DIRECT LABOR AND MATERIAL COSTS IN RETAIL APPLE MERCHANDISING AND ACTIONS OF CUSTOMERS IN PURCHASING APPLES, COLUMBUS, OHIO, 1955

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FOREWORD

Beginning with the 1954 apple crop a study was started to determine ways of increasing the efficiency of marketing apples under Ohio conditions. The areas of study under way include packaging costs at various levels in the marketing channel and under different scales of operation, comparison of labor and material costs under different methods, and an appraisal of marketing systems in use or possible under Ohio conditions.

A previous publication reports on the farm cost of packing apples under different methods and in different size units as well as information on delivery time and machinery investment. 1/

1/ Labor and Material Costs and Machinery Investment in Apple Grading and Packing, 30 Ohio Apple Growers, 1954-1955, A. E. Mimeograph 256, The Ohio Agricultural Experiment Station and The Ohio State University.

SUMMARY

1. Direct labor and material costs for merchandising apples from bulk displays in retail stores were slightly over 28 cents per bushel. This cost included only the labor spent in preparing and maintaining the display and waiting on customers and the materials for packaging the apples at the time of sale.
2. Comparable costs for merchandising apples which were prepackaged in the store were about 42 cents per bushel while for apples which were prepackaged at the farm or at some point prior to the store the cost was only 4 cents.
3. A high relationship existed between the percentage that prepackaged apples took of the apple display area and the percentage of apple sales which were prepackaged.
4. The average purchase of prepackaged apples was 3.6 pounds compared with the average bulk purchase of 2.5 pounds. The 60 percent of the customers who bought prepackaged apples bought 68 percent of the apples.
5. Customers required 19 seconds for a purchase of prepackaged apples and 48 seconds for purchasing apples from the bulk display.

DISCUSSION

The decision of whether to merchandise apples in prepackaged retail displays depends on many factors, some of which were not included in this study. The relative importance of each of these factors varies among individual retail stores depending on customer and retailer practices and preferences.

Prepackaging enables retailers to take advantage of:

1. Possible economies in clerk time especially at peak traffic periods.

2. Possible economies in display space and/or customer time for making purchase -- serve more customers in a given period of time with prepackaged fruit.

3. Quality and apperarance improvements and reduction in waste possible through film covering and reduction in handling by customers.

Once the decision is made on whether to merchandise prepackaged or bulk apples, the question of where they are to be prepackaged remains. Under Ohio conditions apples can be packaged at any level from the farm through the retail store with satisfactory apple quality. The place at which prepackaging will be done depends largely on the estimated possible economic advantage of packaging at one level over another. The major pertinent factors determining this are:

1. Wage rates at various levels.

2. Output per worker at various levels.

3. Availability of "surplus" or "spare time" labor at retail that can be used for packaging at store level.

4. Convenience to retailer of merchandising already prepackaged vs. store packaging.

5. Other factors -

(a) Relative amount of overweight in bulk bushel vs. prepackaged product and who bears cost or gains from it -- with apples valued at 10 cents a pound wholesale a very few extra pounds can offset higher

costs to buyer or a few more pounds given by seller may offset the added costs of selling in a prepackaged form.

(b) Quality and waste in marketing channels for each method.

The fact that different retailers use and prefer different methods of obtaining and merchandising apples suggests the probability that the advantages of each of these methods differ among stores or that possibly the retailers are not fully aware of the differences in costs among the methods available. It is hoped that this report will assist retailers in deciding on the least costly method of merchandising that will suit their conditions and will in turn improve the marketing of Ohio apples.

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R. L. Bere and M. E. Cravens 1/

Introduction

The most costly and probably the least understood phase of apple marketing is the retailing operation. This function takes from about one-fourth to one-third of the retail apple dollar, which is frequently more than goes to the grower.

This is a preliminary report of a phase of the study aimed at comparing direct labor and material costs for different methods of moving apples through retail stores.

The retailer must anticipate the demands of his customers for apples, and merchandise then until they are bought. Waste due to errors in buying judgment, poor quality and the nature of the product must be absorbed by the retailer. The retailer, the grower and the consumer should all benefit from increased efficiency in the retail operation. This report covers the direct labor and material costs involved in moving apples from the back room of the retail store to the customer. The methods used in performing this job were:

1. Bulk - an unpackaged display of apples where fruit is dumped from the original (usually one bushel) container onto a display table or rack. The customer's purchase is weighed and priced at the time of sale.

1/ Research Assistant and Associate Professor respectively, Department of Agricultural Economics and Rural Sociology.

2. Prepackaged in the store - the apples are packaged, weighed and priced in the store prior to purchase.
3. Prepackaged prior to store delivery (packaging done at farm or wholesale level) - the store must price the package and put the apples on display.
4. Any combination of the above methods.

The relative importance of these methods has varied greatly since prepackaging was started, but the merchandising of apples in transparent film bags (consumer packages) has increased greatly in importance in recent years. The main questions concerning this method of retailing are (1) what is its effect on the sales of apples? (2) what are the costs involved in merchandising apples by this method and how do they compare with those of other methods? and (3) where can the packaging be done the cheapest?

The study was conducted in ten supermarkets in Columbus during January-March of 1955. Observations were made of the time spent setting up and maintaining displays, waiting on customers and packaging apples in consumer packages. The amount purchased by approximately 1300 customers and the number of seconds required for each purchase were also recorded.

Each period of observation was approximately three hours. A total of eight to ten observation periods were used in each store over a period of eight weeks. The observations were distributed so that no store was visited twice at the same time on the same day of the week.

LABOR AND MATERIAL COSTS OF VARIOUS METHODS OF MERCHANDISING APPLES

During the periods observed, about 2,800 pounds of prepackaged apples and over 1,300 pounds of bulk apples were sold. About 400 pounds of the prepackaged apples sold were prepacked at the farm while the remaining 2,400 pounds were prepackaged in the store. During the observations of the prepackaging operation in these stores about 6,000 pounds of apples were prepackaged. 1/

A. Bulk

In this method of sale the apples were delivered in bushel containers. They were moved from the backroom to the display and dumped or placed on the display by the clerk. The customer normally selects the apples and quite frequently puts them in a paper bag before taking them to the scales where the clerk weighs and price marks the apples.

Direct labor and material costs for the retail selling of apples from bulk displays were slightly over 28 cents per bushel (Table 1). This cost included only direct labor and material costs incurred from the time the apples were in the backroom of the store until they were placed in the customer's cart. All labor involved in setting up and maintaining the display and in serving the customer at the time of purchase as well as the materials for packaging the apples at the time of sale were included. The 28 cents does not include such additional charges as unloading from the warehouse truck, check out labor, managerial time, overhead expenses, unproductive time on the part of workers and other miscellaneous costs.

1/ Observations were not made simultaneously in the sales part and in the back room of the store. Each area was sampled separately.

TABLE 1: COST OF DIRECT LABOR AND MATERIAL IN RETAIL MERCHANDISING A BUSHEL OF APPLES BY THREE METHODS, COLUMBUS, OHIO, 1955

Cost Item	Method of Merchandising					
	Packaged Prior to Store		Packaged in Store		Bulk	
	Cents Per Bushel	Minutes Per Bushel	Cents Per Bushel	Minutes Per Bushel	Cents Per Bushel	Minutes Per Bushel
Prepackaging	-	-	23.1¢	11.1	-	-
Setting up Display	4.2¢*	2.0	3.9	1.9	12.7¢	6.1
Serving Customers	-	-	-	-	12.5	6.0
Materials	-	-	15.0	-	3.0	-
Total	4.2¢	2.0	42.0¢	13.0	28.2¢	12.1

* This does not include price marking the display or bags in farm packaged apples.

Of the 28 cents cost per bushel for direct labor and materials, 25 cents (almost 90 percent) was for labor. About 13 cents was spent for clerk labor in setting up and maintaining the display. Twelve cents was spent for the labor of weighing and pricing the apples at the time of purchase, while the other three cents was for materials. The hourly rate used in calculating labor expenses for all operations was $1.25 per hour.

B. Prepackaged in the Store

Almost 60 percent of the apples sold during the period of study were prepackaged after delivery to the store in transparent film bags of variable weights from two to five pounds. These apples were received in bushel units after which they were prepackaged, weighed and priced by regular clerks or part time help prior to the time of display. The customer then performed the remainder of the job. The average direct labor

and material costs in merchandising apples by this method was about 42 cents per bushel or 14 cents more than for the bulk method. Of this difference, 12 cents was due to higher material costs and two cents for extra labor.

The cost of setting up and maintaining the display of prepackaged apples was about four cents per bushel as contrasted to almost 13 cents for maintaining the bulk display. There was no measurable cost for clerk labor at the time of customer purchase of prepackaged apples.

Direct labor in packaging, weighing and price marking a bushel of apples in transparent film bags cost approximately 23 cents. This expense compares with less than 13 cents where customers served themselves from bulk displays and often placed the apples in bags before taking them to the scale. The only clerk labor involved in many bulk sales at the time of the sale is in weighing and marking the price.

Costs of bags, labels and closures for store prepackaging were about 15 cents per bushel compared with three cents for bulk apple packaging materials.

C. Prepackaged Prior to Delivery at the Store

About 10 percent of all apples sold during the study were prepackaged at the farm and delivered directly to the store or warehouse. In this type of merchandising, the expense of labor and materials for prepackaging is borne by the farmer or packer. The only merchandising expense to the store is maintaining the display and price marking the bags. In most cases the pricing was accomplished by a centrally located sign in the display, although in a few cases each individual bag was price marked.

The bags in each master container purchased were all of the same weight so there was no cost of weighing.

The cost of setting up and maintaining a display of farm prepackaged apples was about four cents per bushel. Where the bags were individually price marked, the labor of pricing bags cost about two cents additional per bushel but if the display was centrally price marked, there was very little additional charge for pricing. The labor of displaying the farm prepackaged apples was about the same as for store prepackaged apples.

SALES OF PREPACKAGED AND BULK APPLES

Over 1300 individual purchases of apples were observed during the study (Table 2). Of these, approximately 800 or 60 percent were of prepackaged apples. The prepackaged apples, however, accounted for almost 70 percent (2830 pounds) of the total volume of apples sold.

TABLE 2: VOLUME AND NUMBER OF PURCHASERS OF PREPACKAGED AND BULK APPLES, BY INDIVIDUAL STORE, COLUMBUS, OHIO, 1955

Store	Prepackaged Apples		Bulk Apples		Total Apples	
	Percent of Volume Sold	Percent of Total Customers	Percent of Volume Sold	Percent of Total Customers	Total Volume Sold	Total Customers
	%	%	%	%	lbs.	number
1	27	23	73	77	202	69
2	88	71	12	29	441	145
3	83	78	17	22	428	122
4	90	82	10	18	371	112
5	77	70	23	30	547	169
6	65	56	35	44	233	78
7	91	84	9	16	328	92
8	86	76	14	24	467	157
9	32	23	68	77	822	276
10	53	42	47	58	314	99
Total and Average	68	60	32	40	4153	1319

The average purchase of prepackaged apples was 3.6 pounds per customer while purchases of bulk apples averaged only 2.5 pounds per customer (Table 3). Bulk purchases were in smaller units than those of prepackaged apples in each store. The average purchase of prepackaged apples ranged among the 10 stores from 3.1 pounds to 4.1 pounds while the average bulk purchase of apples ranged from 1.7 pounds to 2.9 pounds.

Customers required only 19 seconds in making a purchase of prepackaged apples while it took 48 seconds to purchase bulk apples. The extremes among the 10 stores in average customer purchase time ranged from 13 to 23 seconds for prepackaged apples and from 37 to 62 seconds for bulk purchases. On the average the customer required over three times as long to purchase a pound of apples from bulk as from packaged displays. This fact no doubt has helped increase the use of prepackaging in the entire produce department where congestion is a major problem.

Not only did three out of every five cutomers purchase prepackaged apples, but it took only 12 customers to buy a bushel of prepackaged apples compared with 17 customers to buy a bushel of apples from the bulk display. This, however, reflects to some extent the fact that the prepackaged units were larger than those preferred by many customers. Customers who purchased only a small amount of apples at a time (one pound or thereabouts) generally had to patronize the bulk display or ask the clerk to break open a larger package. The amount of customer time required to purchase a bushel of apples from the bulk display was 13.5 minutes as compared with less than four minutes for a bushel of prepackaged apples.

TABLE 3: PURCHASES OF PREPACKAGED AND BULK APPLES AND TIME REQUIRED FOR PURCHASES, BY INDIVIDUAL STORE, COLUMBUS, OHIO, 1955

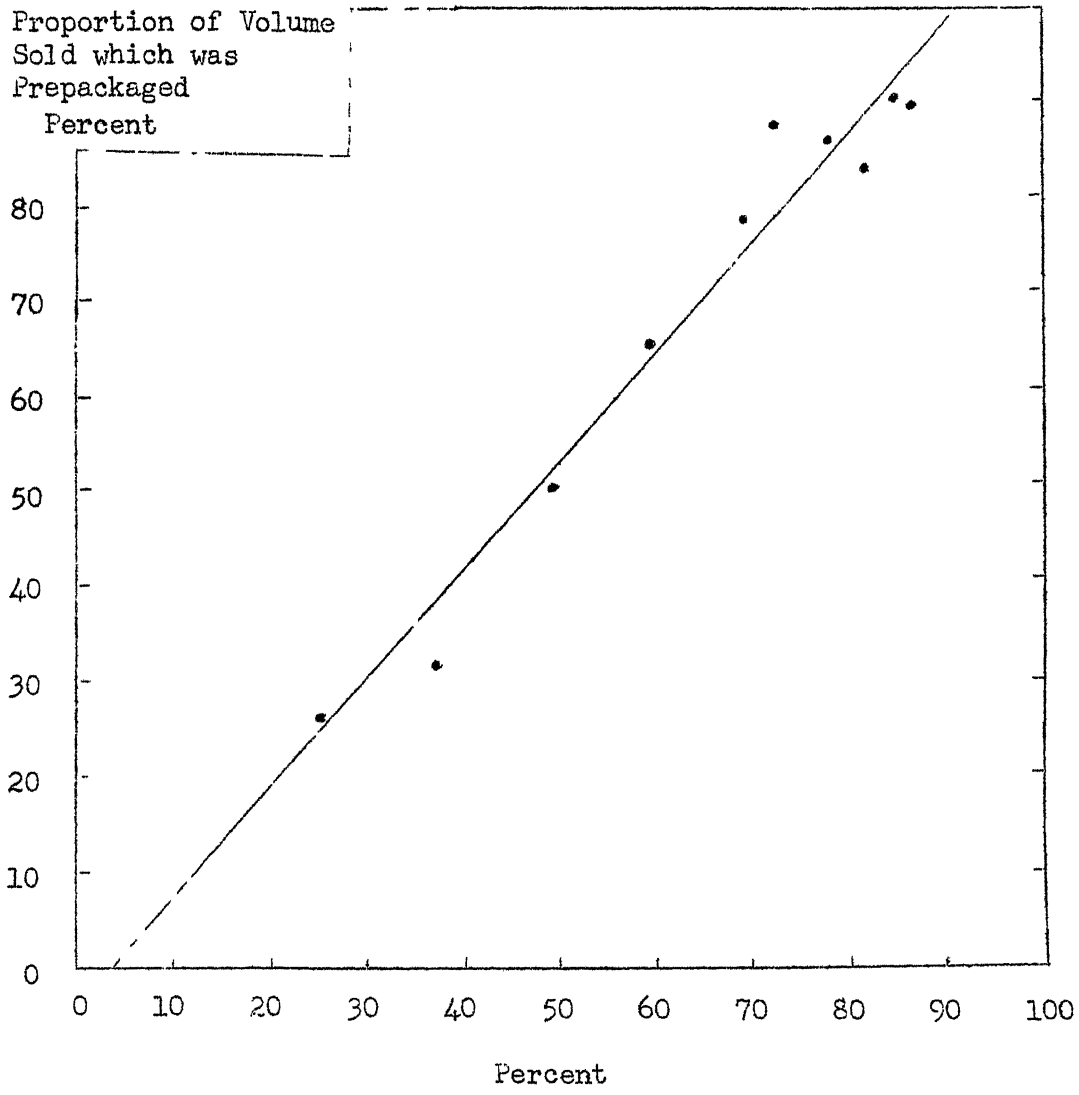
Store Number	Prepackaged Purchases				Bulk Purchases			
	Average Size		Time Required		Average Size		Time Required	
	Value	Weight	Clerk	Customer	Value	Weight	Clerk	Customer
	¢	lbs.	sec.	sec.	¢	lbs.	sec.	sec.
1	$.43	3.4	5.5	14	$.46	2.9	31	37
2	.45	3.1	*	21	.36	2.7	20	59
3	.45	3.5	*	18	.34	2.7	24	62
4	.46	3.7	*	20	.24	1.9	27	42
5	.46	3.7	*	22	.38	2.5	25	61
6	.48	3.4	2.7	14	.41	2.4	24	39
7	.49	3.9	*	20	.38	2.0	24	56
8	.50	3.4	*	13	.29	1.7	17	45
9	.52	4.1	*	17	.40	2.7	19	45
10	.53	4.1	*	23	.38	2.7	18	59
Total	$.47	3.6	*	19	$.38	2.5	21	48

* less than 0.5 seconds

Considerable variation was found among stores in the predominant method of merchandising. Prepackaged apple sales ranged among stores from less than 30 percent to as high as 91 percent of the total volume sold. The importance of prepackaged apple sales as a percentage of the total volume sold was very closely correlated to the percentage of the display area devoted to prepackaged apples (Figure I). There are two possible reasons why this is true.1/ One of these is that an efficient produce manager knows a great deal about the probable reactions of his customers to prepackaged apples. He will tend to give prepackaged apples display space on the basis of their expected sale. If this be the case, then we would expect to find the relative importance of prepackaged apple

1/ The correlation between the percentage of display area and percentage of total volume sold in +.9767.

FIGURE I: RELATIONSHIP BETWEEN PERCENTAGE OF APPLE DISPLAY DEVOTED TO PREPACKAGED APPLES AND THE PERCENTAGE OF THE STORE APPLE SALES WHICH WERE PREPACKAGED, 10 COLUMBUS STORES 1/



Proportion of Apple Display Area Devoted to Prepackaged Apples

1/ Predicting Equation = $Y_c = -2.474 + 1.115x$
Coefficient of Correlation = +.9767

sales commensurate with the percentage of the total apple display area devoted to prepackaged apples.

The other reason for the close correlation between display area and relative volume of prepackaged apples sold is that the size of display has an important effect on sales. Studies at Michigan found that a 10 percent increase in the normal apple display area resulted in an increase of 6 percent in apple sales. It would appear logical then that as the percentage of the display area devoted to prepackaged apples increased the percentage of the total sales which were prepackaged would also increase within reasonable limits. In all probability, the high correlation between these factors is a combination of both the reasons just listed.