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TRANSPARENT EGG CARTONS VS.

PAPER CARTONS

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Transparent Egg Cartons vs. Paper Cartons

NORMAN NYBROTEN

Introduction

DURING recent years, plastic materials, often at increased cost, have become more common in packaging different food items. Logically, food merchandisers who have adopted a more expensive container must have done so under one or more of the following conditions: (a) there has been an offsetting gain in efficiency of handling the product; (b) the more expensive container gives better protection to the product; (c) the more expensive container attracts more volume and increases the demand for the product usually including the container; (d) the food merchandiser has no real choice in selecting the food container because other factors to be desired can not be separated from the expensive container; (e) the food merchandiser has analyzed the economics of the situation in a manner which gives him an incorrect conclusion or his choice may be based on noneconomic consideration.

The one-dozen plastic egg carton has been developed to a point where it might feasibly be considered as an alternative for paper egg cartons. In 1955, plans were made for testing consumer acceptance of plastic egg cartons in West Virginia, but suitable cartons were not available.

Tests have been made of consumer and shopper attitudes toward these cartons in New York¹ and Maine.² In matched-lot experiments (eggs in plastic vs. eggs in paper cartons) in these states more eggs were sold in plastic than in paper cartons. From these experiments it was also concluded that total egg sales, for the stores in which experiments were conducted, were increased by the introduction of plastic cartons.

Matched-lot experiments are not designed to measure the effect of a substitute innovation on total sales. Methods other than matched-lot were to have been used in the West Virginia experiment *after* the matched-lot experiments were completed.³ The results of the different matched-lot experiments in West Virginia, however, were such that it did not seem necessary to test by other methods.

¹Darrah, L. B. and E. M. Moore, *Egg Merchandising in Supermarkets. Part V-Transparent Egg Cartons*, A. E. 1012, Department of Agricultural Economics, Cornell University, Ithaca, N.Y., April 1956.

²Saunders, Richard, *Transparent Plastic Cartons Boost Egg Sales*, Maine Agricultural Experiment Station Bul. No. 547, Orono, Maine, March 1956.

³Nybrotten, Norman, "Rate of Commodity Disappearance and Consumer Preference," *Journal of Farm Economics*, Vol. XXXI, No. 2, May 1949.

The Study Method

EXPERIMENTS

Three phases of matched-lot relationship were conducted in three stores in Parkersburg, West Virginia, over a 16-week period. This tripling of stores was made so as to increase statistical validity. In two of the stores there were two classes of eggs (high-quality branded eggs along with unclassified) and two types of paper cartons. The branded egg were not offered in the third store. The quality and size of eggs and the type of carton were controlled during the experiment. The experimental phases were in the following order.

Deposit phase. In this phase a deposit of 10 cents (on the plastic carton) was taken. A label was inserted into each egg carton, indicating price of the eggs, amount of deposit, and the total of the two.

Differential phase. In this phase of the experiment attention was called to the difference in costs of cartons, and the additional cost of the plastic carton was charged to the customer. In all stores 4 cent premium was charged for the plastic carton over the 3 x 4 paper carton. In two stores, which had a higher-priced egg in a branded 2 x 6 carton a premium of 3 cents was charged for the plastic over the 2 x 6 paper carton. In each case, these premiums were (to the nearest cent) the actual difference in cost of cartons. Slips were inserted into the plastic cartons showing the price of eggs, the carton premium, and the total price. A banner over the display called attention to the fact that the same class or grade of eggs was packed each way, and that the carton was the only difference. The three types of cartons are those shown in the picture on the cover page.

Same-price phase. In this phase each class of eggs was available at the same price in either the plastic or paper carton. There was a banner to show that there was no deposit nor premium charged for eggs in plastic cartons. Customers had been alerted during the previous twelve weeks in which the deposit and price-differential phases had been in operation. Again, real effort was made to convince customers that there was no difference in the eggs offered in the two types of cartons.

This phase was repeated in one store in Morgantown, West Virginia, except for two principal differences: (a) the customers had not been alerted by prior experiments, and (b) there was no banner calling attention to the fact that the two types of cartons contained eggs of the same class. Medium and large eggs, unclassified but controlled as to quality, were offered in this experiment. Equal display was given to each type of carton.

Opinion Survey

In Charleston, Clarksburg, Morgantown, and Parkersburg, West Virginia, homemakers selected at random were visited at their homes and were asked which of three egg cartons (plastic 2 x 6, paper 2 x 6, or paper 3 x 4) they would prefer if they could buy eggs in any one of the cartons at the same price.

The Study Results

EXPERIMENTAL PHASE

Figure 1 shows results of the three experimental phases in the three Parkersburg stores. As compared with sale of eggs in paper cartons, there was no statistically significant difference in the relative sale of eggs in plastic cartons either when a deposit on the plastic carton was required or when an extra charge was made for the increased cost of plastic. *In both of these phases the sales in plastic were too low to offer any promise from the economic standpoint.*

Saunders⁴ reported that in the Maine experiments 56 percent of the eggs were sold in plastic under conditions of no price difference between the cartons. About 16 percent of the eggs were sold in plastic cartons in the three-store study in West Virginia, and 47 percent in New York State. Although excellent cooperation was received from retailers in the West Virginia experiment, some of the clerks in the stores held an adverse attitude toward the plastic carton. For example, at times plastic cartons did not receive the fully allotted space in the display. This may have depressed sales of eggs in plastic cartons. If this was the case, then it is possible that a favorable attitude toward plastic cartons on the part of clerks could boost sales in plastics.

Except for the deposit-phase forerunner and the special efforts to alert customers in the West Virginia experiments, the experimental design of the price-differential phase compares with relevant parts of the experiments in the other states. Results, however, are very different. In the three West Virginia stores, less than 4 percent of the eggs were sold in plastic cartons, compared with nearly half in Maine and about the same general ratio in New York, excepting the part of the New York experiment in which a 5-cent premium was charged for eggs in plastic cartons. In this part of the New York experiment sales in plastic cartons accounted for about one-sixth of the total.

The experiment in Morgantown, having no precursory phases of carton deposit nor differential carton charge, yielded results somewhat

⁴*Ibid.*

FIGURE 1. Relative sales of eggs in plastic vs. paper cartons in three super-markets with three different price relationships between eggs in the two cartons.

nearer those obtained in Maine and New York. (See Table 1.) Even in this experiment, however, daily sales of eggs in plastic cartons were rather consistently smaller than sales in paper cartons. This same result held for both medium and large eggs and also for both 3 x 4 and 2 x 6 paper cartons. Not only were the sales of eggs in plastic cartons lower than sales in paper cartons—but there also was no time trend toward accepting the plastic carton by the majority of the customers.

TABLE 1. RESULTS OF A MATCHED-LOT RETAIL EXPERIMENT OF PLASTIC VS. PAPER EGG CARTONS, WITH NO PRICE DIFFERENCE BETWEEN CARTONS, MORGANTOWN, WEST VIRGINIA, 1957

WEEK (INDICATED BY MONTH AND DAY)	PERCENTAGE OF EGGS SOLD IN PLASTIC CARTONS		
	MEDIUM SIZE	LARGE SIZE	BOTH SIZES
10-2 —10-5	—	42.0	42.0
10-7 —10-12	—	44.0	44.0
10-14—10-19	54.0	—	54.0*
10-21—10-26	42.9	34.1	39.8
10-28—11-2	43.4	41.0	42.1
11-4 —11-9	40.0	39.5	39.8
11-11—11-16	40.6	30.4	36.1
11-18—11-23	40.5	36.7	37.8
TOTAL	43.8	39.2	41.2

*This week the experiment was inadvertently confounded. Large eggs appeared only in paper cartons for 2 days. If egg sizes were disregarded, 44.7 percent were sold in plastic and 55.3 per cent in paper. On the two days of this week during which types of cartons were completely matched-lot, 45.2 percent of the eggs sold were in plastic cartons and 54.8 percent in paper cartons.

SURVEY PHASE

Results of the opinion surveys in West Virginia differed from the opinion surveys in the other two states less than the results of the West Virginia experiments differed from the results of the experiments in those states. Homemakers interviewed in West Virginia expressed a fair amount of enthusiasm for the plastic carton. (See Table 2.) In West Virginia 51 percent of the respondents expressed a preference for the plastic carton, compared with 71 percent in Maine and 62 percent in New York. In New York this preference might have been higher if the "plastic-top" carton had not been presented as an alternative. It might be that the lower preference in Morgantown and Parkersburg indicates a decline in preference upon being better informed—experiments had been run in both of these cities. Various reasons were given for their preference or lack of preference. Their principal reason for choosing the plastic carton was usually that they liked to be able to see what is in the package.

TABLE 2. NUMBER AND PROPORTION OF SURVEY RESPONDENTS IN SELECTED WEST VIRGINIA CITIES CHOOSING TYPES OF EGG CARTONS, 1957

TYPE OF CARTON	CHARLESTON		CLARKSBURG		MORGANTOWN		PARKERSBURG		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%
plastic	85	57.1	72	55.8	108	49.5	129	46.2	394	50.8
x 6 paper	27	18.1	14	10.9	32	14.7	27	9.7	100	12.9
x 4 paper	14	9.4	28	21.7	58	26.6	95	34.1	195	25.2
no difference	23	15.4	15	11.6	20	9.2	28	10.0	86	11.1
All Types	149	100.0	129	100.0	218	100.0	279	100.0	775	100.0

The West Virginia opinion survey postulated that the plastic and the paper cartons were the same price. This postulation seemed rather unrealistic to many of the respondents, and their attitude indicates that in the same-price phase of the store experiments, customers might not believe they were getting the plastic carton for the same price as the paper carton, despite efforts to show there was no extra charge. On the other hand—in experiments charging a premium for eggs packed in the plastic carton compared with eggs packed in paper cartons—the customer might have assigned the difference in price (and value) to difference in eggs rather than to difference in cartons. This could account for the fact that Saunders,⁵ in his Maine experiment, found as large a percentage of eggs sold in plastic at a 5-cent premium for plastic as were sold at a 3-cent premium. Actually his study showed a slightly greater percentage of sales in plastic at a 5-cent premium than at a 3-cent premium—which might indicate that egg customers attributed the price difference to egg quality rather than to differences between plastic and paper cartons. However, the differences in the percentages of sales at the 5-cent and 3-cent premiums were not statistically significant.

⁵*Ibid.*