

# **Market Performance of Overwrapped Egg Cartons**

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Eggs have been marketed in substantially the same manner for many years. Packaging and merchandising of most other foods have been changed to improve their merchandising appeal. The following report pertains to research designed to evaluate the possibility of improving the packaging and merchandising of fresh table eggs in order that they may better keep in step with other innovations in food marketing.

## Preface

Successful overwrapping of egg cartons is highly dependent upon the availability of satisfactory machinery to accomplish the wrapping. The problem is of a more critical nature than for most foods because of the breakage of egg shells when subjected to pressure. Proper overwrapping equipment was not available when this research was initiated. Such equipment, however, is now available. There has been heightened interest in the market potential for eggs in overwrapped cartons as a result.

Continuing research regarding the marketing of table eggs is underway in the Market Development Section of the Department of Agricultural Economics and Sociology and by the food technologists in the Poultry Science Department at Texas A&M University. This report presents research results up to the time of this publication.

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## Market Analysis Objectives

A retail store market test and a study of consumer preferences for overwrapped versus unwrapped cartons of eggs was the primary objective of this research. A further objective was to analyze consumer egg buying and use patterns. This report is designed to aid the egg industry in evaluating packaging innovations and improvements before crucial business decisions are made. Retail merchandisers also can benefit from a better understanding of consumers' shopping habits, buying behavior and use patterns for table eggs as summarized in this report.

## Research Findings

1. The efficiency of film overwrap in retaining egg quality is directly related to the film's ability to retain CO<sub>2</sub> within the overwrapped carton, according to laboratory findings of the Department of Poultry Science, Texas A&M University.

Laboratory tests reveal that when eggs are stored at 55° F. and 73° F., quality (in terms of Haugh units) drops more rapidly in unwrapped cartons than in film overwrapped cartons.

If eggs are stored for periods of 4, 7 and 8 days in retail store facilities at a temperature of 39° F. ± 5°, overwrapping does not affect egg quality nearly as much.

2. In a retail store test, about 60 percent more overwrapped than unwrapped eggs were purchased in three Houston supermarkets. Sales were still increasing at the end of the 4-week test. Overwrapped and unwrapped cartons of eggs were displayed side-by-side with no price differential.

3. Purchasers of eggs rated the package appearance of overwrapped cartons significantly better than unwrapped ones. This was especially so for medium- and high-income shoppers.

Overwrapped cartons of eggs were rated significantly better than unwrapped ones for:

- Safety and convenience in transporting eggs from the store to the home.

- Quality and cleanliness ratings by respondents for overwrapped and unwrapped cartons of eggs showed no significant difference, but three out of five respondents commented favorably on the overwrapped

## Summary and Marketing Implications

product largely because of a sanitation, freshness and higher quality image.

- Ease of handling and opening for overwrapped cartons was rated as good as that for unwrapped cartons.

- Eggs in the overwrapped cartons were not significantly better than those in unwrapped cartons for internal appearance, flavor and general impressions of egg quality. However, responses to projective questions revealed a better "quality image" for the overwrapped product.

- Half of the respondents who purchased overwrapped cartons of eggs said overwrapping would be worth an extra price. Slightly more resistance was noted as incomes increased. The major reasons for saying "yes" were "less breakages," "fresher" and "cleaner." About 1 in 5 respondents who purchased only unwrapped cartons of eggs said they would pay extra for overwrapped ones. Most respondents who were not willing to pay extra said "just wouldn't pay extra" or "wrapping isn't necessary." Unfortunately, during the store test and the following interviewing period, egg prices were rising sharply. This probably created more resistance to suggestions of further price increases than would otherwise occur.

- Repeat purchases would be made by more than 8 out of 10 interviewed buyers of overwrapped cartons of eggs. Most of those not buying overwrapped cartons of eggs are receptive to positive suggestions about the overwrapped pack. Point-of-sale materials enumerating the benefits of overwrapping would stimulate this group toward the overwrapped carton.

### **Egg Shoppers' Purchasing Behavior**

"Two dozen for" pricing would have consumer appeal, since two out of three interviewed buy two or more dozen eggs at one time.

More than 7 out of 10 interviewed purchase eggs once a week. A further 2 in 10 purchase more frequently.

About 15 minutes elapsed between the time egg buyers left the store and the time they placed the eggs in their refrigerator. A further one in three said 30 minutes. For a few it was 1 to 2 hours.

### **Home Storage of Eggs**

Most households store one dozen out of a two-dozen purchase for 3 to 4 days before starting to use

them. This means a 7- to 8-day storage time from production to use under the best of timetables. It is here that overwrapping of cartons can be effective in retaining egg quality.

### **Uses of Eggs and Serving Frequency**

About 8 out of 10 egg buyers served eggs in some form at least once a day. This pattern was similar for purchasers in all income groups.

Two out of three mentioned eggs for a breakfast dish. One in four uses was for baking and general cooking. Fewer than one in 20 mentioned desserts, salads or casseroles.

Declining per capita consumption of eggs may be associated, in part, with the single-use (breakfast) image of eggs and increased competition from other breakfast foods. Demand expansion may require emphasizing other uses for eggs, such as salads, desserts and main dishes.

### **Package Design and Promotional Materials**

Consumers appeared to be striving to get away from the traditional barnyard image. Thus pictures of chickens and farm scenes do not appear in harmony with consumers' ideas.

Popular thought associations were "a plate with two eggs and bacon," "baking cakes" and other cooked forms. Pictures on cartons depicting cooked forms of the product such as eggs and bacon, salads, desserts, home baked cakes, main dishes and other egg delicacies are suggested.

A message emphasizing the high-protein, low-calorie merits of eggs plus the iron, riboflavin and vitamin A content also seems warranted.

Pictures also might be alternated for different seasons and foods appropriate to them.

### **Egg Display Cases**

Nearly 60 percent of the consumers interviewed preferred upright display cabinets with doors. Less than 1 in 3 preferred the horizontal open-top cabinet. However, the upright closed cabinet poses a display problem. Perhaps this can be overcome partially by effective use of the new air-curtain upright cases.

## Market Performance of Overwrapped Egg Cartons

ROBERT E. BRANSON AND HENRY COURTNEY\*

**R**APID EXPANSION of large producer-wholesaler firms for table eggs is occurring in the Southwest. Eggs are marketed directly to the retail food chains and are often prepackaged at the production center. As a consequence of such vertical integration, the success or failure of a firm can depend upon how well it handles its marketing functions. Thus, accurate evaluations of all aspects of egg marketing become essential to survival in the competitive race.

One important facet of market information is adequate knowledge of consumer preferences concerning egg packaging. Packaging by the table egg industry has remained nearly static for about 30 years. During this period, the industry primarily has filled the singular role of delivery boy for eggs. Food packaging for other products has meanwhile graduated to the role of consumer motivator and traveling salesman. The question arises as to whether egg packaging should move in the same direction. If so, what kind of packaging is needed, and what are the possible consequences of such innovations?

Some table egg processors and merchandisers already are moving egg packaging in the direction of being a sales agent. Various package shapes, designs, colors and overwraps are appearing. One innovation is the wrapping of egg cartons in airtight waxed paper or cello-film. A major objective of this research is to evaluate this particular kind of packaging.

### RESEARCH PLAN

Four supermarkets of a major food-store chain in Houston were selected for the research test. One supermarket was evaluated by the researchers and the food chain management as patronized primarily by low socio-economic customers. Two others selected were medium socio-economic stores, and a fourth had a high socio-economic clientele. Thus, observation of egg-sales behavior and consumer acceptance of the test packaging was possible among consumers typifying three socio-economic strata. Shoppers in the stores were almost exclusively Caucasian.

Two brands of large-size grade A and grade AA eggs were selected for the test. Arrangements were made for a constant supply of each brand and grade in unwrapped cartons and in cartons overwrapped with clear cello-wrap. Both types of packaging were to be displayed side by side in each store during a 4-week test period. No price differentials were to exist between the wrapped and unwrapped cartons.

Each store manager was asked to record egg sales during the 4-week test. Provision was made also for records of shipments to the test stores as a check upon the accuracy of the store records.

Professional consumer interviewers were assigned to each of the four stores at prearranged, randomly

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staggered hours for the test period. As shoppers purchased cartons of the eggs, in either the unwrapped or overwrapped cartons, a random sample of egg purchasers were contacted by interviewers. Each egg-purchasing shopper was given a rating form on which to record their opinions of the packaged eggs. They were requested to rate them in their homes immediately before and after opening the egg carton and again after using all or some of the eggs.

The respondents were informed that the interviewer would call for their ratings at a mutually convenient time within 4-5 days following the in-store purchase.

When the interviewers called the respondents, they also conducted a survey concerning aspects of the respondents' behavior practices in buying and using eggs.

The consumer research used both direct and indirect methods of questioning. More detailed information concerning the characteristics of the sample obtained and the research methodology are reported in the Appendix.

### PROTECTION AGAINST UNFAVORABLE TEMPERATURES

In order to evaluate properly consumer opinions concerning the overwrapping of egg cartons, it was advisable to run laboratory tests of the effect, if any, of overwrapped cartons upon egg quality and appearance. Such tests were run both before and during the retail market test.

Research before the store test revealed that certain types of egg-carton wrapping can retain CO<sub>2</sub> (carbon dioxide) within the package. Research has shown that holding a CO<sub>2</sub> atmosphere around eggs influences the retention of egg quality as measured by Haugh units.

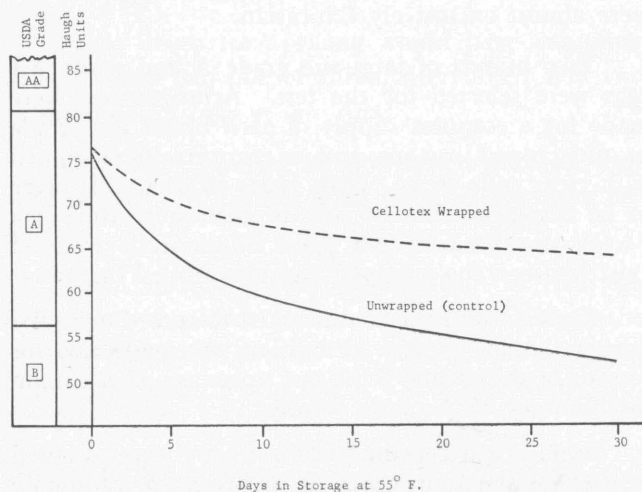


Figure 1. Influence of cellotex overwrap for egg cartons on egg quality, as measured by Haugh units, during storage.

Haugh units measure egg quality in terms of the physical height of the top of the egg albumen from the base surface upon which the egg lies. Food technologists have found a high correlation between egg freshness and albumen height. Therefore, the latter is now serving as one of the recognized methods of measuring egg quality. The relationship is shown in Figure 1. Eggs at 55° F. storage temperature and in cellotex-film, overwrapped cartons lost only 15 Haugh units (75 down to 60), whereas unwrapped carton eggs lost 27 Haugh units (falling from 75 to 48).

Temperatures at which the eggs are being held considerably influence the relative efficiency of the use of carbon dioxide retention overwraps. In Figure 2, two wraps, Cry-O-Vac and waxed paper, are compared against no wrap at 55° and 73° Fahrenheit.

For eggs held at 55° F., the advantages of a carton overwrap are not as great as at the 73° temperature. It is significant, however, that quality loss in unwrapped cartons occurs mostly within the first 3-7 days, which is the period within which most eggs are probably sold and consumed. The protection afforded against either temporary loss of optimum storage temperatures or the rise in temperature as the customer shops and takes eggs home also deserves consideration.

To test, under actual marketing condition, the effect of overwrapping egg cartons on interior egg quality, 30 one-dozen cartons of eggs were prepared. This lot was overwrapped with a cello-wrap film, and another comparable lot was not. The cartons were coded at the food chain's egg grading station to facilitate tracing them through to the point-of-sale display in the stores. In order to minimize possible quality and environmental variations, all 60 dozen eggs used in this phase of the experiment were from one egg producer and candled by the same grader. All conformed rigidly to USDA grade AA standards.

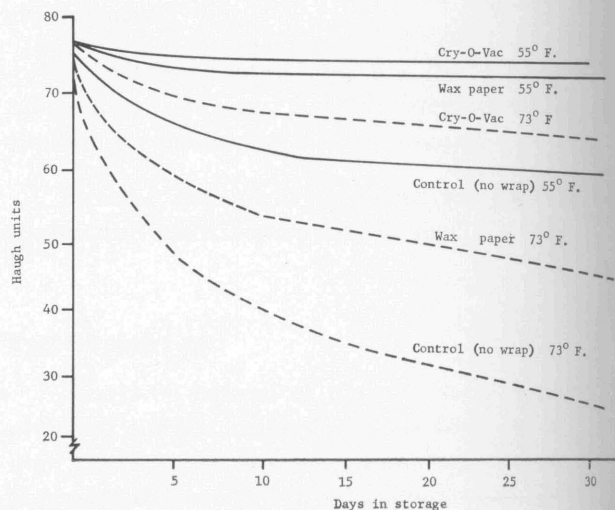


Figure 2. Effect of two wraps and two holding temperatures on egg quality.

Both the unwrapped and overwrapped cartons of eggs were delivered to the test stores under normal operating conditions using the food chain's usual transportation and handling facilities.

The internal quality of egg samples taken from the test overwrapped and unwrapped cartons were determined at the following intervals and handling points: at the processing plant immediately after the eggs were graded, upon arrival at the retail stores and after storage periods in all test stores of 4, 7 and 8 days.

Both lots of eggs were held at  $39^{\circ} \pm 5^{\circ}$  F., the usual temperature maintained in retail store storage and display facilities.

The results of this controlled experiment, conducted within the actual marketing channel, revealed that where the temperature range is maintained at  $39^{\circ}$  F.  $\pm$   $5^{\circ}$  F., overwrapping with the cello-type film had less effect on maintaining interior egg quality; however the quality curve for the unwrapped declines more rapidly than that for the wrapped eggs, Figure 3. The parallel laboratory research also showed that if temperature should not be optimum, protection against loss of egg quality (as measured by Haugh units) is significantly improved by overwrapping egg cartons.

Not explored in this test is the equally important problem of maintenance of egg quality by the consumer after the store purchase. The trip home from the store often encounters delays and unfavorable temperatures. Furthermore, the home refrigerator conditions may not be ideal. Especially when two dozen eggs are purchased at a time, the second dozen could face considerable quality loss in home refrigerators, if good temperature levels are not maintained.

#### Technical Research Implications for Egg Marketing

Although the film overwrapping of egg cartons did not appear to significantly affect in-store egg

quality under conditions of  $39^{\circ}$  F.  $\pm$   $5^{\circ}$  F., this innovation has other important retail marketing implications. There are definite merchandising advantages of overwrapped cartons as will be revealed in this report.

### OVERWRAPPED EGGS OUTSELL UNWRAPPED PRODUCT

Overwrapped egg sales totaled 10,342 dozens in the test stores for the 4-week market test. This was 60 percent above the sales of unwrapped eggs in the same stores. Wrapped and unwrapped cartons were equally displayed in the test stores for both AA and A grades and two brands. Shipment records from the egg grading plant confirmed the sales data. The two packs were displayed side by side with no price differential.

The record of sales, by weeks, is summarized in Figure 4. The margin of preference for the wrapped carton was still rising at the close of the market test.

Which income group bought the overwrapped eggs? Analysis revealed that about 2 out of 3 in the low- and high-income households purchased the overwrapped eggs, Figure 5. More than half the medium-income families bought the overwrapped eggs.

### OVERWRAPPED CARTONS RATED FAVORABLY

The professional interviewer succeeded in interviewing 86 percent of the 439 egg buyers initially contacted in the four test stores. Of these, 137 respondents had purchased unwrapped cartons of eggs, and 340 purchased overwrapped cartons.

The first section of the rating form requested buyers to rate the egg carton immediately before and just after the initial opening of the egg package in

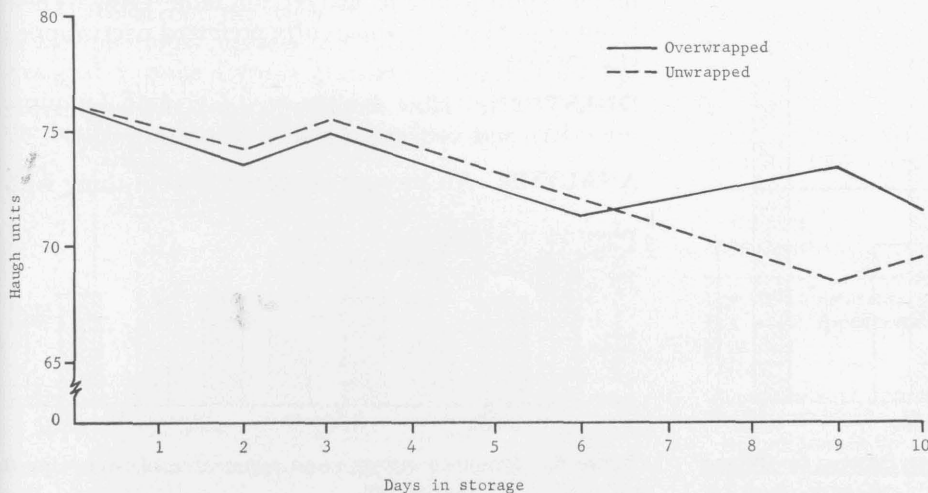


Figure 3. Effect of cellophane overwrapping on the interior quality of eggs held at  $39^{\circ}$  F. in retail store display case.

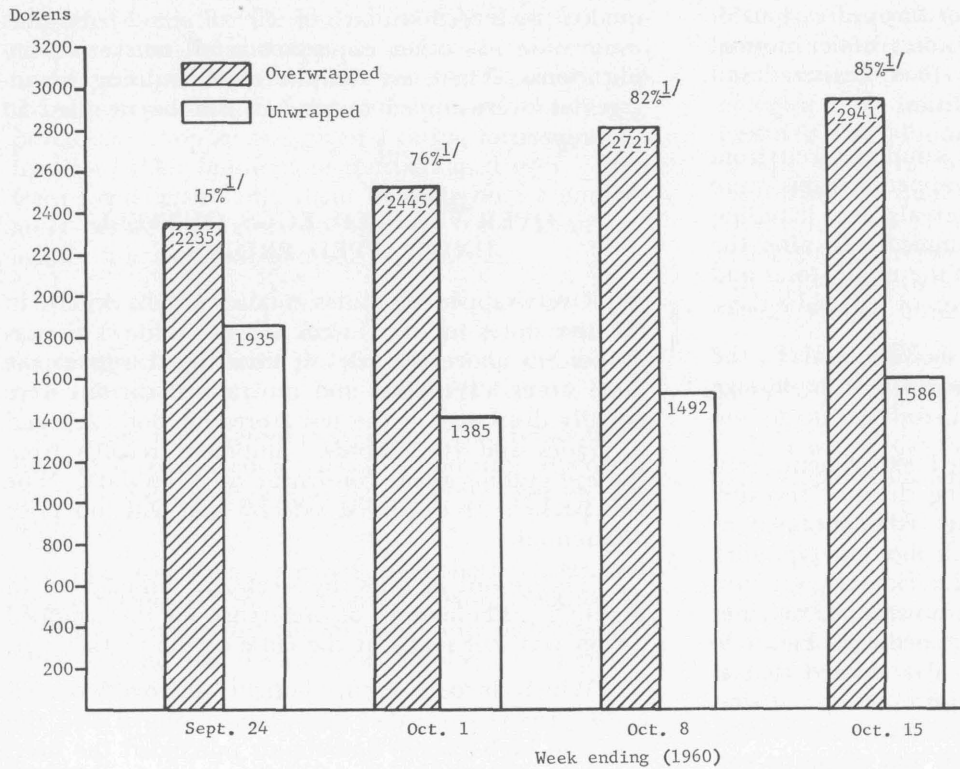


Figure 4. Sales of overwrapped and unwrapped cartons of eggs in three Houston supermarkets from which records were available during a 4-week test. Records from the fourth supermarket did not measure up to required research standards and thus were excluded.

<sup>1/</sup>Percentage lead of wrapped over unwrapped

their homes. Ratings were requested for the following characteristics: package appearance; safety and convenience in transporting the eggs from the store to their home; consumers' confidence regarding the expected quality and cleanliness of the product in the package before opening it; and ease of handling and opening the package.

Ratings by the various factors were based on a 9-point hedonic scale. Numbers 1 and 2 were "best," 3 and 4 were "above average," 5 was "average," 6 and 7 were "below average," and 8 and 9 were "worst."

**QUESTION:** How would you rank this package for eggs as to appearance?

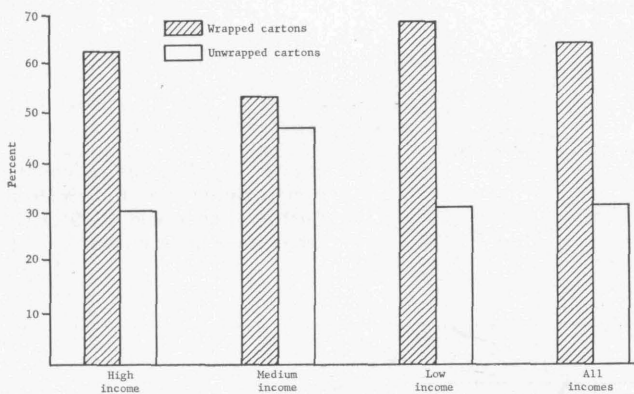


Figure 5. Proportion buying wrapped egg cartons, by income class, Houston, 1960.

**ANALYSIS:** The high- and middle-income groups ranked the overwrapped egg carton as "best" in appearance on the 9-point hedonic scale, Figure 6. The same egg carton unwrapped was generally considered to be just "above average" in appearance. The low income group considered both packages equally good. For all income groups combined, the wrapped carton was rated "best" and the unwrapped simply "above average." Ratings of the wrapped carton by the high, medium and all income groups were all significantly higher by statistical tests.

### Market Implications

Medium- and high-income families represent the major segment of the market for table eggs. These families in Houston apparently preferred overwrapped egg cartons.

**QUESTION:** How would you rank this egg carton for safety and convenience in transporting eggs?

**ANALYSIS:** All income categories, except those with

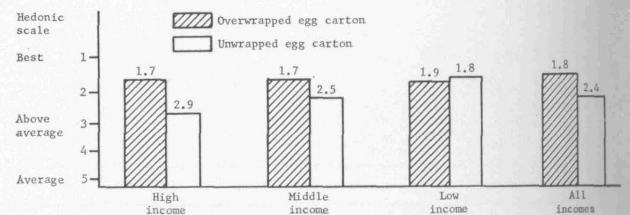


Figure 6. Consumer ratings as to appearance of overwrapped egg cartons, by income class.



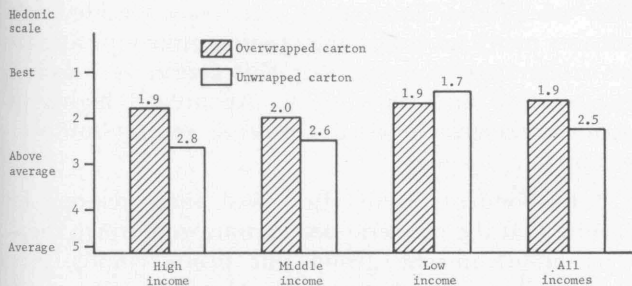


Figure 7. Consumer ratings as to safety and convenience in transporting egg cartons, by income class.

low incomes, ranked the overwrapped egg carton as "best," Figure 7. The same carton unwrapped was ranked only as "above average." In each of these instances, the higher ratings of the overwrapped cartons are significant by statistical tests.

### Market Implications

A latent fear persists of breaking eggs sacked along with other food items. Consumers felt that overwrapping gave the carton greater strength and thereby the eggs more protection. Furthermore, should there be accidental breakage, the egg contents could not escape the package and damage other foods. Since most consumers shop for food once a week, package safety is an important consideration.

**QUESTION:** What rating would you give these eggs for quality and cleanliness?

**ANALYSIS:** There was no significant difference in quality and cleanliness ratings by any income group, for the wrapped versus unwrapped eggs, Figure 8. However, when projective questions were used, consumers' spontaneous comments were that overwrapped eggs were "cleaner, more sanitary, fresher and better." Therefore, this is a case in which hedonic scales apparently failed to elicit as much of the inherent consumer feelings toward overwrapped cartons as was possible by projective techniques.

### Market Implications

If we accept the view that the projective technique questions' answers are more valid, then overwrapped cartons have a purchase appeal from the sanitation and quality viewpoint. On the other hand, the hedonic scale test clearly demonstrates that over-

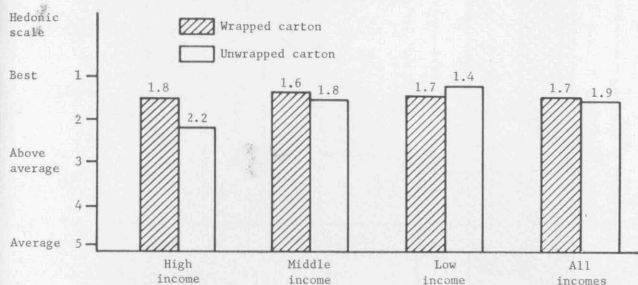


Figure 8. Consumer ratings as to quality and cleanliness of eggs, by income class.

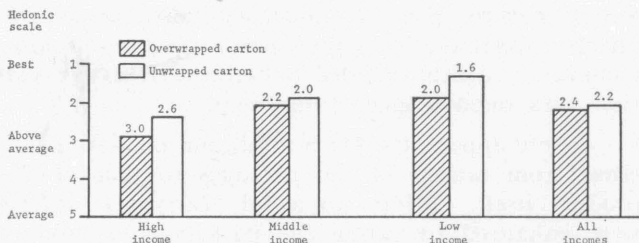


Figure 9. Consumer ratings as to ease of handling and opening egg cartons, by income class.

wrapped cartons are not viewed skeptically from the cleanliness and quality associations standpoint.

**QUESTION:** How would you rate the ease of handling and opening of this egg carton?

**ANALYSIS:** Although the unwrapped carton is rated slightly easier to handle and open than wrapped cartons, the differences shown are not found statistically significant for any of the income groups, Figure 9. The tendency to recognize a little extra effort in opening the package reflects well on the care given by consumers in making the product ratings.

### Market Implications

There was little, if any, objection to opening a wrapper on the egg carton. So many foods are wrapped in containers to preserve freshness that the consumer apparently takes it as a matter of course, when there appears to be a reason for it.

## CONSUMER EVALUATION OF EGGS

A second section of the rating form given purchasers in the test stores concerned the homemaker's evaluation of the eggs after having used most, if not all, of them. Ratings were requested as to the following factors: appearance of the egg yolk, appearance of the egg white, freshness, flavor and general overall impressions of the egg quality.

A statistical analysis revealed no significant difference, at the 95 percent confidence level, between ratings given eggs in the wrapped versus unwrapped cartons. Nonetheless, there was a constant tendency to rate more favorably those in the wrapped cartons. This suggests that the differences were not of a random

TABLE 1. EGG QUALITY, RATINGS FOR WRAPPED AND UNWRAPPED CARTON EGGS, HOUSTON, 1960

Product characteristic	Average rating <sup>1</sup>	
	Wrapped	Unwrapped
Egg yolk appearance	2.3	2.6
Egg white appearance	2.3	2.7
Freshness	2.3	2.5
Flavor	2.3	2.5
General quality impression	2.3	2.5
Number of sample households	246	136

<sup>1</sup>Hedonic scale with "1" as superior and "9" as extremely poor.

sample nature, Table 1. Such an indication is supported further by the responses to projective question techniques, which revealed a higher quality association with overwrapped carton eggs.

There apparently was a minimum of "carryover" effect from ratings of the packages to that of the product itself. Efforts to avoid "carryover" effects were enhanced by rating the package and product at different times; furthermore, the package and the egg quality ratings were recorded on separate pages of the consumer schedule.

### WILLINGNESS TO PAY FOR OVERWRAPPING

A critical question for marketers is, "If we overwrap eggs, are consumers prepared to pay extra for the new packaging?" In the market test, overwrapped and unwrapped cartons of eggs were sold at the same price.

A few days after the start of the market test, egg prices increased and continued to increase sharply throughout the test and part of the interviewing period. This would be expected to create definite consumer resistance to suggestions of any further price increases.

Nonetheless, more respondents who purchased overwrapped cartons of eggs said they were worth a few cents more than those who bought unwrapped ones. However, among purchasers of overwrapped cartons, only about half of all the respondents said they would pay extra, Figure 10. About 4 in 10 said

they would not, and one in ten was undecided. As income increased so did the opinion among purchasers of overwrapped cartons that this carton of eggs was not worth 1 or 2 cents more. Apparently higher income housewives wanted the store to pay for overwrapping.

Respondents were also asked their reasons for feeling that the overwrapped cartons were worth more. The middle-income group put prime emphasis on less egg breakage, Figure 11. However, all income groups considered less breakage an important consideration. High- and low-income groups put most weight on freshness. As income levels increased, there was also a gain in emphasis on "cleaner" as a reason for paying more for overwrapped cartons.

Purchasers of overwrapped cartons of eggs who said "No" to overwrapping being worth a cent or two more gave negative reasons, Figure 12.

Among the "No" responders a relatively high percentage indicated that broken or cracked eggs were found in the overwrapped cartons. This was primarily due to the fact that the overwrapping equipment, installed on a temporary basis, was not working satisfactorily. This problem was discovered during the interviewing period.

### REPEAT PURCHASES

More than 8 out of 10 respondents who purchased overwrapped eggs said they would purchase overwrapped eggs again. About 1 in 20 was undecided; and only 10 percent said "No." The majority of the

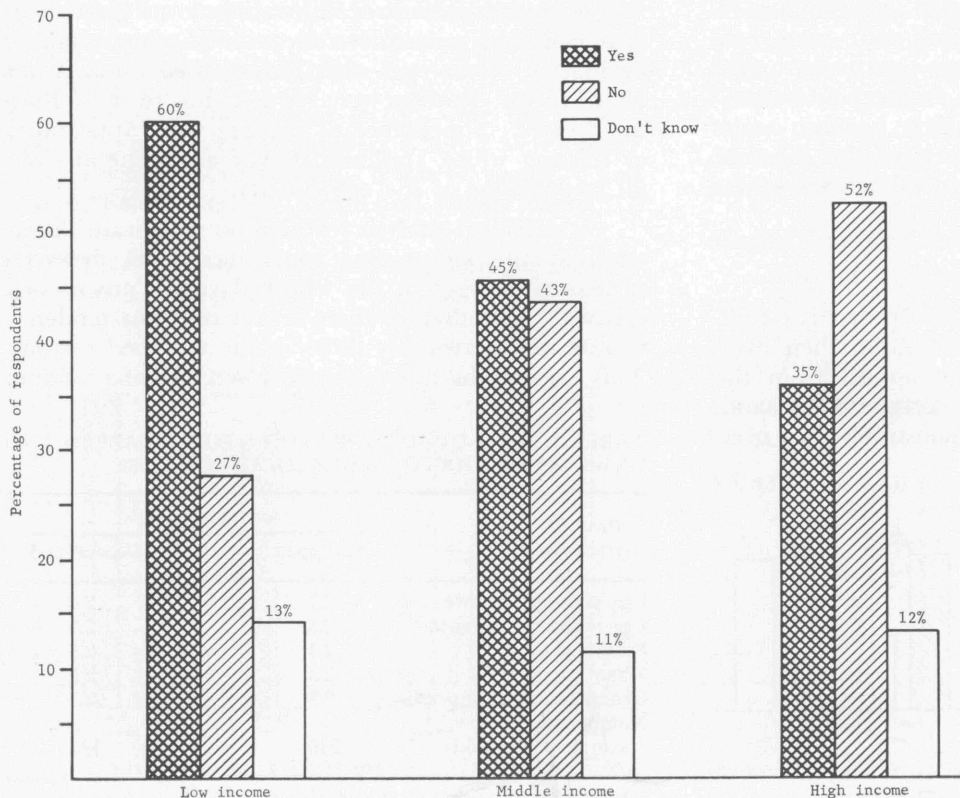


Figure 10. Respondents' answers to the question: "Would most housewives feel that cartons of eggs overwrapped with film are worth a cent or two more than unwrapped ones?"

respondents who said they would purchase overwrapped cartons of eggs again gave as their reasons: "good eggs—satisfied," "fresher," "cleaner" and "less breakage."

More than 9 out of 10 of all respondents

who purchased the unwrapped cartons of eggs said they would purchase unwrapped ones again. Among reasons to repurchase, those who bought unwrapped cartons said "habit" about five times more often than the overwrapped carton group.

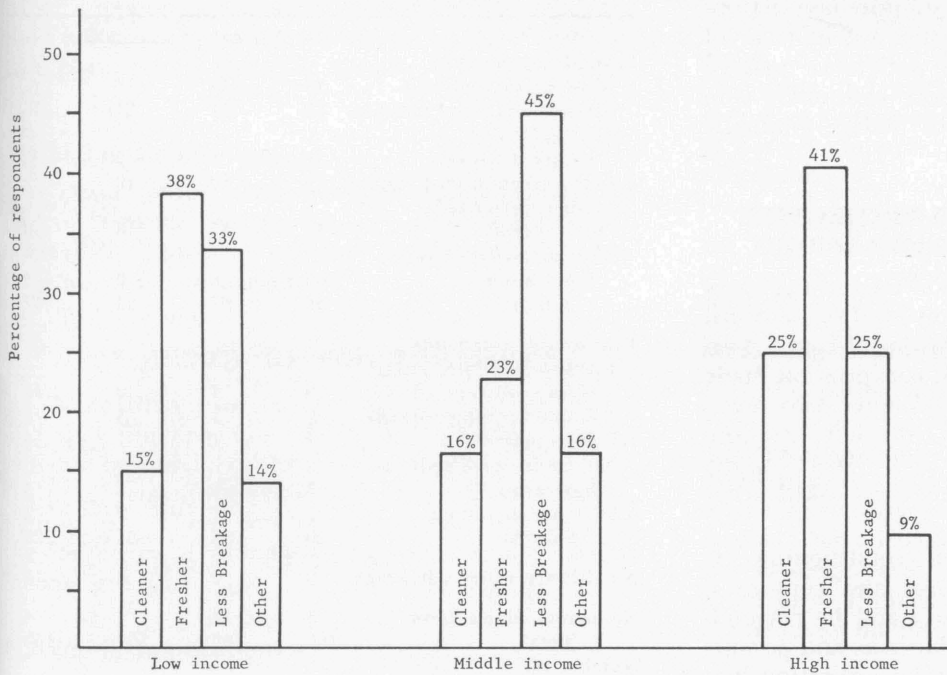
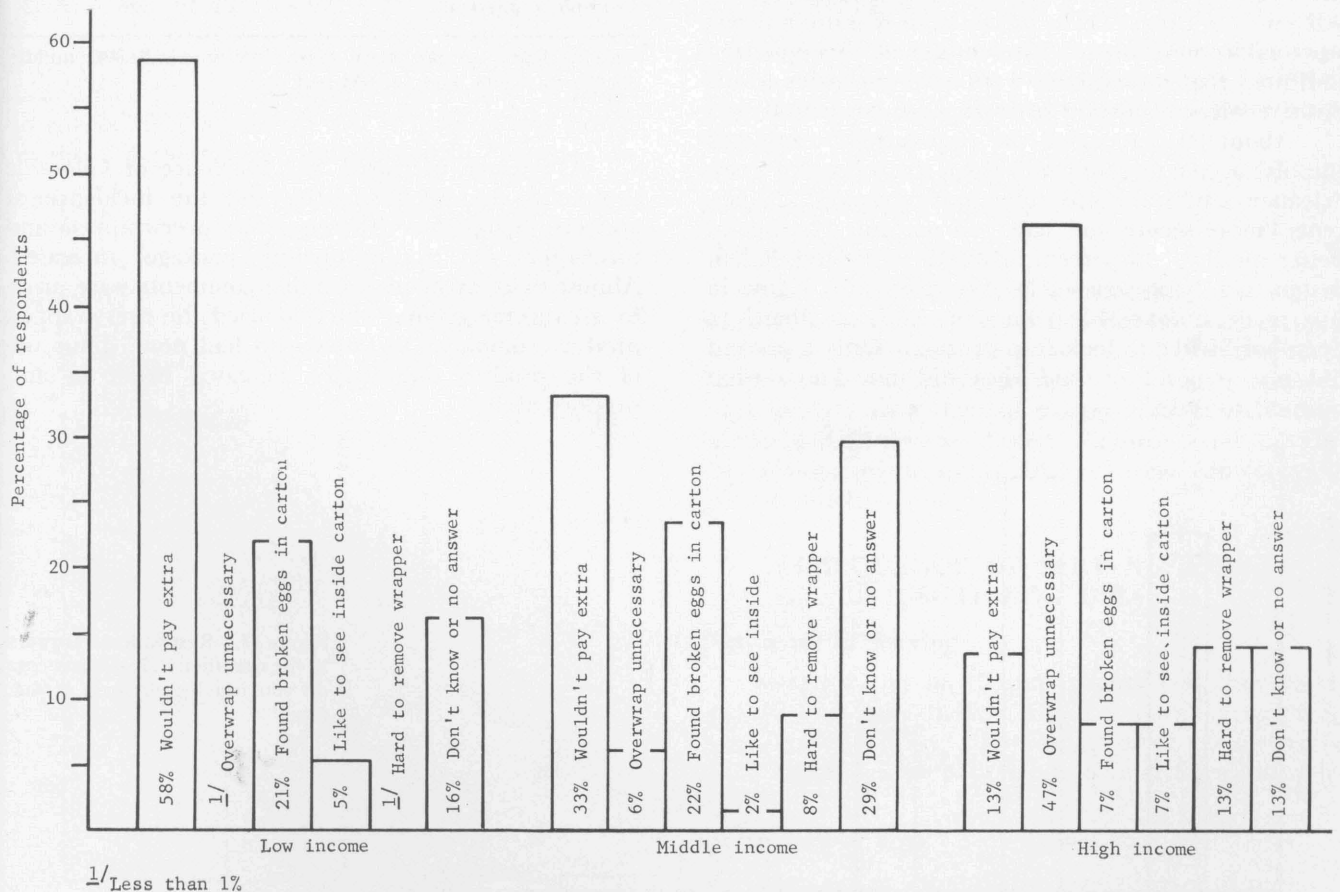


Figure 11. Reasons given by purchasers of overwrapped cartons of eggs for willingness to pay for overwrapping.



1/2 Less than 1%

Respondents who purchased overwrapped cartons of eggs.

Figure 12. Reasons given by purchasers of overwrapped cartons of eggs for unwillingness to pay for overwrapping.

## Marketing Implications

Purchasers of overwrapped and those of unwrapped eggs were apparently about equally satisfied with their purchase. However, since about 60 percent more overwrapped than unwrapped cartons of eggs were actually sold during the test, purchase actions are that over-all consumer preference was in favor of the overwrapped product. This preference pattern could strengthen over time as more consumers who buy the unwrapped product out of "habit" gradually decided to change.

### RESPONSES TO INDIRECT PROJECTIVE QUESTIONS ABOUT OVERWRAPPING

The indirect projective question used in the study was a tape recorded simulated conversation between five women about overwrapped cartons of eggs. Two of the speakers in the hypothetical conversation made favorable comments about the packaging, two made unfavorable comments, and the fifth left her conclusions unfinished. The latter said, "Well, in my opinion . . ." and the respondent was asked what opinion she thought the speaker held.

The projective technique of conditioning respondents with respect to the pros and cons of a situation tends to evoke a definite stand by respondents either for or against a particular issue and permits her to take this stand comfortably by projecting herself into the third person rather than making a direct personal commitment. The results of this question indicated that respondents were quite receptive to the positive ideas regarding overwrapped cartons of eggs.

About 60 percent of the respondents completed the fifth speaker's comments along the following lines: "cleaner, sanitary, keeps others out of carton," 29 percent; "more secure and safe," 16 percent; "fresher or better quality," 13 percent, Table 2. One respondent in ten said "wrapping makes no difference." One in five made unfavorable comments such as "hard to open" or "I like to look into carton." Only 8 percent did not respond or said they did not know what opinion to state.

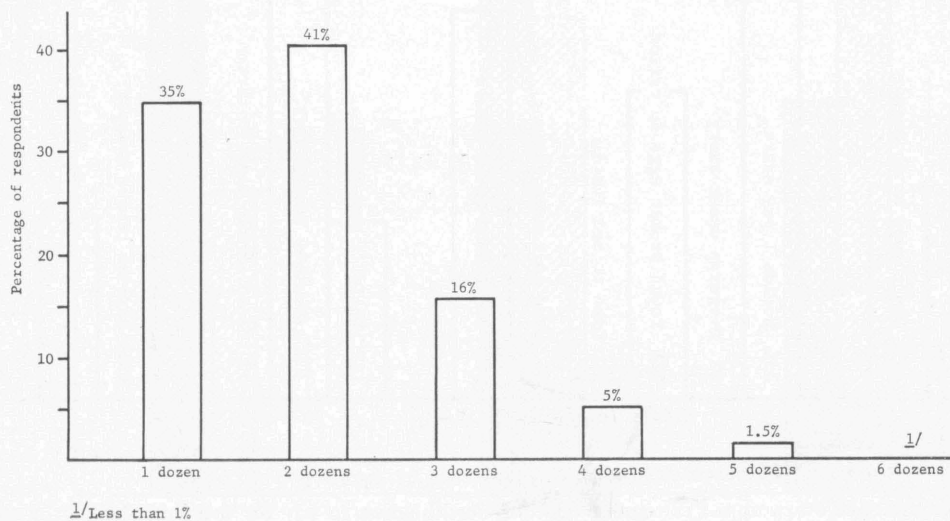


TABLE 2. GENERAL OPINIONS REGARDING EGG CARTONS WRAPPED WITH CELLO-FILM AS EXPRESSED IN PROJECTIVE INTERVIEWS

Opinions	Total	Family income <sup>1</sup>		
		Low	Middle	High
— Percent of respondents —				
Favorable comments				
More secure and safe	16	14	19	13
Cleaner and more sanitary	20	17	21	18
Likes sealed or wrapped cartons	2	1	2	2
Keeps others from handling	9	10	10	7
Fresher, better taste and quality	13	19	10	13
More attractive—like fancy grade	3	6	2	4
Subtotal	63	67	64	57
Unfavorable comments				
Likes to look into carton before purchase of eggs	9	4	10	11
Trouble opening package	5	3	5	8
Unnecessary	1	4		1
Not fresh—smell spoiled—bad taste	3	1	4	4
Will not pay more	2	1	2	2
Subtotal	20	13	21	26
No difference—no advantage	9	6	8	13
No answer—don't know	8	14	7	4
Total	100	100	100	100
Number of sample households	382	92	198	92

<sup>1</sup>Income levels for the study were: low, under \$4,000; middle, \$4,000 to \$7,999; high, \$8,000 and over.

As income increased, the incidence of favorable comments decreased slightly, and the incidence of answers saying "no difference" in overwrapped and unwrapped or "trouble opening package" increased. Almost twice as many favorable comments were made by all income groups who had tried the overwrapped product compared to those who had not. Thus use of the product apparently increased belief in and support of it.

Figure 13. Respondents' answers to the question: "How many eggs do you usually purchase at one time?"

## EGG SHOPPERS' PURCHASING BEHAVIOR

### Quantity Purchased at One Time

The distributions of respondents buying various quantities of eggs per purchase are shown in Figure 13. More respondents purchased 2 dozen eggs at one time than any other quantity. Two out of three respondents purchased a multiple number of dozens at one time.

### Marketing Implications

These findings indicate that multiple packs of eggs or "two for" pricing may be worth consideration. Specials on eggs at a "two for" price may be particularly attractive to consumers.

## FREQUENCY OF EGG PURCHASES

More than two out of three of the egg buyers said they purchase eggs about once weekly. One in five said he purchases them two or three times weekly. Only 12 percent purchase eggs every 2 or 3 weeks, Figure 14. There was no significant difference in the frequency of purchasing eggs among the various income groups.

### Marketing Implications

Nine out of 10 consumers purchase eggs weekly or more frequently. If the food store gets fresh deliveries two or more times per week, the likelihood of consumers finding low quality eggs is small. Furthermore, a product purchased that frequently and stored for short periods is a desirable price "special" in

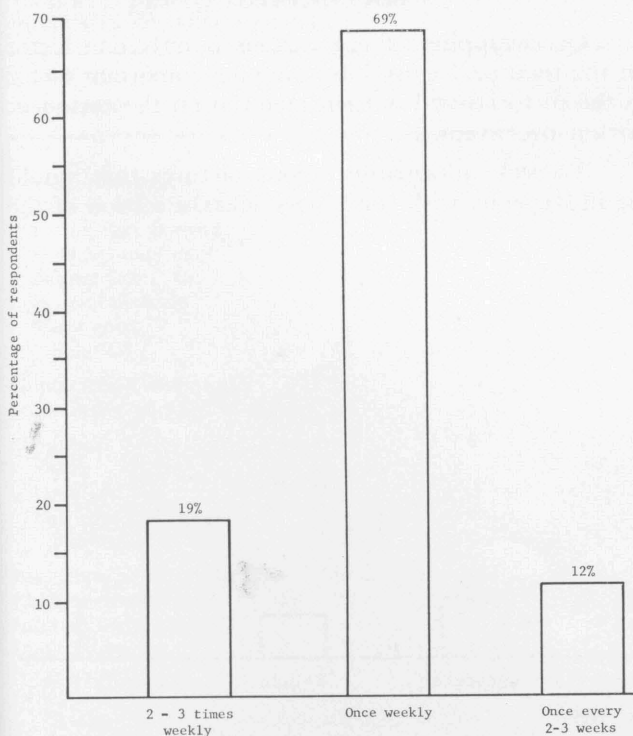


Figure 14. Respondents' frequency of purchasing eggs.

that it does not tend to suppress sales in the succeeding period.

## TIME LAPSE BETWEEN PURCHASE AND HOME REFRIGERATION

Nearly half of the respondents reported that about 15 minutes elapse between their leaving the food store and placing the eggs in their refrigerator. A further one in three said 30 minutes. The others, 17 percent, reported varying periods from 45 minutes to 2 hours.

Assuming that women may tend to underestimate the time by as much as 100 percent, then 8 out of 10 consumers possibly keep eggs in their autos between 30 to 60 minutes.

### Marketing Implications

The period elapsing between leaving the store and placing egg purchases in the home refrigerator, reported by 8 out of 10 respondents as 15 minutes to 30 minutes, may impair egg quality if there are high temperatures in the car. On a 90°-day it is not unusual for a parked car to register 110° to 130° in the passenger area. This may mean that the eggs could drop appreciably in quality. Further research is underway on this aspect.

## LENGTH OF HOME EGG STORAGE

About one-fourth of the respondents store eggs 3 days or less. Another fourth keeps eggs 4-6 days. The remaining half of the consumers usually keep eggs 7 or more days.

The storage pattern according to family income is summarized in Figure 15.

### Marketing Implications

Most eggs are 4 days old at the time of purchase in retail stores. Since many families buy two cartons at a time, this means that the second carton spends another 3 to 4 days in storage before being opened. This totals 7 to 8 days of storage—the period when quality can deteriorate fastest, Figures 1 and 2. For this reason overwrapping egg cartons can provide product quality benefits.

## FREQUENCY OF SERVING AND USUAL EGG USES

### Frequency of Serving

Nearly 8 out of 10 respondents said they serve eggs at least once daily. About 1 in 8 serves them 1 to 3 times weekly. The others serve them 4 to 6 times weekly. This pattern was similar for all income groups.

### Usual Uses of Eggs

Two out of three of the uses of eggs mentioned were in the "breakfast category"—fried, scrambled, poached and boiled. About one suggestion in four

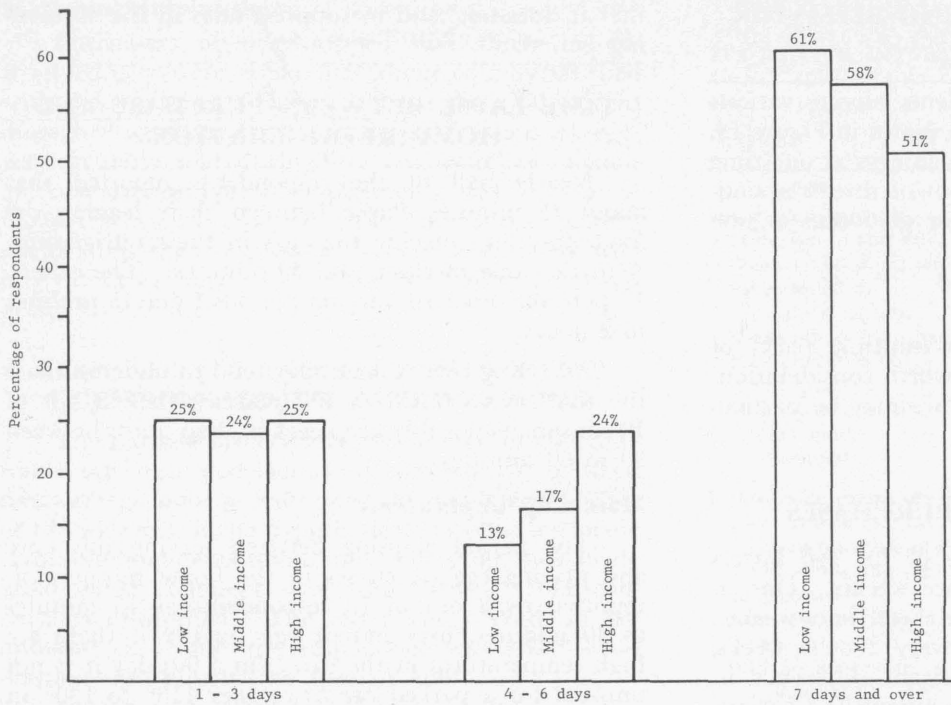


Figure 15. Respondents' answers to the question: "How long do you usually store eggs in your home refrigerator?"

was for baking and general cooking. Fewer than 1 in 20 mentioned for desserts, salads and casseroles, Figure 16.

The use pattern was comparable for all three income groups.

### Marketing Implications

Traditionally, eggs are considered a breakfast food and single-use product. This image limits demand expansion for the product. It is possible that egg cartons and display material should emphasize other numerous egg uses and stress the product's versatility. Recommended are promotional materials based on the theme, "Eggs Are a Convenience Food With 1001 Uses," that is, eggs in salads and salad dressings, in sauces and soups, in desserts, for garnishing dishes, for frozen desserts and candies, and eggs

in main dishes with cheese, fish, meats, vegetables, fruits and cereals. For two reasons this should be given serious thought: the demand for a multi-use product probably can be expanded more readily than for a single-use product, and breakfast cereals are competing strongly with eggs for breakfast, the major single use of eggs.

### PACKAGING AND PROMOTIONAL MATERIALS

Overwrapping of egg cartons is only one factor in the total packaging job. Another important factor is the pictorial and written material on the carton or carton overwraps.

To seek information about pictures that would be in harmony with consumers' ideas, a section of the

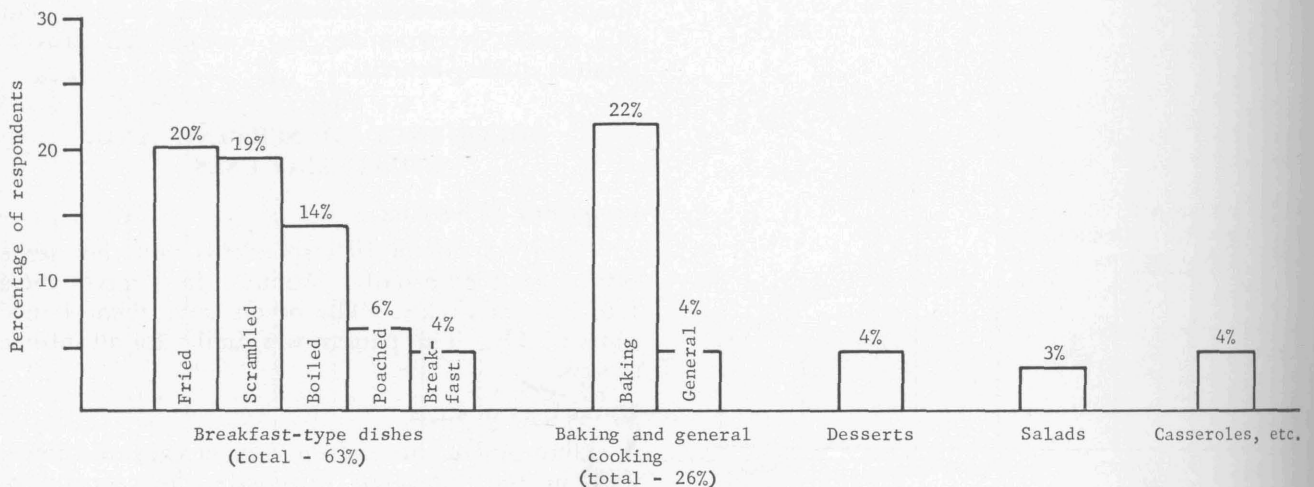


Figure 16. Respondents' usual uses for eggs.

research was devoted to a picture/thought association test for table eggs. An indirect projective question, built around a tape recorded conversation among four housewives, was used to determine consumer picture/thought associations when they "pictured" excellent table eggs.

Test results revealed that 44 percent of the respondents thought of some "cooked-egg" aspect. Predominant thoughts were of "a typical American breakfast" and "baking cakes and other delicacies with eggs," Table 3.

About one in seven thought of eggs in the shell; however, these eggs were mentioned as "big," "white," "fresh" and "clean."

Only one respondent in five actually thought of eggs in terms of "chickens," "farms" and "barnyards." Among this group common qualifications were: "a big, clean farm" or "the barn was a good one."

As income levels increased the association of the cooked-egg idea also increased.

### Marketing Implications

For many years egg cartons often have carried pictures depicting chickens, barnyards or other farm scenes. The foregoing research results indicate a need to get away from the traditional barnyard image of eggs. Suggested are pictures of a typical American breakfast plate, baked cakes, salads, desserts and other egg delicacies.

In addition, since only 3 percent of the respondents were sharply conscious of the nutritional value of eggs, the carton could carry information regarding the high-protein low-calorie nature of eggs plus the

TABLE 3. RESPONDENTS' ASSOCIATIONS OF EGGS WITH PICTURES OR SITUATIONS

Associations	Family income		
	Low	Middle	High
	-- Percent of respondents --		
Cooked food aspect			
Typical breakfast	25	32	34
Fixing eggs at stove		2	
Food value of eggs	6	3	6
Baking cakes, etc.	3	4	2
General cooking	3		10
Taste good			2
Subtotal	37	41	54
Nonfood and nonfarm			
Attractive package or display	3	1	2
Shopping	4	2	
Easter	1		1
High cost		2	
Bad eggs I've bought	1	1	
Subtotal	9	6	3
Big, fresh, white, clean eggs	15	20	10
Chicken, farm, barn	22	22	22
Internal appearance	6		3
Don't know	5	7	
No response	6	5	8
Other		1	
Total	100	100	100
Number of sample households	92	198	92

TABLE 4. RESPONDENTS' PREFERENCE FOR UPRIGHT OR HORIZONTAL DISPLAY CABINETS

Type of egg display cabinet preferred	Family income		
	Low	Middle	High
	-- Percent of respondents --		
Upright	61	57	53
Horizontal	24	36	37
Other	6	4	8
No answer	9	3	2
Total	100	100	100
Number of sample households	92	198	92

iron, riboflavin and vitamin A content.

Another possible sales incentive may be to use different pictures on the egg cartons at different seasons of the year—appropriate to the season. For example: salads and salad dressings in summer; sandwiches, soups and main dishes in winter; hard-cooked and deviled eggs for summer and early fall cook-outs and picnics; and baking, candies and frozen desserts for festive occasions. This same idea applies to advertising and point-of-sale display materials. Eggs should be emphasized as versatile and exciting rather than only as a breakfast food.

### DISPLAY CABINETS

Respondents were interviewed using an indirect projective question, similar to the other projectives outlined, to determine whether they preferred a horizontal open-top egg display cabinet or upright ones with doors.

Results indicated that a majority prefer upright egg display cabinets with glass doors, Table 4.

As income levels increased, the preference for horizontal cabinets also gained somewhat. However, the majority still preferred the upright, Table 4.

Reasons given for preferring the upright were primarily "convenient—do not have to reach down" and "like my refrigerator—colder and more protection." Reasons were similar for all income groups, Table 5.

Those preferring the horizontal open-top display case said they prefer it because "convenient—easy to pick up cartons;" "keeps the eggs better and fresher;" "no doors, saves time;" and "milk in upright cabinets wets cartons."

### Marketing Implications

In upright egg display cabinets the egg cartons are generally stacked with their end view to the front. This has disadvantages with respect to shoppers being able to see price markings readily, and it also obscures "eye appeal" design of the top panel on the carton. On the other hand, with a premium on shelf space, more eggs can be stored within a smaller number of shelf-space feet than is possible with a horizontal open-top display. The decision here depends on the degree to which the marketer is interested in sales of eggs versus other products. Most products generally get

TABLE 5. RESPONDENTS' REASONS FOR PREFERRING INDICATED TYPE OF EGG DISPLAY CABINETS

Type of cabinet and reasons	Family income		
	Low	Middle	High
— Percent of respondents —			
Horizontal cabinet			
Keeps better, colder, fresher and more protection	15	7	4
Easy to pick up, more convenient	49	32	48
No doors, saves time and consumer congestion	28	47	29
Can see cartons and prices better	5	9	9
Wets cartons	3	1	4
No difference		1	2
No answer			4
Other		3	
Total	100	100	100
Upright cabinet			
Keeps better, colder, fresher and more protection	43	43	41
Doors on cabinet like my refrigerator doors		3	2
Convenient, do not have to reach down	28	26	27
Can see cartons and price better	19	21	18
No wet cartons			2
Habit	4		
Neater	2		2
No difference		4	
No answer	4	1	7
Other		2	1
Total	100	100	100
Number of sample households	92	198	92

the consumer's eye for about one-fifth of a second. If only a dull end view of the carton is visible to consumers, the enclosed upright is probably a less effective "salesman" than the horizontal. This problem, however, is probably solved by the new upright air-curtain type of cabinet.

## Appendix

The retail store tests were conducted over a 4-week period in four selected Houston supermarkets of a single food chain September 17-October 15, 1960.

One of the four stores was patronized primarily by low-income consumers, two by medium-income consumers and one by high-income consumers.

Throughout the study, income groups are designated as follows: low—under \$4,000 per year; medium, \$4,000 to \$7,999; and high, \$8,000 and over.

The income levels of the survey respondents were similar to those of the total Houston population, Appendix Table 1. A close agreement would not be expected from research among customers of only four food chain stores.

Professional consumer interviewers were placed in each store at preselected, randomly staggered hours during the 4-week test. As shoppers purchased eggs,

APPENDIX TABLE 1. INCOME LEVELS OF HOUSTON FAMILIES COMPARED TO THOSE OF THE SURVEY SAMPLE, 1960

	Sample	Houston <sup>1</sup>
Less than \$4,000	24%	35%
\$4,000 to \$7,999	52%	45%
\$8,000 and over	24%	20%

<sup>1</sup>Survey of Buying Power, *Sales Management*, May 1961.

a random sample of 439 shoppers were contacted. Each of these shoppers was given a form to use at home for the purpose of rating her purchase for several characteristics. A nine-point hedonic rating scale was used.

The respondents were later contacted at their homes to obtain the product ratings, and, at the same time, they were interviewed regarding other areas pertinent to the study. All interviews were conducted by telephone.<sup>1</sup>

Interviews were completed with 382 of the 439 shoppers initially contacted in the food stores. Two hundred and forty-six of the interviewees were purchasers of overwrapped cartons of eggs, and 136 purchased the unwrapped ones.

Direct and indirect projective questioning was employed in the attitude survey. Tape recorded audio-projectives were developed for the study. Approximately half of the respondents were interviewed using a tape recorded schedule of questions. The other half were interviewed "live voice." In both cases, professional interviewers wrote down the respondents' answers.

Egg sales records were kept by the store managers in the test stores for both overwrapped and unwrapped cartons of eggs. The records were verified with shipments from the egg processing and grading plant.

Differences in averages of ratings for overwrapped versus unwrapped cartons of eggs, for the various characteristics researched, were subjected to statistical tests for differences between means. Distributions of respondents' ratings for the two types of packages were subjected to Chi-square analyses. Significance in these tests were measured at the 0.95 probability level.

The research methods study associated with this problem-solving research project involved experimental use of a tape recorded schedule of questions versus "live voice" interviewing. Copies of questionnaires, instructions to interviewers and other survey materials used are available to other researchers. Results of the research methods study pertaining to audio-projectives are also available from the Market Development Section of the Department of Agricultural Economics and Sociology, Texas A&M University, College Station, Texas.

<sup>1</sup>For an appraisal of telephone versus personal interviewing see "Response Variations Between Telephone and Personal Interviews in Consumer Market Survey," a research methodology report of the Market Development Section, Dept. of Ag. Eco. & Soc., Texas A&M University.