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A COST COMPARISON OF TWO BREAD DELIVERY SYSTEMS

By

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The author compares cost factors for the drop and driver-seller bread delivery systems.

INTRODUCTION

The commercial delivery of bread started in the 19th century with door-to-door deliveries using a horse and wagon. Through the years this slowly changed to delivery of a variety of bakery and other vendor items to retail food stores. After World War II the large supermarket chains emerged with their economies of scale, and often built their own bakeries and delivered bakery products to their own stores. In many instances the independent baker has been practically "shut out" of the major chains' bakery department sales and consequently a major share of the bakers volume is through independent supermarkets, smaller stores and institutional outlets. Bread companies must find ways to more efficiently compete in the marketplace.

OBJECTIVES

The objective of this research was to determine the costs of the two major systems that bread companies presently use to deliver bread items to their customers--the drop delivery and driver-seller systems. By identifying the lowest cost system, bread companies may

become more competitive and efficient. This research was conducted on two systems of bread distribution from bakery to retail store where data were obtained on labor, equipment and material costs for obtaining the retail order, order assembly, truck loading, and delivering to retail outlets.

METHODOLOGY

Bread companies may use two different systems of delivery based on the size of customers orders and facilities. For larger bread volume customers, such as supermarkets and large retailers, some bakeries use a drop delivery system with orders determined by telephone and individual customer orders assembled at the plant warehouse and delivered to the store on mobile carts. Other bakeries use a driver-seller system of delivery; the truck is a rolling warehouse and the driver-seller determines customer's needs at the time of delivery. This method is widely used for serving stores with smaller bread volume.

This study was conducted in cooperation with a bread company that used both the drop delivery and driver-seller delivery systems for local delivery of bread products to urban and suburban customers. Cost for labor was furnished by the bakery; equipment and materials costs by equipment suppliers.

In addition to conducting in-plant studies of order assembly and delivery truck loading, researchers accompanied drivers on eight delivery trips. The researchers recorded methods used and time--in hundredths of minutes--required to perform the various tasks associated with each system.

For the purpose of this study only comparable functions of the two systems were examined. For example, shelf stocking, not a function of the drop delivery system but a function of the driver-seller, is not compared in the cost analysis.

The following assumptions are made based on the experiences of the company in the study:

1. Truck load averages 2,500 loaves on 18 mobile carts with the drop delivery system; and 2,400 loaves loaded, and 2,250 delivered, with the driver-seller system. During the study, it was found that load size ranged from approximately 2,000 to 3,000 loaves with the drop delivery system and from 2,200 to approximately 2,400 with the driver-seller system.
2. Delivery trip averages 10 stops for the drop delivery with a range of 6-14 per trip. A delivery trip averaged 25 stops for the driver-seller system with a range of 21-27 stops per trip.
3. Order size per stop averages 250 loaves for the drop delivery system and 90 loaves for the driver-seller system. Not all the loaves were sold that were loaded on the driver-seller trucks. For drop delivery, order size ranged from under 100 loaves to over 500 loaves per stop and for the driver-seller, from under 20 to over 130 loaves per stop.
4. Eighteen mobile carts are used to transport product from truck into store with the drop delivery system. A collapsible two-wheel delivery

cart is used to transport product from truck into store with the driver-seller system.

5. Round trip delivery distance for both systems is assumed to be 50 miles.

DESCRIPTION OF SYSTEMS

In the drop delivery system, a company employee at the distribution warehouse telephones customers to determine their bakery order. After the calls are completed, an order sheet is prepared for each delivery trip showing the number and variety of items for each customer. Each customer gets five deliveries per week.

Orders are assembled the afternoon before the scheduled delivery. Empty mobile carts representing each delivery stop are arranged in the order assembling and loading area. An order sheet for each stop is placed on the cart. The order assembler checks the first item and quantity needed on the sheet, gets a cart of that item from the storage area, moves it to the customers' carts, and fills the orders by placing a tray with that item in the customers' cart. The assembler will place all of the orders for one item on customer assigned carts before starting the same process for the next item on the order sheet.

Truck loading is usually performed in the early morning of the day of delivery with the driver loading the truck. The customers' cart or carts loaded first are the the last store on the route and the last cart or carts loaded are for the first stop.

After the truck is loaded, the driver begins his deliveries. At each stop the driver removes the approximate number of carts from the truck, using a power-operated liftgate at stores without truckbed level docks, and transports them into the store. Store personnel check the order and either unload the

cart, if time permits, or move it into the store room. "Out-of-code" items are checked by the store for credit before being taken to the truck. Empty carts from the previous delivery are transported from the store to the truck by the driver and secured by a brace bar in the truck.

With the driver-seller system, the driver prepares an order showing the anticipated bread needs for the next delivery trip. The order is assembled by a member of the loading crew by obtaining a cart-load of the first item needed and placing trays of product in the truck. This procedure is followed for each item listed on the order. Frequently, the loader needs more than one cart for a particular item. Partially filled carts are returned to the storage area and another cart with the next item needed is moved to the truck.

During truck loading, items are placed in designated areas of the truck to facilitate item location during delivery. Loaders will leave space in the truck for the drivers to place returns ("out-of-code" product). Loading is usually performed the afternoon before the scheduled delivery trip.

At each delivery stop the driver enters the store, determines shelf needs, removes out-of-date merchandise, writes the order, and returns to the truck. At the truck, the driver removes a collapsible two-wheel delivery cart from the rear of the truck, opens it, and places trays of bread on it. The driver returns to the store, has store personnel verify the order count, stocks the shelves, and checks "out-of-code" items for credit before they are taken to the truck. At the warehouse, "out-of-code" bread is made into croutons or sold to contract buyers. The driver usually returns with approximately 6 percent (15 trays) of the 2,400 loaves loaded on the truck.

Many retailers like this system because the distributor does the work, determines the order, delivers the order and restocks the shelves. It is the old

way of doing business and many retailers would resist changing to the drop delivery.

RESULTS AND CONCLUSIONS

Table 1 shows the total labor, equipment, and material costs per trip for the two delivery systems. Total cost was \$95.06 or \$0.0380 per loaf delivered for the drop delivery system (10 stops per trip), and \$106 or \$0.0471 per loaf delivered for the driver-seller system (25 stops per trip). Labor cost at the delivery stop and truck cost were the two major cost items, accounting for 73 percent of the total cost of the drop delivery system and 80 percent of the total cost of the driver-seller system.

The labor cost to prepare the invoice was \$5.08 for the drop delivery system and \$5.78 for the driver-seller system. In the warehouse, labor, equipment, and material costs were less for the driver-seller system than for the drop delivery system. Order assembly and truck loading (\$7.16 per load), required more time and nearly doubled the cost of loading activity of the driver-seller system (\$3.80 per load).

More time is spent at the delivery stop to deliver a loaf of bread with the driver-seller system than the drop delivery system. At the retail stop it took the drop delivery driver 3.83 hours to deliver 2,500 loaves of bread compared to 5.58 hours for the driver-seller to deliver 2,250 loaves. The number of loaves delivered per hour was 652 for the drop delivery system and 403 for the driver-salesman system. Because the driver-seller had relatively small orders per stop, a slower delivery system at each stop, more stops per trip, and a higher truck cost per trip, cost per loaf was greater with this system (\$0.0471 per loaf compared to \$0.0380 per loaf for the drop delivery system).

The equipment and material cost for each system was a smaller cost-item than

TABLE 1. TOTAL LABOR, EQUIPMENT, MATERIAL AND TRUCK COST FOR THE TWO DELIVERY SYSTEMS

Cost	Drop Delivery	Driver-Seller
- Dollars -		
Determine order:		
Labor	5.08	5.78
Order assembly: ^a		
Labor	4.31	--
Equipment	.39	--
Materials	.08	--
Load truck:		
Labor	2.12	3.74
Equipment	.18	.02
Materials	.08	.04
Delivery stop:		
Labor	24.89	36.27
Equipment	2.10	.05
Materials	.89	.67
Travel time: ^b		
Labor	8.90	10.53
Equipment	.75	.01
Materials	.28	.19
Delivery truck	45.01	48.70
Total cost	95.06	106.00
Cost per loaf ^c	.0380	.0471

^aBased on 2,500 and 2,400 loaves for drop delivery and driver-seller delivery systems, respectively.

^bTravel time was 1.37 and 1.62 hours for the drop delivery and driver-seller delivery systems, respectively. Labor, equipment, and material costs calculated from these figures.

^cBased on 2,500 and 2,250 loaves of bread sold for the drop delivery and driver-seller delivery systems, respectively.

labor. For the drop delivery system, equipment and material cost accounted for nearly 5 percent of the total delivery cost and for the driver-seller system equipment and material cost accounted for nearly one percent. The use of mobile carts in the drop delivery system was the main equipment cost item.

Delivery vehicle cost made up between 43-46 percent of the total identified costs of the drop delivery and driver-salesman delivery systems.

Implications

Assuming retailers could receive their orders by either system, it would be to the advantage of the bread distributor to use the drop delivery system to service them. The potential savings to a distributor by adopting the drop delivery system would depend on the number of deliveries and system or systems now being used. Also assuming a distributor delivered bread 5 days a week with 10 truck deliveries per day by the driver-seller system, a potential savings of over \$28,000 annually could be realized by converting entirely to drop delivery. Savings to the industry could range between \$1-2 million annually.

There are instances when the driver-seller system may be more efficient. If retail storage facilities are limited and orders are very small, there may be an advantage to use the driver-seller system.