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3. Implementation of the Tote and Bossy Systems. The final phase of the study will concern further modification of improved handling by implementations and study of

- a. the Clark tote in conjunction with the existing system of receiving, storage and display
- b. the Clark tote plus a dolly to move milk, etc. from the receiving point to storage and display in the supermarket
- c. the Clark tote and dolly used in conjunction with a modified display cabinet which allows the rolling totes to become part of the actual display

- d. "Bossy" system to receive store and display milk in supermarkets (includes a modified supermarket display case)

Evaluation of these systems will involve measures of sales, inventory and space as summarized earlier with emphasis on detailed time studies of various functions for component, if necessary.

When

The initial phase of the investigation has been completed and is in report form. The second phase will be underway by December. Completion date is set for spring 1973.

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## HANDLING SOLID WASTES IN SUPERMARKETS AND CONVENIENCE STORES

by  
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Study looks at various solid waste handling systems for supermarkets and convenience stores.

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Recent studies have indicated that the number one ecological problem of supermarkets is solid waste handling. One of the greatest needs is for better information and education among all levels of retail management to acquaint them with factual data on the alternatives available to them. An economic evaluation of existing methods for handling waste and returnables as well as the development of recommendations for systems that meet environmental requirements is urgently needed. Recognizing this problem, a project was initiated in June of this year to evaluate alternative waste handling

systems in supermarkets under contract with SCS Engineers, Inc.

Ten representative retail food stores were selected for study. The following criteria were considered in selecting the stores:

A. Average Weekly Sales Volume. Five are high volume stores with sales approximating \$100,000 each week and five are average volume stores with sales approximating \$40,000 each week.

B. Waste Paper Management Practices. Each of the five stores uses one of the following as the primary processing/disposal element of its waste handling system: (a) stationary compactor, (b) baler, (c) conventional incinerator, (d) "starved air" incinerator, (e) bulk storage containers.

C. Other Criteria. Stores were selected to be representative of supermarkets within their volume size and to be similar in terms of type of neighborhood served and hours of operation. Major associations were most helpful in providing waste related information and possible participating firms that might meet the selection criteria and cooperate in the study.

The stores were selected and the on-site investigations begun in July with the last surveys being completed this month. It is anticipated that the data analysis should be completed in three months. While it is not possible to report results of this project at this time, a brief summary of the types of information being collected may be of interest. This information includes:

#### I. Waste Paper

1. Waste paper material management practices: A detailed investigation will be made into the existing methods used to handle, store, and dispose of waste paper materials at each store. This includes time and cost data of the handling methods involved from the point where the case is emptied on the display floor to the point where it leaves the retailer's possession or has been destroyed.

2. Total annual costs: The total annual cost for handling waste paper materials will be developed at each store.

3. Weights and volumes of waste paper: The weights and volumes of the major types of waste paper materials will be determined.

4. Ecological effects of waste paper handling: The waste paper handling systems at each store will be evaluated to determine possible adverse ecological effects, if any. Beneficial ecological effects will also be identified.

5. Store operating data: Descriptive information on store size and operating characteristics will be assembled for correlation with waste paper handling systems being used.

6. Regulatory requirements: Information on local and state ordinances governing the storage, processing, and disposal of

solid wastes from retail food stores will be obtained.

#### II. Non-Paper Waste

1. Management practices: Management practices for the handling of all other waste materials will be obtained. Other types of waste include: (a) wooden boxes, (b) floor sweepings, (c) meat trimmings and spoilage, (d) produce trimmings and spoilage, (e) metal containers, (f) grocery waste from broken and/or spoiled merchandise, and (g) glass containers. At each store information will be obtained on the time requirements and costs attributable to handling of these waste materials. Weight, volume, and moisture and organic content of these waste materials will be obtained.

The handling of returnable (deposit) bottles has been estimated to cost the average Southern California supermarket about one cent per bottle. This significant cost plus the intense public interest in recycling of glass bottles has resulted in the inclusion of an evaluation of bottle handling practices and associated costs at the study stores.

#### III. Evaluation of Waste Management Systems

The information obtained from the investigation of the present methods of managing waste paper and other solid wastes in the ten retail food stores will be used as a basis for evaluation and comparison between the systems utilized at each of the stores and against alternative methods of waste management. In addition to comparing the store waste management systems with each other, the potential for applying new waste handling and disposal methods will be evaluated. These potential methods include (a) grinding, and disposal of produce waste to the sanitary sewer, (b) on-site waste volume reduction methods such as compactors, balers, and shredding machines, and (c) segregation for recycling.

#### IV. Guidelines and Recommendations

Guidelines and recommendations will be developed for the proper selection and use of waste handling and processing equipment in retail food stores. Using the guidelines, an improved waste management system for a

high volume and an average volume supermarket will be developed. The steps followed in deriving the improved system will be described in a step-by-step fashion including identification of the important factors and their quantitative values utilized in the process. Careful attention will be given to clearly identifying those factors which are applicable only to a given store location as contrasted to those having national applicability. Examples of the former include: (a) labor rates, (b) local ordinances, (c) salvage market availability and pricing structure, and (d) prevailing waste disposal charges and fees.

## V. Convenience Stores

A separate study is being conducted by the University of Delaware to evaluate waste disposal problems of convenience stores, and will be completed next summer. This study will determine the types, volume and weight of solid waste accumulated, the systems used for disposal, and the costs and problems associated with waste handling for small retail food stores. Recommendations and guidelines for solid waste handling procedures in convenience type food stores will be developed. Consideration will be given to store size and systems that are economically efficient and ecologically sound.

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# CONSOLIDATED ORDERING AND DELIVERY SYSTEMS FOR SMALL RETAIL FOOD STORES

by  
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Provides a look at current practices used in supplying small stores and future work will result in proposals for alternative supply systems.

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The supply system for small retail food stores is presently characterized by numerous deliveries of low wholesale value, poorly coordinated merchandise receiving practices, and a large number of orders and invoices. The typical small convenience type store may have sales approximating \$4,000 per week and yet have more than 70 trucks making deliveries to it in the course of a week. Many of the delivery trips occur during the morning rush hour and contribute to suburban and urban traffic congestion.

Most of the deliveries made by these different suppliers are small in size and have a low wholesale value. Many have a

wholesale value of less than \$20 and for some product categories the delivery costs may represent between 25 and 35 percent of the wholesale dollar value. The wholesaler's distribution system is usually designed to achieve economies of size in assembling and delivering supermarket orders. The general line wholesaler will reluctantly serve the convenience store, but usually adds a service charge for handling the smaller higher cost order.

Receiving and handling of the merchandise at small stores appears to be poorly timed, creates confusion, encounters unnecessary delay, and invites pilferage. Many vendors arrive during a busy customer shopping period, congesting the parking lot, experiencing delay getting into the store and getting orders checked. Current order processing methods for some commodities appear to require an inflated lead time and excessive store personnel order time.