough, cereal, pasta, crackers, bread, bagels and chips.

Opportunities

Endres Processing in Rosemount picks up food waste products in the Twin Cities metropolitan area and processes them into an animal feed ingredient that is registered by

the Department of Agriculture. Food waste products are heat treated, dried to less than 10 percent moisture, ground and screened to particles that are less than 1/10th of an inch. The company processes over 6,500 tons of food waste products per week. Endres Processing currently collects food waste from grocery stores, and its goal is to increase the number of grocery stores it serves in the Twin Cities metropolitan area.

Barriers

The barriers to manufacturing livestock feed ingredients from food waste generated at grocery stores are listed below.

1. **Limited food waste manufacturing facilities** equipped to accept the varied food waste streams generated in grocery stores.
2. **Lack of information** among grocery store management about the opportunity to manufacture livestock feed ingredients from food waste and other solid waste reduction and recycling strategies.
3. **No transportation system in place** to transport food waste from grocery stores to food waste processing facilities.
4. **Limited internal or external space** at grocery stores to store containers to collect food waste.
5. **Lack of internal collection systems** established in grocery stores to recover the food waste fraction from their solid waste stream.

Food Waste Processing Summary

There is significant potential for food waste from grocery stores to be manufactured into livestock feed ingredients, but a system needs to be established to address the barriers above. More information about existing food waste manufacturing facilities is needed and their ability to handle the unique food waste streams from grocery stores. For example, a food waste manufacturing facility may need to manage processed and/or raw or cooked meat differently from fruit and vegetable wastes. Once appropriate food waste manufacturing facilities have been identified, grocery stores need to develop in-store collection systems to recover food waste that meet the requirements of the facilities. Transportation systems need to be developed to transport food waste from grocery stores to food waste processing facilities.

3. Livestock Producers

Livestock producers can use food waste as livestock feed if they have obtained a permit from the Minnesota Board of Animal Health. Two types of permits are available to livestock producers: (1) exempt materials permits; and (2) garbage feeder permits. An

exempt materials permit allows a livestock producer to feed non-meat food waste to livestock. This food waste must have had no possibility of coming into contact with meat for an exempt materials permit holder to accept it. Garbage feeder permit holders can accept meat by-products and other food by-products that may have come into contact with meat.

Typically, livestock producers collect food waste from grocery stores and feed it to hogs. Because grocery stores sell meat and meat products, these livestock producers must hold garbage feeder permits. To help prevent the spread of disease, Minnesota state law requires livestock producers to cook food waste collected from grocery stores at 212°F for 30 minutes. Once a month their facilities and trucks are inspected by the Minnesota Board of Animal Health.

Opportunities

Currently, there are ten livestock producers that hold garbage feeder permits in Minnesota. Many of these farmers collect food waste from Twin Cities metropolitan area grocery stores.

Barriers

Livestock producers have served many Twin Cities metropolitan area grocery stores for a number of years. Hog feeding was especially popular in the early 1990s due to high solid waste disposal costs. However, some grocery stores discontinued this solid waste management practice when solid waste disposal costs lowered.

Non-Organic Waste Strategies

Non-organic waste strategies in grocery stores include recycling of corrugated cardboard, cans, glass and plastic and making the switch to reusable transport packaging. Almost all grocery stores recycle cardboard. Few, if any, retail grocery stores have the economic incentive or the ability to independently make the switch to reusable transport packaging. A brief description of both strategies follow.

Recycling

In 1997, the Food Marketing Institute conducted a national mail survey of its members' environmental practices. A total of 108 companies responded, which in total operate 5,810 grocery stores. The survey found that most or all of the time grocery stores recycle corrugated boxes, wood pallets, aluminum cans and white paper. In August 2001, Washington County surveyed 14 grocery stores and found that all of the stores recycle corrugated cardboard, but the majority of grocery stores do not recycle aluminum, plastic or glass. INFORM (1994) reports that the food and beverage industry received more shipments in corrugated boxes than any other industry in 1993, and nearly 80 percent of grocery retailers have corrugated cardboard recycling programs.

Opportunities

Headley Pratt Consulting (1998) reports that there is a strong economic incentive for stores to recycle corrugated cardboard due to the avoided disposal costs and the revenue generated from recovering it.

A Washington County study (2001) indicates that most grocery stores were interested in recycling additional materials but lacked the resources and time to explore the opportunities. With some assistance, most of the stores would be willing to institute a recycling program to collect aluminum, plastic, glass and paper if it made economic sense.

Barriers

The Grocery Manufacturers of America (1995) suggest that wax-coated corrugated cardboard (e.g., non-recyclable boxes) may comprise as much as 30 percent of a store's total corrugated cardboard stream. Wax-coated corrugated cardboard cannot be recycled in the current recycling system and must be disposed of in the trash. The American Forest and Paper Association indicates that approximately 10 to 15 percent of non-waxed boxes (e.g., recyclable boxes) are inadvertently thrown away at grocery stores because employees are confused about which boxes are and are not recyclable.

Recycling Summary

Headley Pratt Consulting (1998) reports that making changes related to wax-coated corrugated cardboard represents the single biggest area where grocery stores could accrue additional economic benefits due to recycling. Stores could benefit by additional avoided disposal costs and recycling revenue by recovering recyclable corrugated cardboard that currently may be thrown away due to confusion with wax-coated corrugated boxes.

Grocery stores may realize additional economic benefit by recycling more materials such as aluminum, plastic, glass and paper.

Reusable Transport Packaging

Transport packaging waste from grocery stores typically includes corrugated cardboard boxes, pallet wrap, wood pallets and plastic crates. In 1995, Franklin Associates found that from 1990 to 1993 the use of transport packaging by grocery stores increased 15 percent and projected another 15 percent increase from 1993 to 2000. This increase is primarily due to: (1) a widened distribution area as food products are being shipped across the United States and to international markets; and (2) an increase in deliveries of fresh produce requiring the use of more corrugated containers. Even though recovery of transport packaging has also increased, in 1994 it only accounted for about a third of the grocery transport packaging generated (Resources for the Future, 2000).

Opportunities

Headley Pratt Consulting (1998) states that the most significant reuse effort underway in the grocery industry involves replacing wood pallets with reusable plastic pallets. Any economic benefits of such a switch would be minimal at the retail grocery store level. However, it appears that there may be substantial savings at the wholesaler/distributor level.

In June 1997, Bottom Line Consulting, Inc. found that reusable containers have established themselves as the transport container of choice for dairy, bread and soda beverages to retail grocery stores. Fresh produce (fruits and vegetables) stands out as the major opportunity for expanding the use of reusable containers. Any conversion to reusable containers will be driven by the retail grocery chains, and economics will determine if a conversion to reusable containers occurs. The most important factor in considering expanded use of reusable containers is whether the performance benefits (improved pre-cooling efficiency, reduced product damage, longer shelf life and product-handling efficiencies in the store) will place the economics in favor of reusable containers.

Barriers

Supermarket News (October, 1995) states that the majority of manufacturer shipments in the grocery industry still travel on wooden pallets despite growth in the use of pallet rental services and plastic pallets. The cost of plastic pallets is still prohibitive. The grocery store retailer is instead concentrating on improved pallet record-keeping and enhanced warehouse employee training.

Bottom Line Consulting (1997) states that one of the fundamental problems of transporting fresh fruits and vegetables is the wide variety of produce available plus the new and growing segment of pre-packaged products such as salads and prepared vegetables. As a result, the current system of containers is as varied as the products—unwaxed and waxed corrugated, flats, no-lid boxes, closed boxes with many different footprints and pallet loading characteristics.

Reusable Transport Packaging Summary

Bottom Line Consulting (1997) states that realizing full advantages of reusable containers is likely to require total commitment and changeover by the retail grocery industry. Partial conversion to reusable containers will be difficult. This changeover will require new thought processes by both retailers and growers.

III. RECOMMENDATIONS FOR FURTHER STUDY

The research suggests that the composition of the solid waste stream in a grocery store is significantly high in organic waste (69 to 89 percent). Therefore, organic waste management strategies offer the greatest opportunities to divert the largest volume of solid waste generated by grocery stores from the waste stream. It is recommended that emphasis be put on developing and implementing local organic waste management strategies for grocery stores.

The following organic waste management strategies for grocery stores are recommended for further study and consideration for implementation in the Twin Cities metropolitan area:

1. Composting
2. Food rescue
3. Manufacturing livestock feed
 - Rendering
 - Food waste processing
 - Livestock feeding

The type of organic waste managed by each strategy is provided below.

Organic Waste Management Strategy	Type of Organic Waste Managed
Composting	Food Fiber (paper & wood) Floral
Food Rescue	Edible Excess Food
Manufacturing Livestock Feed	Food Waste

Composting

It appears that composting is the strategy that can accommodate the widest variety of organic waste generated by grocery stores (e.g., food, fiber and floral waste). More information is needed to understand:

1. The current and future capacity of composting facilities to serve the Twin Cities metropolitan area.

2. The types of material acceptable and unacceptable for composting.
3. The in-store collection methods for recovering organic waste for composting.
4. The transportation system needed to transport organic waste from grocery stores to composting facilities.
5. The economic cost-benefit analysis for grocery stores to compost organic waste.

Food Rescue

It appears that the opportunity to explore ways to bridge the gap between surplus food supplies that are discarded in the waste stream at grocery stores and non-profit agencies serving people in need is wide open for expansion in the Twin Cities metropolitan area. More information is needed to understand:

1. Funding options to provide services to collect additional food and close the gap between surplus food supplies and the needs of non-profit agencies serving people in need.
2. No donation policies implemented by some grocery stores in the Twin Cities metropolitan area.

Manufacturing Livestock Feed

It appears that manufacturing livestock feed is another potential strategy to manage large volumes of organic waste from grocery stores in the Twin Cities metropolitan area. More information is needed about the capabilities of rendering companies, food waste processors and livestock producers to accept organic waste from grocery stores, including:

1. The current and future capacity to recover organic waste.
2. The types of material acceptable and unacceptable for the various options of manufacturing livestock feed.
3. The in-store collection methods to recover acceptable organic waste.
4. The transportation system required to support the transfer of organic material from grocery stores to rendering companies, food waste processors and livestock producers.
5. The economic cost-benefit analysis for grocery stores to recover their organic waste for livestock feed manufacturers.

IV. POTENTIAL GROCERY STORE PARTICIPANTS

The scope of the project was to obtain participation from two grocery stores located in Washington County and:

1. Evaluate the stores' current solid waste generation, recycling, waste reduction and disposal activities.
2. Assist the stores in developing and implementing best management strategies for waste reduction and recycling.
3. Explore the recovery of organic waste for the production of agricultural compost.
4. Develop recommendations on how these waste reduction and recycling strategies may be implemented in grocery stores throughout the Twin Cities metropolitan area.

Identification of Potential Participants

Three potential grocery stores were identified to participate in the project: (1) Kowalski's Market in Woodbury; (2) Rainbow Foods in Oakdale; and (3) Cub Foods in Forest Lake. A description of the parent company for each store is provided below.

Kowalski's Market

Kowalski's Market is independently owned and operated by Jim and Mary Anne Kowalski. Kowalski's Market started in Minnesota in 1983 with the purchase of a Red Owl store on Grand Avenue in St. Paul. At present there are seven Kowalski's Markets in the St. Paul and Minneapolis area. The company also owns a Cub Foods store in White Bear Township, as well as a central bakery and transportation facility.

The potential participant in the project was Kowalski's Market located in Woodbury. This store is the first Kowalski's Market built from the ground up and opened in August 2000. The store was designed to look like a European village with a glass-walled bakery, three restaurant concepts, a department store-quality gift shop, an educational and meeting area, a full service JUUT Salon Spa and a Natural Path department offering organic and natural foods and homeopathic remedies.

Rainbow Foods

Rainbow Foods is owned by Fleming Companies, Inc. located in Lewisville, Texas. Fleming, founded in 1915, is the #1 distributor of consumables to the United States retail industry that includes supermarkets, convenience stores, supercenters, discount, limited assortment, drug and specialty stores. Fleming operates 68 Rainbow Foods stores in four states including Texas, New Mexico, Wisconsin and Minnesota. Forty-two (42) stores

are located in Minnesota. The potential participant in the project was the Rainbow Foods store located in Oakdale.

Cub Foods

Cub Foods is owned by SuperValu, headquartered in Minneapolis, Minnesota. SuperValu acquired Cub Foods in 1980 when there were five stores in the Twin Cities. Now there are more than 110 Cub Food stores in nine states, principally in the Midwest. Fifty-two (52) stores are located in Minnesota. The potential participant in the project was the Cub Foods store located in Forest Lake.

Invitation to Potential Participants

Three grocery stores were invited to participate in the project. Follow-up meetings were set up with key management personnel. Cub Foods declined the invitation to participate in the project. Kowalski's Market and Rainbow Foods agreed to take the next step which was to evaluate the stores' current solid waste generation, recycling, waste reduction and disposal activities.

V. EVALUATION OF CURRENT SOLID WASTE MANAGEMENT STRATEGIES

The evaluation of current solid waste generation, recycling, waste reduction and disposal activities at Kowalski's Market in Woodbury and Rainbow Foods in Oakdale consisted of on-site visits and interviews with department managers.

On-site visits were conducted using a questionnaire to interview department managers (see Appendix B). A summary of the information collected in each department is provided in Appendix C. Included is the average volume of waste generated per day for seven of the departments and is highlighted in the table below.

Grocery Store Departments Average Daily Waste Volume

Department	Average Daily Volume of Waste Generated (Gallons)
Bakery	185
Dairy & Frozen Food	35
Deli	200
Floral	80
Grocery	60
Meat & Seafood	205
Produce	215

Based on this information, the departments were grouped into the following two categories:

1. Departments producing large amounts of organic waste:
 - Bakery
 - Deli
 - Meat & seafood
 - Produce
2. Departments producing small amounts of organic waste:
 - Dairy & frozen food
 - Floral
 - Grocery

Three common factors were identified in all departments of a grocery store that drive the daily generation and management of waste:

1. Food expiration dates.

2. Damaged products.
3. Transport packaging (e.g., wood pallets, cardboard boxes, shrink wrap).

The stores have implemented the following solid waste management strategies:

1. Food rescue
2. Rendering
3. Cardboard recycling
4. Trash

A brief description of each solid waste management strategy currently implemented follows.

Food Rescue

Every morning and afternoon, department staff check expiration dates on food products. The products that are near expiration are culled and set aside for the food shelf. The food shelf collects donated food on weekdays. On weekends, food that could be donated is discarded in the trash because collection service is not provided by the food shelf. Both stores donate prepared and/or perishable food to the food shelf.

Rendering

Currently, one of the two stores collects fat, bones and trimmings for a rendering company to pick up. Up until two years ago, both stores used this service. One store discontinued this service because of increasing costs.

Reusable Transport Packaging

Both stores receive shipments of general merchandise, such as health and beauty aids, in reusable plastic totes and some products on plastic pallets. The switch to reusable transport packaging has been initiated over time by the grocery stores' suppliers and distributors.

Cardboard Recycling & Trash

Both stores use a stationery compactor to recycle loose cardboard and a self-contained compactor to manage their trash. Both stores dedicate a loading dock bay to each compactor.

VI. ECONOMIC ANALYSIS OF RECOVERING ORGANIC WASTE FOR COMPOSTING IN GROCERY STORES

An economic analysis was conducted to explore the recovery of source separated organic material (SSOM) for composting at Kowalski's Market in Woodbury and Rainbow Foods in Oakdale. The analysis included:

1. Current trash hauling and disposal costs.
2. Current cardboard recycling costs and revenues.
3. Estimated costs to recover organic waste for composting.

To conduct the analysis, the following cost and revenue data were obtained from both stores for the 12-month period May 2001 to April 2002:

1. Trash hauling and disposal costs
 - Haul charges
 - Tip fees
 - Compactor rental fees
 - State tax paid
2. Cardboard recycling costs
 - Haul charges
 - Compactor rental fees
3. Cardboard recycling revenues received

Operational Considerations

The following operational considerations were identified in the economic analysis:

1. The collection system to recover SSOM from grocery stores must minimize the change in daily operations.
2. Loading dock bays and adjacent space in grocery stores are limited and adding more collection equipment for SSOM is not always possible.
3. Transporting SSOM along with bagged trash in one compactor rather than in separate containers appears to be one viable solution.

4. Trash compactors containing loose SSOM and bagged trash would be transported to NRG Processing Solutions (NRG PS) in Dakota County, which is a longer distance to transport than to the Resource Recovery Facility in Newport.
5. Because trash and SSOM originating in Washington County would be transported a greater distance to Dakota County, hauling charges will increase.
6. Additional costs may be incurred to purchase biodegradable bags for the collection of SSOM and to educate and train grocery staff to separate SSOM from trash.
7. Because there is going to be increased hauling and operational costs for the grocery stores, there must be a reduction in cost elsewhere to offset the increase.
8. One way to offset the higher cost of recovering SSOM is to exempt SSOM from the state solid waste management tax.

Cost Components

In addition to the haul charge, tip fee, compactor rental fee and state tax of 17%, the economic analysis includes a 34.2% County Environmental Charge (CEC) recently approved by Washington County. The CEC will be collected by haulers on their customers' trash bills effective April 2003. The CEC will replace a flat fee collected through property tax and will be applied to solid waste management services based on waste volume. The CEC will be exempt from recycling and organic waste management in which organic material is source separated by the generator.

Other costs to implement the SSOM and trash model include additional labor and the possible purchase of biodegradable bags, which are not included in the economic analysis.

Cost Comparisons

Because loading dock bays and adjacent space in grocery stores are limited, cost comparisons were based on a model where SSOM from the grocery stores is collected and transported in the same compactor as bagged trash and hauled to NRG PS. This model has two tax implications:

1. Currently, the Minnesota Department of Revenue has determined that this model does not meet the definition of source separated organics, and this load of material tipped at NRG PS would not be exempt from the state solid waste management tax of 17%.

2. Washington County has determined that this load of material tipped at NRG PS also would not be exempt from the County Environmental Charge.

The following costs were calculated for Kowalski's Market and Rainbow Foods:

1. Actual cost to manage trash in 2002 including the state solid waste management tax (17%).
2. Estimated cost to manage the same volume of trash in 2003 including the state solid waste management tax (17%) and the County Environmental Charge (34.2%).
3. Estimated cost to recover SSOM for composting in 2003 including the state solid waste management tax (17%) but exempt from the County Environmental Charge (34.2%).
4. Estimated cost to recover SSOM for composting in 2003 including the County Environmental Charge (34.2%) but exempt from the state solid waste management tax (17%).
5. Estimated cost to recover SSOM for composting in 2003 exempt from both the state solid waste management tax (17%) and the County Environmental Charge (34.2%).

Conclusions

1. When the state solid waste management tax (17%) is applied to the recovery of SSOM for composting, it costs the grocery store more to compost organic waste than to dispose of organic waste in the trash.
2. An exemption of only the 17% state solid waste management tax does not sufficiently offset the increased costs of the collection system to recover SSOM from grocery stores.
3. An exemption of both the solid waste management tax and a county environmental charge is required to establish an economic incentive to implement a collection system for SSOM in grocery stores and transport it to NRG PS for composting.

VII. NEXT STEPS

The following next steps are recommended to assist grocery stores in the management of organic waste in the solid waste they generate:

Conduct More Research

Conduct more research on the feasibility of expanding the following organic waste management strategies in the Twin Cities metropolitan area:

1. Composting
2. Food rescue
3. Manufacturing livestock feed
 - Rendering
 - Food waste processing
 - Livestock feeding

The type of organic waste managed by each strategy includes:

Organic Waste Management Strategy	Type of Organic Waste Managed
Composting	Food Fiber (paper & wood) Floral
Food Rescue	Edible Excess Food
Manufacturing Livestock Feed	Food Waste

For each organic waste management strategy, more information is needed to understand:

1. The current and future capacity to serve the Twin Cities metropolitan area.
2. The types of organic waste accepted and the types of materials that are unacceptable.
3. The in-store collection methods for recovering organic waste.

4. The transportation system needed to transport organic waste from grocery stores to organic waste management facilities.
5. The economic cost-benefit analysis for grocery stores to recover organic waste.

Create an Economic Incentive

Create an economic incentive for grocery stores to recover organic waste from their waste stream:

1. For counties that have not done this, increase the cost to manage solid waste as trash by adding to the state solid waste management tax (17%) a hauler collected county environmental charge that is directly related to the volume of trash generated.
2. Support the exemption of organic waste collected and managed from grocery stores from the following hauler collected charges:
 - State solid waste management tax (17%).
 - County environmental charge.

Develop Case Studies

Develop case studies of organic waste management strategies in grocery stores by providing technical assistance to grocery stores that currently have the economic incentive to recover organic waste. Use the case study information to develop a technical assistance package for grocery stores in the Twin Cities metropolitan area.

APPENDIX A

National and Local Grocery Industry Research on Strategies to Reduce and Recycle Waste in Grocery Stores

The national and local grocery industry research on strategies to reduce and recycle waste in grocery stores are organized as:

1. Organic waste strategies
 - Composting
 - Food rescue
 - Manufacturing livestock feed
2. Non-organic waste strategies
 - Reusable transport packaging
 - Recycling

ORGANIC WASTE STRATEGIES

Many departments in a grocery store generate an organic waste stream. Some organic streams are kept separate and uncontaminated while others include wet or greasy paper or are mixed with the other waste streams in the store.

Operations in six departments in grocery stores produce organic waste streams. The amounts below are estimates from the Portland (OR) Metro Regional Government 2000 Organic Waste Diversion Study for an average grocery store.

Bakery Departments create very little waste in the production phase and many bakery products are made offsite. Bakeries usually overproduce to keep shelves stocked and excess product is discarded at the end of the day or after the expiration date. About 175 gallons of bakery products are typically discarded each day.

Deli Departments generate approximately 230 gallons of waste per day consisting of food preparation waste, post consumer waste including uneaten food, paper and plastic, and prepared food left over at the end of the day.

Dry Goods Departments produce some organic waste, but the volume and character of the waste could not be determined.

Floral Departments are small areas in most stores unless there is a garden center. Most stores discard a minimal amount of plant cuttings and product; usually less than 45 gallons per day for an average store.

Meat Departments produce bones, fat and meat scraps as well as contaminated plastic and paper packaging. An average meat department produces 160 gallons of waste per day.

Produce Departments generate bruised and spoiled fruits and vegetables and trim waste. This waste is usually kept separate from other waste streams until it is compacted. An average store would generate about 225 gallons of this material per day.

Opportunities

Most grocery stores have one or more strategies in place to deal with parts of their organic waste stream.

Bakery Departments usually donate packaged items but refuse to donate unpackaged items because of potential liability. Baked goods have a longer shelf life after their expiration date than other products so they are more often donated.

Deli Departments rarely donate their leftover food because it may have been sitting out in serving tables or on counters. The post-consumer waste stream produced by the delis is contaminated with uneaten food and paper and plastic. Waste generated from food preparation in the delis could be handled along with a store's other organic waste streams.

Floral Departments produce a small amount of organic waste that could be mixed with organic streams from other parts of the store.

Meat Departments usually send their bones, fat and meat scraps to rendering plants. This leaves contaminated paper and plastic waste to be managed.

Produce Departments offer the greatest opportunity for organic recovery. Bruised and spoiled product along with trim waste is usually uncontaminated and kept separate from the other organic streams in the store. This stream could be redirected from the trash compactor to another process.

Barriers

There are a number of barriers to the recovery of organic materials from grocery stores. Some of these apply to all departments and end uses for the materials, while others are specific to the department or end use.

Lack of information about organics recovery. Grocery store management may not be aware of the opportunities to recover organics currently being discarded in the trash.

Fear of Liability. The grocery storeowner may be afraid of legal action if there is a problem with the quality of the food that is donated.

Lack of containers and storage/refrigeration space. Grocery stores may not have storage space (usually refrigerated) to keep organic waste until it is transported off site for donation. Storage containers may need to be purchased to handle the volume and types of organic waste.

Increased labor costs. Grocery stores may need additional staff time to sort, package and/or transport the organic materials.

No existing collection system for organics. Currently, there is not a collection system in place to collect organic waste from grocery stores and other institutions (restaurants, hospitals, schools, etc.) and transport to a facility for processing.

Few facilities exist to manage the organic waste stream. Facilities are needed to manage the volume and types of organics generated by grocery stores. This includes the relatively pure stream from the Produce department and the contaminated streams from the Delis and Meat departments.

Summary

Organics recovery provides many options for grocery stores to reduce their solid waste stream and direct materials in other directions.

Food donation can be increased in most cases through a partnership between the grocery store and the Food Bank. Collection schedules and product decisions can be modified to best meet the needs of both parties. Prepared deli department food is an avenue to be explored for donation opportunities.

Organics composting is an untapped potential for grocery stores. While most stores may not compost their own materials on site, they can sort organics streams within the store to meet the requirements of compost operations in their area. The collection systems will need to be developed to transport the organics to a compost facility.

Reports

Metro Regional Organics Work Plan, prepared by Metro Regional Government, Portland, Oregon, 1999 – 2002.

Organics Waste Diversion Study – Summary of Findings, prepared by Metro Regional Government, Portland, Oregon, October 2000.

Communications Research in Organics Recovery, prepared by Metro Regional Government, Portland, Oregon, August 2000.

Waste Characterization Study, prepared by California Integrated Waste Management Board, 1999.

COMPOSTING

Food waste that is deemed unfit for human consumption can be fed to animals and plants, but the labor costs, health regulations and storage issues are the same. Composting may be considered the final disposal option. The greater the variety of materials going to a composting facility, the more complex the management of the material.

Opportunities

There are many organic waste streams generated in a grocery store, which can be handled at a composting operation. One of these streams is the pure organic waste stream from the Produce department which consists of bruised and spoiled fruit and trimmings. These waste materials are kept separate until they are added to the store's waste compactor. Another, more complicated, organic waste stream is from the Deli department of food preparation waste, post consumer waste including uneaten food, paper and plastic, and left over food at the end of the day. These two primary streams could each be mixed with fiber streams from the grocery store including waxed paper and cardboard. Each of these streams would require a different composting operation.

Barriers

There are a number of barriers to composting of organic materials from grocery stores.

Lack of information about organics composting. Grocery store management may not be aware of the opportunities to compost organics they are currently discarding in the trash.

Fear of Liability. The grocery store owner may fear legal action if there is a problem with the quality of the organic waste that is composted.

Lack of containers and storage/refrigeration space. Grocery stores may not have store space (usually refrigerated) to keep organic waste until it is transported off site to a composting facility. Storage containers may need to be purchased to handle the volume and types of organic waste.

Increased labor costs. Grocery stores may need additional staff time to sort, package and/or transport the organic materials to the composting operation.

No existing collection system for organics. Currently, there is not a collection system to collect organic waste from grocery stores and other institutions (restaurants, hospitals, schools, etc.) and deliver it to a composting facility for processing.

Inadequate facilities to compost the organic waste stream. Facilities are needed to compost the volume and types of organics generated by grocery stores. This includes the relatively pure stream from the Produce department and the contaminated streams from the Delis and Meat departments.

Multiple compost operations to handle multiple organics streams. The varied organic waste streams from grocery stores provide a challenge for operators setting up composting facilities. There may be special or additional requirements for composting a waste stream that includes paper products and waxed cardboard, or waste streams that contain raw or cooked meat products. This specialization of compost operations may require a prohibitive amount of sorting of organics at the grocery store level.

Case Studies

“Safeway Test Is Reducing Tonnage of Solid Waste”, Supermarket News, August 17, 1998.

The Portland, Oregon division of Safeway, headquartered in Pleasanton, California, is developing a pilot program to compost produce waste into garden and farming mulch. Produce trimmings, spoiled produce, non-greasy bakery products, and floral discards will be shipped to the distribution center for compacting. Waste Management Inc., the transporter, estimated that 80-120 tons a month will be shipped including waxed corrugated boxes.

“Vons Composting Program Grows Savings, is Expanded”, Supermarket News, March 6, 1995.

Vons Companies, headquartered in Arcadia, California, is using the unsaleable fruits and vegetables to make compost. The materials are packed into non-recyclable containers, palletized with shrink-wrap and kept cool. The pallets are collected daily and taken to the main distribution center to be compacted.

“Food Waste (composting)”, Progressive Grocer, June 2001

BI-LO Grocery Stores, in Franklin, North Carolina, have an agreement with the North Carolina Division of Pollution Prevention and Environmental Assistance, and Macon County Solid Waste Management Department to divert unusable food to the County compost site. This will include food waste (produce, deli/bakery, and meat) and paper from the administrative offices. These materials will be composted with sawdust and culled tomatoes and the compost used for landscaping.

“Retailers Are Finding Green Efforts Pay Off”, Supermarket News, May 8, 1995.

Environmental activities were discussed at the annual Grocery Manufacturers Association/Food Marketing Institute Environmental Affairs Conference. Vons Companies, headquartered in Arcadia, California, discussed their composting project where produce too damaged to sell is converted to compost to sell in their garden department. They are estimating a 50% reduction in the waste stream.

“Jamaica Market Food Court – On-Site Composting,” www.nycwaasteless.com/gov-bus/Casestudies

Jamaica Market Food Court in Queens, New York is an enclosed food court surrounded by ten restaurants and six retailers and a farmers market during the summer months. The Market generates almost 100 tons of food waste per year. Because the volume of food waste did not warrant transportation to an off-site composting facility, the Market operates two Green Mountain Technologies Earth Tubs for composting. About 1,000 pounds (about 1 cubic yard) of food waste is collected weekly for composting.

“Hunts Point Terminal Produce Market – Food Waste Composting and Wood Recycling,” www.nycwaasteless.com/gov-bus/Casestudies

The Hunts Point Terminal Market, located on 126 acres in Bronx, New York, is one of the premier produce markets in the world, with 65 fruit and vegetable wholesalers. In 1997, the wholesalers began sending truckloads of source separated produce scraps to farms on Long Island for composting. The Market’s waste hauler used a state grant to lease a commercial food pulper/screw press to reduce the volume of organics by 50%.

“Food Waste Recycling”, 2/14/02 Email from Bernadette Thavarajah, Solid Waste/Recycling Manager, Publix Super Markets serving Florida and the Southeast and winner of the U.S. EPA Environmental Merit Award for 2000.

“Publix Super Markets recycles the traditional items from the store – cardboard, plastic stretch wrap, plastic and paper grocery bags and some waxed cardboard. Fat, bones and waste cooking oil are collected by a renderer and bakery items are donated to local food banks and charities, if they commit to picking the materials on a regular basis. Other bakery scraps are collected for pick-up by hog and cattle farmers, together with produce trimmings and blemished produce. However as the areas get more urbanized, and the price of grain remains low, the number of farmers collecting the produce and bakery stales has dropped.

We are actively looking for opportunities to divert and recycle/ compost the organic fraction of our waste-stream, since organics make up the bulk of the material thrown in the trash. However Florida has only 2 facilities that can accept limited quantities of MSW. Palm Beach County's facility is not interested in taking the organic waste, and the other facility in Sumter County is too far away to justify taking food wastes to it.

We are starting a project with Sarasota County to explore the three levels of food donation. Sarasota County won an Innovative Recycling Grant from the Florida Dept of Environmental Protection to look at a three tiered approach to diverting food "waste" from the store. It is loosely based on our program except that this project also involves set-up of a composting and a vermicomposting operation. Sarasota County has linked up with a Food Bank, and plans to purchase a refrigerated truck for them

so they can pick-up "people" and "animal" food (edible good foodstuffs for the Food Bank, and the lesser quality produce trimmings and blemished items for animal feed). They plan to set up a route and have their contract hauler pick-up the "plant" food (or waste organics) and transport it to the composting site.

The route will be designed for optimum density, and will include the voluntary participation of food stores, retail chains and restaurants. Publix stores will serve as anchors for the route selection. I plan to design the method for separation of the organics into the 3 streams at the store. We will then provide the training materials to Sarasota County. The County will sign up the businesses and train them in diversion of the organics.

We are just getting started. The big challenge is to have the organics for composting collected frequently, so that odor and pests do not become problems. Space is rather limited so sorting materials into several color coded wheeled carts will be another challenge. Publix is only constrained by the need to find recyclers close enough to where the transportation of the recycled material will not be a problem.”

Summary

The potential for organics composting is great, but a system needs to be developed to address the barriers listed above.

1. Facilities are needed to compost the organics waste streams from grocery stores. A store might choose to compost on site but this is rare. Most stores want to send their organic materials off site to a composting operation. These operations need to be designed and sized to handle specific streams. If contaminated paper is added to the stream, it requires a different system. If raw or cooked meat is part of the organic stream, the system will need to operate differently. Facilities will only be developed when operators feel they can find adequate organics and have a market for the finished compost product.
2. When the compost facilities to serve the grocery stores have been identified, the stores will need to develop systems to sort the organics streams to meet the requirements of the facilities. This will also involve packaging and storing the waste materials on site until they are transported.
3. Collection systems will be needed to move the organic waste from the grocery stores to the composting operations. These systems may already be in place, may need to be developed or can be added to existing collection systems that may or may not include the waste hauling system.

Reports

Metro Regional Organics Work Plan, prepared by Metro Regional Government, Portland, Oregon, 1999 – 2002.

Organics Waste Diversion Study – Summary of Findings, prepared by Metro Regional Government, Portland, Oregon, October 2000.

Communications Research in Organics Recovery, prepared by Metro Regional Government, Portland, Oregon, August 2000.

Waste Characterization Study, prepared by California Integrated Waste Management Board, 1999.

FOOD RESCUE

Food rescue provides a vital link between surplus food supplies and emergency food assistance to hungry people while also reducing waste. It is based on the simple concept of picking up healthy excess food and delivering it to non-profit agencies serving people in need. The primary focus of food rescue is to redistribute prepared and perishable food.

Twelve Baskets

Twelve Baskets is the only food rescue program that serves the Twin Cities metropolitan area. The program is sponsored by Second Harvest Heartland, a food bank that serves 41 Minnesota counties, including Washington County and 20 counties in Wisconsin.

Since its inception in 1984, Twelve Baskets collects, transports and delivers the unserved portions of prepared and perishable food to non-profit agencies in the Twin Cities metropolitan area that serve meals to the homeless, the working poor, children, seniors and people in transitional housing who are working toward self-sufficiency. The program accepts unserved, prepared foods which are properly refrigerated and packaged such as deli, produce, dairy, bakery and canned/dry goods.

Twelve Baskets has a donor base of over 520 businesses and serves 61 non-profit agencies in the Twin Cities metropolitan area with five refrigerated trucks and six full time drivers trained and certified as food managers by the State of Minnesota. The program is funded by individual contributions from fund-raising campaigns and government and corporate grants. Traditionally, this program “runs in the red” each year and is subsidized by Second Harvest Heartland to keep it operating.

Food Banks

There are six food banks in Minnesota. The primary focus of food banks is to temporarily store dry goods and personal care products in warehouses and to redistribute them to non-profit agencies that serve people in need. Second Harvest Heartland, the largest food bank in Minnesota, is a member of Hunger Solutions, Minnesota’s food bank advocacy organization. Hunger Solutions is affiliated with America’s Second Harvest, the national food bank advocacy organization located in Chicago.

Opportunities

Businesses that donate food to food rescue programs are protected against liability by the Good Samaritan Law and may benefit from a tax deduction.

Good Samaritan Law

In 1996, the Bill Emerson Good Samaritan Food Donation Act was signed replacing all existing state laws and encouraging the donation of food and grocery products to non-profit organizations. This national legislation provides protection for food and grocery

products that meet all quality and labeling standards imposed by Federal, State and local laws and regulations. The law protects food donors, including individuals and non-profit feeding programs who act in good faith. While exceptions are noted for gross negligence, the law states that these groups will not be subject to civil or criminal liability arising from the “nature, age, packaging or condition of apparently wholesome food or an apparently fit grocery product.” The law is available on Second Harvest Heartland’s web site at www.2harvest.org.

Tax Deduction

Under current tax law, a company that donates food to a food bank is eligible to receive a “special rule tax deduction” under Sec. 170(e)(3) of the Internal Revenue Code. The “special rule deduction” allows a company to deduct the cost (or basis) of the donated product and up to half the mark-up of the product’s fair market value, not to exceed twice the cost. Current tax law limits the “special rule deduction” to C corporations, thus disallowing farmers, ranchers, small businesses and restaurant owners from receiving the same tax benefits afforded to corporate donors.

President Bush included in his FY2003 budget proposal more generous tax deductions for the donation of food inventory to charity. Under this plan, the enhanced tax deduction would equal “fair market value” (cost plus the entire gain had the product been sold), and all business forms (sole proprietorships, partnerships, S corporations and C corporations) would be eligible for the enhanced food inventory deduction. More information on the status of this proposal can be obtained by contacting Hunger Solutions at 651-486-9860.

Barriers

Twelve Baskets is the only food rescue program within Minnesota’s network of food banks that has the infrastructure to redistribute prepared and perishable food in the Twin Cities metropolitan area. In 2001, Twelve Baskets redistributed over 1.25 million pounds of surplus food that would otherwise have been disposed of as food waste. However, at its current recovery capacity, the program estimates that it rescues only about 25 percent of the potential excess prepared and perishable food available in the Twin Cities. Twelve Baskets currently serves 16 grocery stores in the metropolitan area including one store in Washington County.

Limitations to Food Rescue

The Portland Metro Regional Government (2001) reports that food rescue programs tend to recruit food donors most heavily by word of mouth, and few programs have the resources or personnel necessary to actively recruit donors. Trucks and drivers are all in short supply, and potential donors need to be educated about the Good Samaritan Law. The capacity for recovery is often limited by the amount of refrigeration and freezer space available at recipient, non-profit agencies.

To increase its capacity for recovery, Twelve Baskets indicates that its primary needs are funding to close the gap between surplus food supplies and the needs of non-profit agencies serving people in need such as:

1. Funding for more refrigerated trucks and drivers.
2. Funding for refrigerators and freezers at non-profit agencies.
3. Funding for a third party food solicitor to aid in networking businesses.
4. Funding for educational materials and to develop marketing strategies.
5. Funding to offset the costs of food packaging provided to food donors.
6. Funding for a computer network that links large donors with recipient agencies.

No Donation Policies

Some grocery stores in the Twin Cities metropolitan area have implemented no donation policies. The Portland Metro (2001) states that motivations for no donation policies in businesses have been identified as:

1. Fear of liability.
2. Additional costs of labor and time.
3. Storage space.
3. Negative perception of overproduction.
4. Sufficient quantities to donate.
5. Distributor permission.
6. Image of company with their label on donated items.
7. "If it's not fit to sell, it's not fit to donate."

Case Studies

Kowalski's Market

Kowalski's Market, with seven locations in the Twin Cities, has been a Twelve Baskets food donor since the program started in 1984. Over the years, Kowalski's has donated a wide range of food including deli products, sandwiches, produce, bakery, dairy and

occasionally dry good items. The new Kowalski's Market in Woodbury (Washington County) began donating to Twelve Baskets as soon as the store opened in 2001.

Albertson's

Albertson's is one of the largest retail food and drug chains in the United States. It owns over 2,500 stores in 36 states across America and is headquartered in Boise, Idaho. In 2000, Albertson's distribution centers, in conjunction with its suppliers, donated more than 22 million pounds of food and household goods to food banks affiliated with Second Harvest, churches and other local hunger-relief operations across the country.

Albertson's donates day-old bakery products every day to local food banks and soup kitchens under its Day-Old Bakery Donation program.

Summary

The opportunity to explore ways to bridge the gap between surplus food supplies that are discarded in the waste stream and non-profit agencies serving people in need is wide open. Funding options, awareness and education campaigns featuring businesses successfully donating food and building relationships between donor and recipient organizations are all strategies available to promote food rescue in the Twin Cities metropolitan area.

Portland Metro (2001) states that businesses operating under zero donation policies must be approached with an arsenal of information demonstrating the opportunities to reduce waste disposal costs, providing hunger relief, existing protection from liability and examples of similar businesses actively donating. Business managers, owners or administrators should be presented with food donation information by a liaison acting as third party to negotiations. Outreach strategies need to be developed in a manner that does not emphasize overproduction. Industries may resist donation if it creates an image of inefficiency.

Reports

Organics Waste Diversion Study, Phase II, prepared by Metro Regional Environmental Management Department, Portland, Oregon, May 2001.

Fact Sheets

Second Harvest Heartland Fact Sheet.

Second Harvest Heartland Twelve Baskets Fact Sheet.

Internet

Second Harvest Heartland at www.2harvest.org.

America's Second Harvest at www.secondharvest.org.

MANUFACTURING LIVESTOCK FEED

Three types of businesses were identified as having interest in manufacturing livestock feed or feed ingredients from organic grocery store waste: (1) rendering companies; (2) food waste processors; and (3) livestock producers.

Reports

Animal Feed Market Study, prepared by Organic Recycling Systems for Portland Metro Regional Government, July 2001.

RENDERING COMPANIES

Rendering is the treatment of animal tissue by thermal and/or chemical processes to separate fat from protein and mineral components. In a grocery store, fat and bone trimmings generated in the meat department are oftentimes collected and transported to rendering companies where this waste material is processed into livestock feed ingredients such as fat and protein (e.g., meat and bone meal).

Opportunities

Collecting fat and bone trimmings from meat departments is a well established organic waste management practice in the grocery industry. Historically, rendering companies have been able to provide grocery stores collection containers and transportation services at no charge. Depending on the volume of material per pick up and the market price for animal fat and protein, rendering companies often paid grocery stores for the economic value of this organic waste material. The price paid to grocery stores was determined by the rendering value of this waste material which is driven by the finished product price.

Barriers

Over the last three or four years, the market price for livestock protein sources has fallen dramatically due to the overproduction of soy beans. An over supply of soy beans has driven the world price of livestock protein down. Soy beans are in direct competition with animal protein produced from fat and bone trimmings. Market prices for finished product have fallen so low that rendering companies have been forced to charge grocery stores transportation fees for picking up fat and bone trimmings.

Summary

If market prices for finished product do not recover with time, rendering companies may be at risk of losing grocery store customers and fat and bone trimmings from meat departments may enter the waste stream.

Internet

National Renderers Association at www.renderers.org

FOOD WASTE PROCESSORS

Food waste processors manufacture livestock feed ingredients from a wide variety of inedible food products such as cookies, dough, cereal, pasta, crackers, bread, bagels and chips.

Opportunities

Endres Processing in Rosemount picks up food waste products in the Twin Cities metropolitan area and processes them into an animal feed ingredient that is registered by the Department of Agriculture. Food waste products are heat treated, dried to less than 10 percent moisture, ground and screened to particles that are less than 1/10th of an inch. The company processes over 6,500 tons of waste food products per week. Endres Processing currently collects food waste from grocery stores, and its goal is to increase the number of grocery stores it serves in the Twin Cities metropolitan area.

Barriers

The barriers to manufacturing livestock feed ingredients from food waste generated at grocery stores are listed below.

1. **Limited food waste manufacturing facilities** equipped to accept the varied food waste streams generated in grocery stores.
2. **No transportation system in place** to transport food waste from grocery stores to food waste processing facilities.
3. **Limited internal or external space** at grocery stores to store containers to collect food waste.
4. **Lack of internal collection systems** established in grocery stores to recover the food waste fraction from their solid waste stream.
5. **Lack of information** among grocery store management about the opportunity to manufacture livestock feed ingredients from food waste and other solid waste reduction and recycling strategies.

Summary

There is significant potential for food waste from grocery stores to be manufactured into livestock feed ingredients, but a system needs to be established to address the barriers above. More information about existing food waste manufacturing facilities is needed and their ability to handle the unique food waste streams from grocery stores. For example, a food waste manufacturing facility may need to manage processed and/or raw or cooked meat differently from fruit and vegetable wastes. Once appropriate food waste manufacturing facilities have been identified, grocery stores need to develop in-store

collection systems to recover food waste that meet the requirements of the facilities. Transportation systems need to be developed to transport food waste from grocery stores to food waste processing facilities.

Internet

Endres Processing LLC at www.endresprocessing.com

LIVESTOCK PRODUCERS

Livestock producers can use food waste as livestock feed if they have obtained a permit from the Minnesota Board of Animal Health. Two types of permits are available to livestock producers: (1) exempt materials permits; and (2) garbage feeder permits. An exempt materials permit allows a livestock producer to feed non-meat food waste to livestock. This food waste must have had no possibility of coming into contact with meat for an exempt materials permit holder to accept it. Garbage feeder permit holders can accept meat by-products and other food by-products that may have come into contact with meat.

Typically, livestock producers collect food waste from grocery stores and feed it to hogs. Because grocery stores sell meat and meat products, these livestock producers must hold garbage feeder permits. To help prevent the spread of disease, Minnesota state law requires livestock producers to cook food waste collected from grocery stores at 212°F for 30 minutes. Once a month their facilities and trucks are inspected by the Minnesota Board of Animal Health.

Opportunities

Currently, there are ten livestock producers that hold garbage feeder permits in Minnesota. Many of these farmers collect food waste from Twin Cities metropolitan area grocery stores.

Barriers

Livestock producers have served many Twin Cities metropolitan area grocery stores for a number of years. Hog feeding was especially popular in the early 1990s due to high solid waste disposal costs. However, some grocery stores discontinued this solid waste management practice when solid waste disposal costs lowered.

Fact Sheets

Feeding Food By-Products to Livestock, prepared by Minnesota Technical Assistance Program, University of Minnesota.

List of Garbage Feeder Permit Holders, provided by Minnesota Technical Assistance Program, University of Minnesota.

NON-ORGANIC WASTE

REUSABLE TRANSPORT PACKAGING

Transport packaging waste from grocery stores typically includes corrugated cardboard boxes, pallet wrap, wood pallets and plastic crates. In 1995, Franklin Associates found that from 1990 to 1993 the use of transport packaging by grocery stores increased 15 percent and projected another 15 percent increase from 1993 to 2000. This increase is primarily due to: (1) a widened distribution area as food products are being shipped across the United States and to international markets; and (2) an increase in deliveries of fresh produce requiring the use of more corrugated containers. Even though recovery of transport packaging has also increased, in 1994 it only accounted for about a third of the grocery transport packaging generated (Resources for the Future, 2000).

Opportunities

Reusable Pallets

Headley Pratt Consulting (1998) states that the most significant reuse effort underway in the grocery industry involves replacing wood pallets with reusable plastic pallets. Any economic benefits of such a switch will be minimal at the retail grocery store level, but it appears that there may be substantial savings at the wholesaler/distributor level.

Reusable Containers

In June 1997, Bottom Line Consulting, Inc. found that reusable containers have established themselves as the transport container of choice for dairy, bread and soda beverages to retail grocery stores, and fresh produce (fruits and vegetables) stands out as the major opportunity for expanding the use of reusable containers. Any conversion to reusable containers will be driven by the retail grocery chains, and economics will determine if a conversion to reusable containers occurs. The most important factor in considering expanded use of reusable containers is if their performance benefits (improved pre-cooling efficiency, reduced product damage, longer shelf life and product-handling efficiencies in the store) will place the economics in favor of reusable containers.

Barriers

Reusable Pallets

Supermarket News (October, 1995) states that the majority of manufacturer shipments in the grocery industry still travel on wooden pallets despite growth in the use of pallet rental services and plastic pallets. The cost of plastic pallets is still prohibitive. The grocery store retailer is instead concentrating on improved pallet record-keeping and enhanced warehouse employee training.

Reusable Containers

Bottom Line Consulting (1997) states that one of the fundamental problems of transporting fresh fruits and vegetables is the wide variety of produce available plus the new and growing segment of pre-packaged products such as salads and prepared vegetables. As a result, the current system of containers is as varied as the products—unwaxed and waxed corrugated, flats, no-lid boxes, closed boxes with many different footprints and pallet loading characteristics.

Case Studies

H.E.B. Grocery Company

H.E.B. Grocery Company is the largest family-owned grocery company (235 stores) in the U.S. and is located in San Antonio, Texas. The company replaced one-time-use shipping containers to plastic totes and has reduced its fleet of containers from 35,000 to 24,000, increased inventory turns 400% and realized a cost savings of \$6 per tote and 50% increase in storage efficiency.

Wal-mart

Wal-mart, with corporate headquarters in Arkansas, replaced single-use corrugated boxes with a “display ready concept” for fresh produce. The grower packs fresh produce in a reusable plastic container, produce is shipped to Wal-mart’s distribution centers and then to retail stores where reusable plastic containers are placed in displays in the produce department. After the produce is sold, the retail store returns empty containers to the distribution center and then to the grower.

Albertson’s

Albertson’s is one of the largest retail food and drug chains in the United States. It owns over 2,500 stores in 36 states across America and is headquartered in Boise, Idaho. In 1999, Albertson’s was instrumental in the development of a standard display-ready container for the entire produce industry. This container now carries 50 percent of the produce shipped to Albertson’s stores.

Summary

Bottom Line Consulting (1997) states that realizing full advantages of reusable containers is likely to require total commitment and changeover by the retail grocery industry. Partial conversion to reusable containers will be difficult. This changeover will require new thought processes by both retailers and growers.

Reports

Albertson’s, Inc., 2000 Company Profile.

Delivering the Goods: Benefits of Reusable Shipping Containers prepared by INFORM, 1994.

Environmental Implications of the Foodservice and Food Retail Industries prepared by Resources for the Future, March 2000.

Feasibility of Reusable Plastic Containers (RPCs) for Shipping and Displaying Produce prepared by BRC for the Alameda County Source Reduction and Recycling Board, June 2000.

Grocery Packaging in Municipal Solid Waste prepared by Franklin Associates for the Grocery Manufacturers of America, 1995.

Reusable Transport Packaging Market Research Report prepared by JL Taitt & Associates for the Solid Waste Management Coordinating Board, May 2001.

The Environmental and Economic Benefits of Reusable Plastic Shipping Containers prepared by Bottom Line Consulting, Inc. for the American Plastics Council, June 1997.

Transport Packaging: Cost-Effective Strategies for Reducing, Reusing and Recycling in the Grocery Industry prepared by Headley Pratt Consulting for the Minnesota Office of Environmental Assistance, August 1998.

Articles

“Stimulating the Pallet,” *Supermarket News*, October 23, 1995.

RECYCLING

In 1997, the Food Marketing Institute conducted a mail survey of its members' environmental practices. A total of 108 companies responded, which in total operate 5,810 grocery stores. The survey found that most or all of the time grocery stores recycle corrugated boxes, wood pallets, aluminum cans and white paper. In August 2001, Washington County, Minnesota surveyed 14 grocery stores and found that the majority of grocery stores do not recycle aluminum, plastic or glass, and all of the stores recycle corrugated cardboard. INFORM (1994) reports that the food and beverage industry received more shipments in corrugated boxes than any other industry in 1993, and nearly 80 percent of grocery retailers have corrugated cardboard recycling programs.

Opportunities

Corrugated Cardboard

Headley Pratt Consulting (1998) reports that there is a strong economic incentive for stores to recycle corrugated cardboard due to the avoided disposal costs and the revenue generated from recovering it.

Additional Materials

Washington County (2001) indicates that most grocery stores were interested in recycling additional materials but lacked the resources and time to explore the opportunities. With some assistance, most of the stores would be willing to institute a recycling program to collect aluminum, plastic, glass and paper.

Barriers

Corrugated Cardboard

The Grocery Manufacturers of America (1995) suggest that wax-coated corrugated cardboard (e.g., non-recyclable boxes) may comprise as much as 30 percent of a store's total corrugated cardboard stream. The American Forest and Paper Association indicates that approximately 10 to 15 percent of non-waxed boxes (e.g., recyclable boxes) are inadvertently thrown away at grocery stores because employees are confused about which boxes are and are not recyclable.

Case Studies

H.E.B. Grocery Company

H.E.B. Grocery Company is the largest family-owned grocery company (235 stores) in the U.S. and is located in San Antonio, Texas. In 1994, H.E.B. was recycling cardboard, scrap metal, aluminum and plastic bags.

Albertson's

Albertson's is one of the largest retail food and drug chains in the United States. It owns over 2,500 stores in 36 states across America and is headquartered in Boise, Idaho. Albertson's stores recycle corrugated cardboard, plastics, wooden pallets, bakery buckets, cooking oil, meat and bone scraps, single-use cameras and printer cartridges.

Wakefern Foods/ShopRite Supermarkets

Wakefern Foods/ShopRite Supermarkets is the largest retailer-owned food cooperative in the United States with more than 190 stores. In 1990, it began a customer bag reuse program to reduce costs and reduce solid waste. The program distributed educational materials and offered a refund of 2¢ per bag. In 1998, about 8.4 million bags were reused. This was a savings of \$168,000 per year for the bags and \$300,000 to \$800,000 with labor, storage and transportation.

Summary

Corrugated Cardboard

Headley Pratt Consulting (1998) reports that making changes related to wax-coated corrugated cardboard represents the single biggest area where grocery stores could accrue additional economic benefits due to recycling. Stores could benefit by additional avoided disposal costs and recycling revenue by recovering recyclable corrugated cardboard that currently may be thrown away due to confusion with wax-coated corrugated boxes.

Additional Materials

Grocery stores may realize additional economic benefit by recycling more materials such as aluminum, plastic, glass and paper.

Reports

Albertson's, Inc., 2000 Company Profile.

Baseline Data for Waste Generated at Grocery Stores in Washington County prepared by the Washington County Department of Public Health and Environment, August 2001.

Delivering the Goods: Benefits of Reusable Shipping Containers prepared by INFORM, 1994.

Report on Environmental Practices prepared by the Retail food Industry Center at the University of Minnesota for the Food Marketing Institute, 1997.

Transport Packaging: Cost-Effective Strategies for Reducing, Reusing and Recycling in the Grocery Industry prepared by Headley Pratt Consulting for the Minnesota Office of Environmental Assistance, August 1998.

Articles

“Albertson’s Pitches In, Increases Recycling by 25%,” *Supermarket News*, May 7, 2001.

“Green Grocers: Retailers and Wholesalers Have Quietly Been Making Big Strides in Environmental Management,” *Supermarket News*, November 6, 1995.

“Larry’s Adopting Green Report Cards,” *Supermarket News*, October 23, 1995.

“Retailers Recycle, Seek Energy Deregulation Information,” *Supermarket News*, March 2, 1998.

Internet

“ShopRite Supermarkets Save-A-Bag Grocery Bag Reuse Program,”
www.nycwasteless.com/gov-bus/casestudies.

APPENDIX B
Washington County Grocery Store
Information Obtained During On-Site Visits

1. Department name.
2. Manager's name and number of employees.
3. Hours of operation and number of shifts.
4. Description of products sold.
5. Type of transport packaging product is delivered in:
 - a. Pallets
 - b. Cardboard boxes
 - c. Shrink wrap, banding, etc.
6. How transport packaging waste is managed.
7. Description of food expiration policy.
8. Description of food donation policy.
9. Visual of trash composition.
10. Number and size of trash containers.
11. Number of trash containers filled and taken to trash compactor per day.
12. How trash is transferred from department to trash compactor.
13. Other solid waste management strategies implemented (e.g., recycling, rendering, hog feeding, reusable transport packaging, etc.).

APPENDIX C
Highlights of Information Obtained During
On-Site Visits at Washington County Grocery Stores

Bakery Department

Product Sold	Transport Packaging	Trash Visual	Average Trash Volume Gallons/Day
Baked goods consisting of breads, muffins, cakes, buns, cookies, donuts, etc.	<p>Product is delivered in reusable bakery trays on wheels. Can nest & stack when empty.</p> <p>Product is delivered in cardboard boxes, shrink wrapped on pallets. About half are wooden pallets and half are reusable pallets. All pallets are sent back to suppliers. Cardboard boxes are recycled and shrink wrap is trashed.</p>	About 50 to 75% of trash is organic. Non-organic trash is composed of plastic bags, plastic wrap, plastic bottles and rigid plastic containers.	185

Dairy & Frozen Food Department

Product Sold	Transport Packaging	Trash Visual	Average Trash Volume Gallons/Day
<p>Pre-packaged dairy products consisting of milk, yogurt, butter, cheese, etc. About 80 to 90% of dairy product packaging is plastic.</p> <p>Pre-packaged frozen foods consisting of ice cream, prepared foods, vegetables, juice, etc. Frozen foods are sold in plastic and fiber packaging.</p>	Product is delivered in cardboard boxes, shrink wrapped on pallets. About 50 to 85% are reusable pallets. All pallets are sent back to suppliers. Cardboard boxes are recycled and shrink wrap is trashed.	About 80% of trash is cardboard boxes. Non-organic trash is mostly composed of shrink wrap.	35 Up to 90% of damaged or expired products are sent back to suppliers.

Deli Department

Product Sold	Transport Packaging	Trash Visual	Average Trash Volume Gallons/Day
Hot foods consisting of chicken, various entrees, etc. Cold foods consisting of meats, cheeses, salads, bakery products.	Product is delivered in cardboard boxes, shrink wrapped on pallets. About half are wooden pallets and half are reusable pallets. All pallets are sent back to suppliers. Cardboard boxes are recycled and shrink wrap is trashed.	About 50% of trash is organic. Non-organic trash is composed of plastic bags, plastic wrap, plastic bottles and rigid plastic containers.	200

Floral Department

Product Sold	Transport Packaging	Trash Visual	Average Trash Volume Gallons/Day
Fresh cut flowers, green and blooming plants, glassware and pottery.	Product is delivered in cardboard boxes. About 50% are waxed boxes.	About 70% of trash is organic. Non-organic trash is mostly composed of plastic.	80

Grocery Department

Product Sold	Transport Packaging	Trash Visual	Average Trash Volume Gallons/Day
Canned and packaged foods (non-perishable) and non-food items (paper and cleaning products).	Product is delivered in cardboard boxes, shrink wrapped on pallets. About half are wooden pallets and half are reusable pallets. All pallets are sent back to suppliers. Cardboard boxes are recycled and shrink wrap is trashed.	About 90% of trash is plastic shrink wrap. Remaining trash is product in broken or leaking containers.	60 Damaged and expired products are sent back to suppliers.

Meat & Seafood Department

Product Sold	Transport Packaging	Trash Visual	Average Trash Volume Gallons/Day
Meat products consisting of prepackaged poultry, veal and ground beef; and beef that is cut, weighed, packaged and labeled. Fresh and frozen seafood products.	Product is delivered in cardboard boxes, shrink wrapped on pallets. About half are wooden pallets and half are reusable pallets. All pallets are sent back to suppliers. Cardboard boxes are recycled and shrink wrap is trashed.	About 50% of trash is organic. Non-organic trash is composed of plastic bags, plastic wrap, foam trays and absorbents.	205

Produce Department

Product Sold	Transport Packaging	Trash Visual	Average Trash Volume Gallons/Day
About 50% of product is fresh, bulk fruits and vegetables. Other 50% of product is fresh, prepackaged vegetables, salads, etc.	Product is delivered in cardboard boxes, shrink wrapped on pallets. About half are wooden pallets and half are reusable pallets. All pallets are sent back to suppliers. Cardboard boxes are recycled and shrink wrap is trashed.	About 80% of trash is organic. Non-organic trash is mostly comprised of plastic bags and plastic rigid containers.	215