Pollution Prevention in the Commercial Sector

A Waster Stream Assessment

in the

Grocery Store Sector

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Pollution Prevention in the Commercial Sector in the State of Nebraska:

The Grocery Store Category

Introduction

The Center for Infrastructure Research at the University of Nebraska - Lincoln received a grant from the U.S. Environmental Protection Agency to perform waste reduction assessments on seven categories of **businesses** and industries within the State of Nebraska. Federal funding for waste minimization projects has been made available to state governments and institutions in recent history due to the decreasing number of landfIlls nationwide and increasing quantities of waste generated each year. This report summarizes the results of waste reduction assessments performed on grocery stores in Nebraska.

Project Participants

There were five grocery stores which volunteered to participate in the Pollution Prevention Project. Four of the stores were located in Lincoln, Nebraska and one was located in a community with a population of less than 7,500. Due to the community's smaller size, its name will not be disclosed to protect the identity of the store. Table 1 on the following page shows the sizes and operating hours of each establishment.

As shown in Table 1, the sizes of the individual stores varied widely to ensure that a representative cross section of Nebraska's grocery stores was assessed. The size of Grocery Store C was confidential, but the area of the store was estimated to be less than 38,000 square feet and greater than 22,000 square feet. One of the most important objectives of the Pollution Prevention Project is that identified waste minimization opportunities be applicable to a majority of the grocery stores in Nebraska.

Table 1. Size of Project Participants in the Grocery Store Category.

Grocery Store	Number of Employees	Area of Store (ft^2)	Area of Selling Space (ft^2)	Operating Hours
A	65	17,000	14,500	Open 7 days/wk
B	45	22,000	13,000	Open 6 days/wk
C	Confidential	Confidential	Confidential	Open 24 hrs/day
D	185	38,000	33,000	Open 24 hrs/day
E	155	70,000	65,000	Open 24 hrs/day

The services provided by the stores also varied. Two of the establishments were of the warehouse-type which offered discounted prices by buying large quantities of products and reducing the number of services provided to customers. Customers sacked their own merchandise and used grocery carts to haul their purchases to their vehicles. The other three stores provided those services.

Recycling Markets

Information gained during the assessments suggested that grocery stores are not significantly affected by the lack of recycling facilities in their community. The grocery store which was located in the smaller community was able to recycle the same materials as Lincoln-area grocers because their wholesaler was located in Omaha, Nebraska. The wholesaler picked up their cardboard and recycled it for them. The wholesaler also offered the store the opportunity to recycle their plastic grocery sacks.

The management of another grocery store (located in Lincoln) also remarked that their grocery wholesaler would recycle their cardboard if they did not already have a local recycling firm picking up the bales. Wholesalers can transport recyclable materials back to their warehouse location inexpensively since the trucks are empty after a delivery and must return to the warehouse anyway. According to the 1990 - 91 Nebraska Business Directory

(American Publishing Co., 1990), the majority of Nebraska's grocery wholesalers are located in Lincoln and Omaha, and therefore, have access to several recycling facilities or can act as their own recycling organization.

Source Reduction Opportunities for Grocery Stores

Based on the information received during the waste reduction assessments, it was noted that grocery stores have a difficult time implementing source reduction methods. Most of the waste generated by a grocery store consists of packaging materials (e.g. corrugated cardboard, miscellaneous plastic films, shrink wrap, wooden crates, waxed cardboard boxes) used by suppliers to protect merchandise during shipping. The stores which sell the highest volume of products have the highest waste generation rates. Many source reduction methods for grocery stores depend on the customer reusing an item or a manufacturer reducing the amount of packaging used on a particular product. The following methods were identified as source reduction activities used by at least one of the project participants:

1. Paper Grocery Sacks. Customers received $0.05 for each grocery bag they returned and reused to sack their own merchandise.

2. Plastic Juice & Water Containers. Customers were allowed to bring back clean plastic containers to be refilled with a liquid product. The price of the product was discounted if a container was reused.

3. Bakery Use - Waxed Paper and Plastic Bags. Sheets of waxed paper were reused several times for lining pans to prevent baked goods from sticking. Plastic bags were reused several times to cover baked goods after they had cooled.

4. Office and Computer Paper. Both sides of office and computer paper were used before being discarded or recycled.

5. Cloth Roll Hand Towels. Cloth towels were used in restrooms to eliminate paper towel waste. The cloth towels were provided by the store's uniform service.

The effect of the above-listed source reduction methods on waste generation rates

at individual stores is not known. The reuse of plastic containers and grocery sacks will only reduce the amount of waste generated by customers. Although these methods probably do not significantly reduce the amount of landfilled waste or disposal costs for each store, they are easily implemented, reduce the number of supplies purchased for m-store use, and demonstrate the store's concern for the environment (i.e. improve public image).

Waste Minimization Opportunities for Grocery Stores

Many grocery stores, in general, have excellent waste minimization programs which when implemented, can significantly reduce the amount of landfilled waste and can be profitable. The following are examples of wastes which were minimized or recycled by at least one of the project participants:

1. Bakery Items. Day-old bakery items were donated to and picked up by charitable organizations on a daily basis.

2. Corrugated Cardboard. Cardboard was collected in compactor containers or baled and sold to paper recycling firms.

3. Damaged Items. Damaged items that were safe for consumption were sold to customers at a reduced price or used in the store when preparing food (if possible) instead of returning them to the manufacturer. Products, such as cleaning supplies, bar soap, and antifreeze, that had been damaged were also used in stores. Damaged frozen items (which were not returnable) were given to employees instead of being discarded.

4. Meat Trimmines & Bone. Meat trimmings and bone were sold to local rendering companies. One company also accepted outdated fish with the meat trimmings. The rendering firms picked up the trimmings on a regular basis.

5. Newspapers. Outdated newspapers were recycled with corrugated cardboard.

6. Office & Computer Paper. Office and computer paper were recycled with corrugated cardboard.

7. Plastic Films & Grocery Sacks. Some types of clean, plastic films (excluding shrink wrap) were recycled with a store's post-consumer grocery sack collections. The sack collections were picked up by the grocery wholesaler and eventually shipped to the

sack manufacturer's recycling facility. Two chemical companies manufacture plastic grocery sacks and currently accept plastic collections from grocery wholesalers located in Nebraska. If a store is interested in recycling plastic grocery sacks, their wholesaler should be contacted to see if this service is offered.

8. Aluminum Beverage Containers. Aluminum beverage containers were collected in break rooms for recycling.

9. Produce. Substandard produce was sold **to** a zoo, donated to farmers for animal feed, and donated to charity organizations. It was recommended that all spoiled produce be composted, if possible, instead of being discarded to the landfill or **to the** sanitary sewer via the garbage grinder.

10. Used Cooking Oil. Used cooking oil from bakery and deli fryers was sold **to the** same rendering company who purchased the store's meat trimmings.

11. Wooden Pallets.. All wooden pallets, used by suppliers to deliver products to the stores, were picked up and reused for subsequent deliveries.

Corrugated Cardboard Recycling

Cardboard was found to be the largest waste stream generated by a grocery store, and the only recycling activity which significantly reduced disposal fees. For the four that recycled cardboard, it was estimated that this practice reduced landtilled waste by 30% to 70%. (Analysis of the assessment data appears to suggest that on average 50% to 70% of a grocery store's solid waste is corrugated cardboard.)

Three of the stores baled cardboard, and one collected it in a 42-cubic yard compactor container. The bales were picked up by a paper recycling firm or a grocery wholesaler on a regular basis. The 42-cubic yard compactor container was hauled by the store's refuse service to a paper recycling firm and emptied. The stores received $10 to $18 per ton for the cardboard collected. Grocery Store D did not recycle cardboard, but expressed interest in purchasing a 42-cubic yard compactor container for cardboard recycling purposes.

Table 2 illustrates the income generated from cardboard sales, the savings on disposal costs, the cost of the baler or compactor container, and the payback period on the initial capital investment for each of the five project participants. For Grocery Store D, the revenues, savings, and compactor cost were estimated using information received from local recycling organizations, garbage haulers, and equipment dealers.

A payback period is defined by the U.S. Environmental Protection Agency (EPA) as "the amount of time it takes to recover the initial cash outlay on the project" on a pretax basis (U.S. EPA, 1988). For low-risk investments, the EPA reported that a three- to four-year payback period is usually considered acceptable (U.S. EPA, 1988).

Table 2. Payback Period on Cardboard Recycling Equipment.

Grocery Store	Income from Cardboard Sales $/year	Savings on Disposal Services ($/year)	Capital Investment	Equipment Payback Period
A	$4,450	unknown	$4,000	< 1 Year
B	$ 650	$5,400	$3,000	6 Months
C	$1,050	$3,000-$5,000	unknown	unknown
D*	$2,200	$1,750	$15,000	3.8 Years
E	$5,450	$4,400	$16,500	1.7 Years

- Values are based on estimates if-cardboard recycling was implemented.

As shown in Table 2, the payback periods ranged from less than a year to almost four years for the balers and compactor containers. Grocery Store C has recycled cardboard since it was opened approximately seventeen years ago so the price of their baler was not known. The results of the analyses indicate that cardboard recycling is justified based on economic considerations as well as environmental concerns.

Conclusion

In general, grocery stores have excellent waste minimization opportunities. The largest waste stream generated by the stores investigated during this study was corrugated cardboard. Therefore, it is important that this waste stream be recycled to significantly reduce the amount of waste landfilled, as well as disposal costs.

It appears that in order for grocery stores to provide significant additional reductions in landfilled waste, manufacturers will need to modify their products' protective packaging to minimize waste production. Manufacturers should also use packaging materials which are recyclable and for which markets have been developed. Waxed cardboard boxes, wooden crates, shrink wrap, and most other types of plastics are not currently recyclable in Nebraska and, therefore, will continue to be landfilled until alternatives are found.

References

American Directory Publishing Co., 1990, “Nebraska business directory.

U.S. Environmental Protection Agency, 1988, “Waste minimization opportunity assessment manual,” EPA Report No. EPA/625/7-88/003, July.