Educational Posters And Their Effect on Teenagers' Attitudes Toward Milk

By

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PREFACE

This is one of several reports contributing to the Southern Regional Food Marketing Project SM-13 (2R), "Consumer Responses to Food Promotions and Education Programs." The study explores the impact of selected educational posters on students' attitudes toward milk drinking, on their knowledge of the nutritive value of milk and on their consumption of milk and dairy products. The analysis combines the data from the ninth and tenth grade students in four Kentucky high schools.

The author is grateful to the students, teachers and principals of the high schools who cooperated. Acknowledgment is also extended to Mrs. Mildred R. Wightman, Home Economics Extension Specialists, Rowan county, and formerly Assistant Professor of Home Economics; and to Harold C. Young, formerly Assistant in Agricultural Economics, University of Kentucky. They were largely responsible for the conduct and early phases of the research, and for the data collection and preparation.

The findings will be of interest to parents, teachers, public officials and others concerned with communication techniques for improving nutrition and balanced diets and will be of special interest to the dairy industry and its concern with the teenage markets.

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EDUCATIONAL POSTERS AND THEIR EFFECT ON TEENAGERS' ATTITUDES TOWARD MILK

by

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Good nutrition and balanced diets are especially important to teenagers because of their accelerated growth and high energy requirements. Teachers, parents, public health officials and others who work with this age group are especially aware of the nutritional problems that many teenagers themselves seem to ignore and neglect. Studies have shown that many teenagers, especially girls, do not consume the foods needed for optimum growth and development. For many, the diets are low in calcium and riboflavin, a nutrient deficiency that could be eliminated by using the recommended amounts of milk. Accordingly, this study was undertaken to determine effective methods of encouraging youths to choose milk and other dairy products for between-meal snacks and to drink milk with meals. A selected group of educational posters, primarily focused on good nutrition, was chosen for this purpose.[2]

In a previous study, it was found that a short run exposure of ninth and tenth grade students to educational posters in their school and homeroom environment had: (1) directly influenced the beverage choices of the students; (2) made exposed students more knowledgeable about food values and nutritional needs; and (3) created an awareness of the part played by milk and dairy products in health and well-being. The posters had also been a small but positive force in creating favorable attitudes toward dairy products and in increasing consumption [1].[3] As a result of these findings from an experiment done under controlled conditions, the question was raised as to whether similar results could be expected from posters used under less restrictive conditions. Accordingly, a "follow-up-experiment" was initiated. Arrangements were made to display educational posters intermittently in the hallways and corridors of four high schools during an entire school year and to test the ninth and tenth grade students at the end of the year.

PURPOSE

The primary purpose of this study was to explore further the educational value of the poster technique. It was hypothesized

[1]Professor of Agricultural Economics, Department of Agricultural Economics.

[2]Special appreciation is expressed to the National Dairy Council for supplying the posters. Most of the research was done as a contribution to the Southern Regional Food Marketing Research Project SM-13.

[3]Numerals within brackets refer to publications in "Literature Cited."

that a series of educational posters displayed outside the classrooms would have a measurable impact, i.e., that the students would remember the displays, know what they were about and respond in various ways to the information and messages contained. It was also believed that there would be differences in the attitude, knowledge and use pattern between the exposed and unexposed students from the same universe. In testing this hypothesis, a questionnaire identical to that used in the previous controlled experiment was used.

Besides the information secured from the questionnaires, a panel of teenagers was set up to evaluate further the posters. This panel was made up of students enrolled in marketing, business, and/or distributive education classes. The purpose of the panel was to provide the investigators with information about how high school students might feel about the posters selected and displayed. Each panel member was asked to rate posters according to his opinion about: (1) the degree to which each would interest other high school students, his peers; (2) the percentage of students who would notice each set of posters used; (3) the extent to which the headings and contents would be read; and (4) how he would personally rate the displays for clarity and appropriateness for the purposes as defined by the investigators. It was hypothesized that these opinions of teenagers themselves would provide help in understanding of the teenagers point of view and thus further the objectives of the research.

SCOPE AND METHOD

Four Kentucky high schools with an enrollment of approximately 2,500 students took part. The design of the experiment was simple; i.e., the posters chosen were put up where they could be seen, there were no announcements, no special headings, and no effort on the part of the experimenters to relate the posters to teaching or to call attention to their contents. The teachers in the schools were asked to tell curious students that the posters were a part of an experiment in advertising and education. Neither the teachers nor the students were told about the plans for testing. Thus each student could observe or ignore the displays as he saw fit.

Testing Methods

Significantly, the high schools cooperating in this study were the same ones used in the controlled experiment the previous year [1]. In this research the entire student body was exposed, but the questionnaire was answered only by the students in the ninth and tenth grade classes. Thus, a sub-sample of the previous year's universe was examined. Near the end of the school year and without advanced notive these students were tested by the same techniques and format of the previous year's study.[4] The purpose was not to measure the impact of any particular poster but rather to test the poster technique and determine whether collectively there was evidence that the posters had any impact and, if so, what?

To minimize variability in responses, a highly structured questionnaire that had a

[4]Analysis of the responses showed that 11.2 percent of the 660 students involved in the 1966 experiment recalled they had taken similar tests the previous year. Any bias growing out of the previous year experiences was unknown. For a few students the prior year's experience could have been a significant event, but for the sample as a whole the possible carryover would be relatively small.

minimum of open-end questions was used. Also, each student completed the balloon captions in projective type drawings that involved teenagers in six different beverage choice situations designed to explore for attitudes about the acceptance of milk drinking under the conditions shown. In making the final analysis, each individual was given a score designed to measure attitude, knowledge, family status and consumption levels. For this purpose, responses to selected questions were weighted and combined into a single figure that could be used for comparisons.

Scoring Method

Attitude scores were determined by weighting responses to questions about the student's choice of beverages for meals and snacks, the projected use of beverages for social occasions, and the beliefs about whether milk was fattening. The possible range of scores was from 1 through 22. An individual score below 9 was considered low, from 10 through 13 medium, and a score above 14 was considered to be a high one.

The knowledge scores were based on the answers to questions about nutrients in milk, nutrition and teenage needs and their knowledge about the four food groups as related to milk and nutrition. The range for individual knowledge scores was from 1 through 17. Scores below 9 were considered to be low, those from 10 through 13 medium, and scores above 14 were considered to be the highest level.

Students were not asked about their family incomes nor were they asked anything about what they conceived their social status to be. Both factors are known to influence milk consumption and food habits. To get some measure of the income and social status, a special index was constructed. The method of Calhoun [2], which considers the prestige rank of the father's occupation and the educational levels of both parents, was used in combination with the North-Hatt Scale for assigning a rank to the father's occupation [3]. This socio-economic score tended to combine education, occupation and related income in a single scale. The possible ranges under this scoring system were from 1 through 30. The distribution of these scores was such that a score of 7 or less resulted in placing that individual in a low grouping. Scores from 8 through 16 were the middle groupings and those with scores of 17 through 30 were considered to have a high level of income or status. Consumption scores were made up by weighting the number of glasses of milk drunk and the number of times ice cream, yellow cheese and cottage cheese had been used for a daytime or bedtime snack. Consumption scores ranged between 1 and 22. Scores below 7 were considered to be low, 8 through 11 medium and 12 and over placed the student in the high consumption grouping.

Choice of Posters Displayed

For the purpose of this experiment, five sets of posters were displayed during the school year. A poster picturing the four basic food groups was placed in the center along with other posters chosen to cover a diversity of youth interests. All had a central thought related to health and good nutrition and, yet, the visual components were quite different in subject and composition. Accordingly, each student was forced to identify the relationships to himself and/or make whatever sense he wanted to from the individual and

group collectively.[5] To give some continuity, the display schedules were timed so that they would relate to seasonal school activities and events. The posters were allowed to stay in place no fewer than 10 and no more than 14 school days. Twelve different posters were used and the aggregated viewing time was 54 days, an equivalent of about one day out of every three during the school term.

The grouping and the month during which the groups were on display are summarized as follows: (Also see Appendix A.)

Group I. Balanced Meal and Good Nutrition (displayed in October).

a. A Guide to Good Eating
b. Make Lunch Count
c. Three Cheers for a Big Smile

Group II. Personality and How You Look (displayed in November).

a. Four Food Groups
b. How Do You Look, Horrible Habits
c. How Do Others See You

Group III. Milk and Growth (displayed in February).

a. Food Value of a Quart of Milk
b. Milk Made the Difference

Group IV. Importance of a Good Breakfast (displayed in March).

a. Guide to Good Eating
b. Ready for Breakfast
c. Breakfast Might Have Helped—Its Time for a Milk Break

Group V. Physical Fitness and Sports (displayed in April).

a. Four Food Groups
b. Eat Well—Soft Ball
c. Looking for the Right Weight

It should be noted that the poster "A Guide to Good Eating," which describes the "Four Basic Food Groups," was shown in October and again in March. A similar but somewhat simplified poster, "Four Food Groups," was displayed in November and repeated in April. The purpose of these repetitions was to provide a common thread of reference and to place emphasis on good nutrition.

Poster Locations

The construction, classroom locations, and hallway arrangements in the four cooperating high schools tended to channel students into different parts of the building. There was no universal center of activity. Therefore, to insure a complete coverage in each school, five sets were used. The locations chosen were at some prominent place: (1) in the cafeteria, (2) in the gymnasium, (3) above the main bulletin board, (4) in the corridor or lobby near the main door enrance and (5) in one other well lighted location such as in the hallway and at the end of a passage way. The primary purpose of the multiple locations was to insure that every student in the schools would have an opportunity to see and possibly study the posters' contents. The multiple locations also provided repetition of exposure for many.

The Evaluation Panel Function

Students enrolled in marketing and/or business and distributive education classes

[5]The themes were not made known to the students. The individual posters were selected from the National Dairy Council educational materials. Reproductions of the posters used for each group display are shown in Appendix A.

were asked to help the investigators in assessing the merits of the poster project. Class members were told about the study being undertaken and asked to cooperate in making certain evaluations. They were assured that in making the evaluations they were not to be graded in any way.[6]

Each member of the evaluation panel was asked to give his own personal opinion about how other high school students would rate each set of posters throughout. Would students be interested or resentful? What would be the best location for conveying the message? What would be its relative ability for attracting attention and communicate? They were then asked to consider each of the posters separately and to rate each according to what they thought the interests, clarity and attention-getting power of each would be.

To get the panel evaluations, each set of posters was taken to the classrooms just prior to the time they were to be displayed elsewhere. The cooperating students were shown the posters, told what theme the investigators had in mind, and given rating forms developed for testing purposes. On the rating forms the students were asked: (1) to consider each location to be used and to rank them according to their effectiveness; (2) to rate each of the sets of posters on expected student interests, i.e., would there be much or little; and (3) to consider the suitability of the individual posters selected. For the later evaluation, students were given a list of individual characteristics and asked to rate the merits of each on a seven point scale with opposite value terminals. Before going into other analyses, the results of summarized information from the teenage evaluation panel will be reviewed.

[6]The panel objective was to get the opinions of teenagers among those who would have more than casual interest but were not technical experts. While all students in the various classes took part in the evaluations, a sample of 50 boys and 50 girls drawn at random was used in the final analysis.

THE TEENAGE PANEL EVALUATIONS

Through special arrangements with the cooperating schools, no restrictions were placed on where the posters could be put up. Accordingly, the investigators decided on five places in each school on the basis of what they thought would best serve the purposes of the experiment.[7] All of the locations were considered to be satisfactory. Yet, some of the conditions of display were less than ideal. The panel members, after a brief period for observation, recognized several problem areas. For example, they stated in some locations spatial limitations made it difficult to view, examine and study the contents without interference. They pointed to heavy traffic in the passageways, to the problems of congestion at some locations, and to the almost universal preoccupation of students with other matters. Yet, realism dictates that the poster be placed in a wide variety of circumstances, many of which were less than ideal. Elements of distraction are inherent wherever posters are used. This fact must be kept in mind in this as well as the later sections of this report.

Panel Appraisals

The panel did not agree on the best location for each purpose, but a consensus

[7]No posters were placed in classrooms or in the school library because the experiment did not deal with posters in the teaching or study situations. Research previously done shows clearly that the use of posters in the classroom to supplement teaching and assignments represented the highest level of efficiency in their use.

that rated display locations generally in order or rank is as follows:

1. The cafeteria.
2. The school bulletin board.
3. Hallways and corridors.
4. The gymnasium.
5. Corridors, stairways and others.

In the initial ratings, the school bulletin board was rated first, but it became quickly apparent that while most students would pass the bulletin board the time involved was short; students were looking for other kinds of things like notices and the posters did not appear to generate much notice. Thus, the bulletin board became second in rank. After the first exposure of posters, the cafeteria became the Number 1 position and, generally, held this position. Not only did the cafeteria provide a prominent place, but it was one where the main ideas and details of information could be examined. The third-rated location was the hallway. This choice was based on the fact that most students would pass the display. The gymnasium ranked fourth, mostly on the basis that organized classes in health and physical activities were conducted there. Girls generally rated the cafeteria location lower than did boys. They rated the bulletin board lower and the gymnasium higher than did boys.

Without question the locational factor is a very important one in the use of the poster technique. Besides a prominent place to be seen, the viewers must be able to read and even study the contents with a minimum of interference. Classrooms, libraries, cafeterias and similar places that favor the learning situation are better than areas of congestion and heavy traffic, according to the panel appraisals.

Where the Teenage Interests Lie

The responses of the panel to the individual posters clearly demonstrated that there were wide differences of opinion on both the subject matter and its appeal. A further study of the rating showed that the variety and scope of teenage interests were adequately covered for the purpose of this research. Accordingly, no attempt was made to evaluate the individual posters outside their collective ability. Almost all had been proven to be effective where they had been used as the producers intended. Nevertheless, through a summary of panel rating, it was possible to separate which of the sets generated greatest interest and through the recall of individual posters related it was possible to draw some broad conclusions.

A careful study of the percentage values in the columns of Table 1 indicates wide diversity in the impacts of the poster groupings. The rankings show that every category but "The Importance of a Good Breakfast", (Group IV) rated between first and last in one or more of the evaluation items. These rankings are given in the postscripts to the percentages. Furthermore, there were somewhat different overall values expressed in the interests of the boys and girls tested.

To show this difference, a priority index was constructed by assigning sequentially the ranks of percentage for each sex and summing horizontally. Based on the aggregate of the rank scored, the highest priority overall rating

TABLE 1

EVALUATIONS OF POSTER GROUPS BY MEMBERS OF MARKETING, BUSINESS AND DISTRIBUTIVE EDUCATION CLASSES
(50 Boys and 50 Girls Panel)

Group Display	Got Attention of 70% or More		There was a Clear Message		A Subject of Definite Interest		Communication Impact to 70%				Sum of Rankings	
							Read Headings		Read All			
	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl
	(1)		(2)		(3)		(4)		(5)		(6)	
	Expected peer responses—percent											
I. Balanced Meal, Good Nutrition	57^{1}	59^{1}	25^{5}	31^{5}	22^{3}	34^{2}	15^{4}	20^{3}	4^{5}	12^{1}	18^{3}	12^{2}
II. Personality, How You Look	33^{3}	33^{4}	43^{4}	41^{4}	18^{5}	20^{4}	15^{3}	24^{2}	7^{3}	10^{2}	18^{4}	16^{3}
III. Milk and Growth	26^{5}	33^{5}	88^{1}	95^{1}	20^{4}	22^{3}	11^{5}	15^{5}	6^{4}	9^{4}	19^{5}	18^{4}
IV. Importance of Good Breakfast	32^{4}	45^{2}	49^{3}	71^{2}	24^{2}	42^{1}	24^{1}	26^{1}	16^{1}	10^{3}	11^{2}	9^{1}
V. Sports, Physical Fitness	37^{2}	37^{3}	64^{2}	69^{3}	33^{1}	17^{5}	15^{2}	17^{4}	12^{2}	8^{5}	9^{1}	20^{5}
Grouped Average	37	41	54	61	23	27	16	21	9	10		

Note: Superscripts indicate ranking sequence.

(lowest total score) for the boys and girls separately were as follows:

Boys

1. V Sports and Physical Fitness
2. IV Importance of Good Breakfast
3. I Balanced Meals—Good Nutrition
4. II Personality—How You Look
5. III Milk and Growth

Girls

1. IV Importance of Good Breakfast
2. I Balanced Meals—Good Nutrition
3. II Personality—How You Look
4. III Milk and Growth
5. V Sports and Physical Fitness

All sets of charts contained technical information along with other ideas. In every case, the display was sufficiently complex to require more than casual observations. The panel evaluation of areas of interest indicated boys were interested by sports and physical fitness. Girls were more concerned with good nutrition, balanced meals and personality. On the average and for all of the areas tested (attention, clarity, intensity of interest and the inclinations to read the contents), the

percentage of girls expected to respond was higher than that for the boys. The correctness of these expectations is borne out in the analysis that follows.

RESPONSES OF THE NINTH AND TENTH GRADE STUDENTS

When asked whether they had seen or heard anything at school to influence their choice of beverages, 17 percent of the boys and 19 percent of the girls specifically mentioned the posters. Twenty-one percent of the boys and 22 percent of the girls mentioned things other than the posters that had influenced their beverage choices (Table 2). However, when the students who had not been exposed to posters were asked whether they had seen or heard anything at school to influence their beverage choices practically none (less than one-half of 1 percent) mentioned posters and only 6 percent mentioned other things.[8]

This strongly suggests that, consciously or not, the display posters had: (1) directly influenced the beverage choices of some of the respondents, (2) created an awareness, and (3) made the exposed students more knowledgeable concerning beverage needs. It follows that, if the posters were effective, their impact could be measured by changes in milk-use patterns.

[8]The control group from the 1966 experiment will be used as a bench mark for this and other comparisons. This was intended in the original design of the study. The same schools, the same sample and universe, and the same analytical and technical methods were used.

TABLE 2

RESPONSES–HAVE YOU SEEN OR HEARD ANYTHING AT SCHOOL TO INFLUENCE YOUR CHOICE OF DRINKS

	Anything to Influence Choice					
	Boys		Girls		All	
	No.	%	No.	%	No.	%
No	203	62	189	59	392	60
Yes						
Not posters	71	21	71	22	142	22
Posters	57	17	61	19	118	18
	331	100	321	100	652	100

Beverage Choices

Milk proved to be the most popular beverage among the ninth and tenth graders for both the main meals and snacks. It was most preferred for breakfast, lunch and for a bedtime snack. Fruit and vegetable juices were used mostly for breakfast and a mid-morning snack but were used by a relatively small proportion of teenagers at other times of day. Soft drinks, on the other hand, were widely used throughout the day and were close rivals of milk for both the afternoon and evening snack times (Table 3). Coffee and tea were used by nearly a fourth of the students for breakfast and supper but by lesser proportions at other times. The use of these beverages at bedtime was negligible.

Use Patterns

The choices of beverages for the various occasions just described were those of the students who had seen the poster experiment. Obviously, any influence the posters may have had would be reflected in their answers. Accordingly, a table was constructed to determine whether the responses of those who had seen the posters differed from those who had not. By using the responses of the unexposed groups as a benchmark and by comparing the percentage of users in each case, differences that were meaningful emerged.

The differences between the percentage of users thus determined are given in Table 4.

TABLE 3

MILK AND BEVERAGE CHOICES FOR MEALS AND SNACKS BY 334 BOYS AND 326 GIRLS IN THE NINTH AND TENTH GRADES WHO HAD SEEN THE POSTERS

Beverage Choices	Percent That Used	Main Meals			Snacks			
		Breakfast	Lunch	Supper	Mid-morning	Mid-afternoon	Evening	Bedtime
		Percent choosing						
Milk								
Girls	82	54	50	44	46	46	38	57
Boys	91	54	57	47	50	39	38	53
Juices—Fruit, Vegetable								
Girls	52	22	3	3	14	5	10	7
Boys	52	14	5	6	10	3	6	6
Soft Drinks								
Girls	76	1	26	13	15	41	34	11
Boys	81	0	24	10	14	45	35	13
Tea or Coffee								
Girls	53	20	14	29	7	3	3	0
Boys	57	27	8	24	7	3	5	1

TABLE 4

PERCENT BY WHICH THE USERS OF THE BEVERAGES BY THE STUDENTS WHO HAD SEEN POSTERS DIFFERED FROM THOSE WHO HAD NOT

Meal or Snack	Milk		Juice		Soft Drinks		Coffee or Tea	
	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys
	percent							
Breakfast	+ 2	− 6	− 1	0	0	0	− 1	+ 4
Lunch	+ 2	− 2	0	+ 2	+ 8	+ 8	− 7	−13
Supper	+ 8	0	+ 2	+ 1	+ 5	+ 4	−13	− 8
Mid-morning	+12	+11	0	+ 2	− 1	−12	− 1	+ 2
Afternoon	+13	+ 2	+ 3	+ 1	−13	− 3	+ 1	0
Evening	+ 2	+ 1	+ 2	− 2	− 4	+ 2	− 1	+ 1
Bedtime	+ 2	+ 2	+ 1	0	0	+ 2	0	− 1

A study of the changes associated with each of the beverage choices suggests the posters were having measurable influence. For example, the percentage of girls who chose milk as a beverage was consistently higher among those who had seen the posters than among those who had not. Among the users, the percentage who chose milk as a mid-morning snack was 12 percent higher than the control group and for the afternoon snack, 13 percent higher. Among the boys, the users of milk for mid-morning snacks were 11 percent above the control group. Boys also increased the use of milk with the other snacks, but these gains were somewhat offset by a reduction in the percentage using milk for breakfast and lunch. In looking for changes in the percentage of students who used fruit and vegetable juices on the various occasions, practically no change was shown for breakfast and small but generally positive changes on most of the other occasions. On balance, the percentage of those using the juices rather consistently was above that of the control group with which it has been compared. There were also some shift in the pattern of use for soft drinks. The percentage of users among exposed students was less for their snack time uses, but these reductions were more than offset by increased percentages taking soft drinks with their noon and suppertime meals.

In the case of tea and coffee, however, there were indications of a decline in use as well. The percentage of the boys in the poster group who used tea and coffee for breakfast showed a gain over the control, but there were substantial reductions in the percentage of both boys and girls choosing these drinks at lunch and supper. Furthermore, it is impossible to tell from these figures alone what the impact of the posters might have been on consumption of the beverage during a day's time. To answer this question, the amount of each beverage drunk on the day prior to the test was determined and the average amounts used by the exposed student was calculated and compared with the same figure secured from the control groups.

Changes in Consumption

For all of the beverages except tea and coffee, the daily consumption of the respondents who had seen the posters averaged higher than for the control groups who had not. For example, a comparison in the milk consumption of girls shows that girls in the control groups drank 1.75 glasses per day on the average and girls who had been exposed to the posters, 1.9 glasses. The difference was 0.15 of a glass daily, or a gain of 8.6 percent for the poster group. The percentage of milk drinkers was 81.2 for the control group and 82.0 for the poster group. Similar observations can be made for the boys and for both boys and girls in the choices of the other beverages as well. In all of the observations where consumption increased, the average levels of consumption increased at a faster rate than the number of users (Table 5).

For all of the beverages studied, the average daily consumption for boys was larger than that for the girls. At the end of the

TABLE 5

AVERAGE AMOUNTS OF MILK AND OTHER BEVERAGES DRUNK DAILY AND PERCENTAGE OF USERS

Beverage	Girls		Boys	
	Glasses (8 oz.)	Users %	Glasses (8 oz.)	Users %
Milk				
Control	1.75	81.2	2.99	90.5
Exposed to Posters	1.90	82.0	3.10	91.4
Percentage Change	+8.60	+0.8	+3.70	+0.9
Juice, Fruit, Vegetables				
Control	0.66	51.2	0.72	48.2
Exposed to Posters	0.80	51.7	0.90	51.8
Percentage Change	+21.20	+0.5	+25.00	+3.6
Soft Drinks				
Control	1.26	81.2	1.41	77.1
Exposed to Posters	1.30	76.5	1.53	80.7
Percentage Change	+3.20	-5.8	+8.50	+4.7
Tea and Coffee				
Control	1.35	68.4	1.37	64.1
Exposed to Posters	1.10	53.3	1.30	57.3
Percentage Change	-18.00	-22.1	-5.10	-10.7

poster experiment, girls reported milk drinks that averaged 1.9 glasses daily, and boys 3.1 glasses. Eighty-two percent of the girls and 91.4 percent of the boys were found to be users. Next in order in the quantities consumed were soft drinks, tea and coffee and the fruit and vegetable juices. These juices were low in the proportions of users, 52 percent, for both the boys and girls. In contrast, coffee and tea were used by 53 percent of the girls and 57 percent of the boys, while about 77 percent of the girls and 81 percent of the boys were users of soft drinks.

Dairy Products Consumption

Information on whether the ninth and tenth graders had consumed any ice cream, yellow cheese or cottage cheese for a daytime or bedtime snack during the previous week was determined. Three hundred and seventeen girls and 316 boys responded. Summaries of the responses are given in Table 6. Ice cream was the favorite, with 79 percent of both boys and girls having eaten it at least once for a daytime snack. Yellow cheese had been used by about 45 percent of both sexes, while cottage cheese was reported by 31 percent of the girls and 20 percent of the boys. All of the dairy foods were used for between meal and bedtime snacks. In most cases, the proportions of users were somewhat higher for those who had seen the posters. But there were truly remarkable changes in the snack use of cottage cheese. The percentage of users ranged from 10 to 16 percent for the control group. This percentage of users nearly doubled for those exposed in the poster experiment; the total increase was more than 90 percent and it affected both the boys and girls in nearly the same proportions. Without question, the changes just observed improved the overall diets and were especially valuable where they were an offset to milk deficiencies

TABLE 6

POSTER EXPERIMENTS–DAIRY PRODUCTS

Choices of Ice Cream, Yellow Cheese, Cottage Cheese for Between-Meal and Bedtime Snacks

Production Choices The Occasion of:	Control	Boys Exposed to Posters	Change from Control	Control	Girls Exposed to Posters	Change from Control
	percent					
A. Between-meal Snacks (past week)						
Ice cream	78	79	+ 1	75	79	+ 5
Yellow Cheese	37	44	+ 19	46	45	- 2
Cottage cheese	12	23	+ 91	16	31	+94
B. Bedtime Snacks						
Ice cream	67	72	+ 7	62	64	+ 3
Yellow cheese	37	39	+ 5	34	33	- 3
Cottage cheese	10	20	+100	11	20	+81

among the girls. In this connection, it is useful to review several of the responses to questions about fattening foods in general.

Milk and Dairy Foods Considered Not Fattening

Neither the boys nor the girls in the poster and control groups considered the milk and dairy foods to be fattening. When asked to list the foods they considered to be fattening, 52 percent of all the students mentioned starchy foods, 24 percent said fatty or high-fat foods, and 16 percent listed combinations of starchy and fatty foods including butter. Less than 2 percent mentioned milk, milk shakes or yellow cheese. Only 5 percent, mostly boys, said ice cream was fattening (Table 7). A review of the list of foods named by the control groups was very similar in pattern to those in the poster groups. Apparently most students in the 13-16year age groups are not weight conscious. Very few (less than 1 percent) of all the teenagers tested reported they were allergic to milk and dairy products and gave this as a reason for not using them.

OTHER FACTORS AFFECTING CONSUMPTION

Previous research in the regional food marketing project had indicated that knowledge, attitude and income levels were factors affecting the use of dairy products [1, 4]. To determine the significance of each of these factors as related to the teenagers in this project, a series of questions were used.

Knowledge of Milk Nutrition

A first step was to test the students' knowledge about the importance of milk

TABLE 7

RESPONSES OF TEENAGERS ABOUT FOODS THEY THINK FATTENING

Type of Food Mentioned	Food Mentioned as Fattening—Frequency					
	Boys		Girls		All	
	(No.)	%	(No.)	%	(No.)	%
1. Starchy	(133)	45.6	(182)	57.4	(315)	51.8
2. Fatty	(75)	25.8	(72)	22.7	(147)	24.2
3. Dairy, starch, and fatty	(47)	16.2	(51)	16.1	(98)	16.1
4. Ice cream	(20)	6.9	(9)	2.8	(29)	4.8
5. Yellow cheese	(7)	2.4	(0)	-0-	(7)	1.2
6. Milk shakes and other dairy	(5)	1.7	(2)	0.6	(7)	1.2
7. Milk	(4)	1.4	(1)	0.3	(5)	0.7
Totals	(291)	100.0	(317)	100.0	(608)	100.0

among high school students. Each respondent was asked to state whether he believed the needs for milk among high school teenagers would be greater, the same, or less than before entering high school (Table 8). Sixty-three percent of the boys and 58 percent of the girls indicated the need was greater, and only about 8 percent less. According to the consensus, the consumption of milk by teenagers in high school should equal or exceed that which they had consumed in prior years.

In a second series of questions each student was asked to rate milk and cottage cheese as a source of calcium and riboflavin, two important nutrients commonly low in the teenage diets. Seventy-three percent of the boys and 85 percent of the girls rated fluid milk as a good source of calcium. Fifty percent of the boys and 60 percent of the girls rated milk as a good source of riboflavin. Cottage cheese was given a good rating for calcium by 60 percent of the boys and 74 percent of the girls (Table 9). There was more uncertainty about the riboflavin in cottage cheese. Among all the students, fewer than half made the correct interpretations. In all of the tests for knowledge about milk components and their functional relationships to good nutrition, the girls averaged higher than the boys. But many factors other than correct knowledge are known to influence teenagers consumption patterns. Especially important are their attitudes, income and social acceptance of the individual and those of their peers. These questions will be further explored as they relate to milk drinking among the ninth and tenth grade students.

Attitudes, Knowledge and Socio-Economic Factors

To measure the relationships between attitudes, knowledge and income

TABLE 8

EXPRESSED NEED FOR MILK NOW AS COMPARED TO NEEDS BEFORE ENTERING HIGH SCHOOL (325 boys and 325 girls).

	Expressed Relative Needs			
	More	Same	Less	Total
	---------- Percent ----------			
Boys	63	29	8	100
Girls	58	35	7	100
Boys and girls	60	32	8	100

TABLE 9

KNOWLEDGE OF COMPONENT VALUES OF MILK AND COTTAGE CHEESE
(330 Boys and 326 Girls)

Item	Ratings Given Item			
	Good	Poor	Don't Know	Totals
	percent			
I. Fluid Milk				
A. Calcium				
Boys	73	9	18	100
Girls	85	5	10	100
B. Riboflavin				
Boys	50	18	32	100
Girls	60	16	24	100
II. Cottage cheese				
A. Calcium				
Boys	60	12	28	100
Girls	74	9	17	100
B. Riboflavin				
Boys	40	19	41	100
Girls	51	16	33	100

(socio-economic) status and milk drinking, the students who scored high and low in each of the above mentioned categories were tabulated according to the number of glasses of milk each had consumed the previous day. It was assumed for purposes of this comparison that students who drank three or more glasses had met minimum dietary standards, while those consuming less than one glass had definitely not. The data in Table 10 show that only 9 percent of the students who scored low in attitudes drank three or more glasses of milk the previous day, and that 59 percent consumed less than one. This means that only 1 in 10 of the students with low attitude scores reached a satisfactory level of fluid milk consumption. There were similar though less pronounced differences in the relationships between knowledge and milk drinking and in the economic scores and milk drinking. Among the students with low knowledge scores, the average amounts of milk drunk would be low as compared with those who rated high in knowledge. A similar statement applies to comparisons between groups in the high and low socio-economic status. Students with limited economic resources tended to drink fewer glasses of milk than those more favorably situated. The most favorable situation with respect to milk

TABLE 10

RELATIONSHIP BETWEEN THE NUMBER OF GLASSES OF MILK AND THE ATTITUDE, KNOWLEDGE AND SOCIO-ECONOMIC SCORES
(326 girls and 334 boys)

	Glasses Consumed Previous Day			
	Three or More (Satisfactory)	One or Two (Limited)	Less than One (Low)	Total
	(1)	(2)	(3)	
	percentage			
I. Low-scoring Group				
Attitude	9	32	59	100
Knowledge	28	32	40	100
Socio-economic	21	40	39	100
II. High-scoring Group				
Attitude	40	32	28	100
Knowledge	38	33	29	100
Socio-economic	38	31	31	100

drinking is to be found in combinations among students who have a favorable attitude, who are most knowledgeable about its nutritional characteristics, and who are also in the most favored economic groups. Students with a poor attitude, limited knowledge and low socio-economic status are the poorest prospects for milk drinking.

Speaking generally, the attitudes and consumption scores of boys were somewhat higher than those for girls. The opposite was true of knowledge scores. For both boys and girls, knowledge scores were more closely associated to socio-economic levels than to any other factor investigated. Furthermore, the socio-economic status of the families of boys and girls was the same. Similarities of background would lead one to expect similar responses. This proved to be true for the main items of consideration.

On the other hand, there were contradictions. Girls in the highest socio-economic groups were the best informed of all; yet, more than any other group, there was an antimilk attitude. Milk drinking was also affected by this negative attitude. For boys in the highest income category, the response was the opposite. Attitudes, knowledge and consumption all were at comparatively high levels. There appeared to be little antimilk sentiment. The reasons for the discrepancies within the segmented teenage groups, just noted, are not clear from this study. Unquestionably, within each of the low, middle and high categories are teenagers with different sets of values,

differences in ethnic and family backgrounds and in the economic and social consciousness. But none of these can be considered as constant or fixed factors; and, accordingly, if the right motivation is present, appreciable changes can be made.

SOCIAL ACCEPTANCE OF THE MILK BEVERAGES

A lack of the acceptance of milk beverages for social occasions is often pointed out by those who seek to expand its use. To test the validity of this claim a series of projective-type drawings were used. The selected school and environmental situations were chosen, and for each an appropriate drawing that incorporated balloon-type captions and blanks was presented. The students were asked to complete the blanks and to indicate what they believed would be the beverage choice of each of the individuals shown under the circumstances portrayed.

Mixed-Company Situations

Three of the mixedcompany situations that were projected have been summarized in sections A, B and C of Table 11. The first situation involved a boy and a girl at a skating party. Eighty percent of the girls and 70 percent of the boys said no milk would be chosen. Eight percent of the boys and 5 percent of the girls indicated that both the boy and girl pictured would have taken milk. Either a boy or a girl would have chosen milk in somewhat similar proportions (Section A). The second projected drawing showed two couples at a square dance. In this setting about 70 percent of the respondent boys and girls indicated that no milk would be taken by anyone on the occasion. The remaining 30 percent indicated that milk would be taken by some participants (Section B). However, when the setting for milk drinking was shifted away from a party to a projected home situation, the acceptance of milk rose sharply (Section C). More than two-thirds indicated that one or the other or both the boy and the girl would choose milk. The acceptance patterns for boys and girls were very similar.

Other Situations Projected

To test whether the boys and girls would react differently to their own sex than they would in mixed company, projective drawings that involved only boys were given to boys and an identical set of situations relating only to girls were tested among girls. These are reported in sections D, E and F of Table 11. In all cases where only members of the same sex were involved, the acceptance of milk as a beverage greatly improved over the mixed-company situations. In Section D, for example, that shows two teenagers of the same sex in a home situation, 39 percent of the boys and 40 percent of the girls responded that milk would be their choice. And 35 percent of the boys and 39 percent of the girls said that one of the two would have milk. The rejection by both parties was 26 percent for boys and 21 percent for girls.

There were two other tests that separated the boys and the girls. The first involved a committee ordering the beverages for their respective club meetings. The question was raised about ordering milk in addition to cokes and orange drinks. Sixty percent of the girls and 63 percent of the

TABLE 11

TEENAGERS' ACCEPTANCE OF MILK–RESPONSES TO PROJECTED SOCIAL AND SNACK SITUATIONS

The Projected Situation	Acceptance Patterns for the Occasions			
	Both accept	Only the boy accepts	Only the girl accepts	Both reject
	percent			
A. Skating Party at Milk Machine				
(Boy and Girl Situation)				
Boy's response for both	8	6	16	70
Girl's response for both	5	6	9	80
B. Square Dance Refreshments				
(Boy and Girl Situation)				
Boy's response for both	11[a]	5	5	69
Girl's response for both	12[a]	2	2	71
C. Walking Home–Refreshments on Arrival				
(Boy and Girl Situation)				
Boy's response for both	9	40	20	31
Girl's response for both	6	42	16	34
D. After School at Refrigerator				
(Boy-to-Boy and Girl-to-Girl Situation)				
Boys speaking of boys	39	35	*	26
Girls speaking of girls	40	*	39	21
E. Club Planning Committees				
(Refreshments)				
Boys' club activity	63	*	*	37
Girls' club activity	60	*	*	40
F. Bedtime Snack at Refrigerator				
(At Home)				
Boys alone	72	*	*	28
Girls alone	73	*	*	27

[a]Some combination of boys and girls that did not fit the categories defined made up the missing percentage.

*The categories did not apply for the situation projected.

boys favored "the milk order" for their respective meetings (Section E). The rate of acceptance was well above any of the mixed-company situations. Again, in a home setting with the boys or the girls choosing a bedtime snack, milk was chosen by 73 percent of the girls and 72 percent of the boys (Section F, Table 11).

Boys and Girls Agree on Beverage Choices

A review of all of the patterns established by teenagers in response to the projected social and snack situations shows an almost identical pattern of choices. In the boy-girl party situation, milk was given a relatively low priority; for the home situations and for separate club meetings there was substantial agreement that milk would be all right. It had a high priority for bedtime snacks. In all cases it was shown that the acceptance of milk by boys and by girls when the sexes were separated and in separate company was greater than for mixed-company settings. But in almost all cases both the boys and the girls knew pretty well what the beverage choices of the opposite sex would be in each of the projected situations. Even on the question about fattening foods, there was no major difference that would separate the boys and girls. This does not deny the existence of many individual personal likes and preferences. These differences are partly due to different physical and nutritional needs but also of major significance is the question of motivation—attitude, knowledge and income—already discussed.

SUMMARY EVALUATION

The objectives of this study were to explore poster techniques as an educational device, test the impacts of informational posters placed outside the classroom situations, and determine how teenagers reacted to posters stressing good nutrition and the importance of milk in a balanced diet. It was hypothesized that poster impacts were measurable.

Four Kentucky high schools with a total enrollment of approximately 2,500 students took part in the experiment. After having been exposed to a series of posters in the school environment, all of the ninth and tenth grade students from these high schools completed a questionnaire designed to test their attitudes, knowledge and consumption patterns.

The findings based on the information supplied by 668 teenagers cooperating in the study showed that the posters had: (1) directly influenced the beverage choices on different occasions, (2) made exposed students more knowledgeable about food values and nutritional needs and (3) created an awareness of the part played by milk and dairy products in personal health and well-being. Also, it was found that the exposed groups rated higher in attitude, knowledge and consumption scores than did the unexposed students.

The study further showed that the ninth and tenth grade students who had seen the posters were responsive in several measured ways. First, the posters stimulated beverage consumption that improved the nutrition of many teenagers. The increased milk drinking, especially among girls, is notable. Second, both fruit and vegetable juices were consumed in markedly higher amounts by boys and girls. Thus, related dietary improvement resulted. Paranthetically, the soft drinks, too, benefited from the posters but tea and coffee drinking did not.

A review of all of the patterns established by teenagers in response to the projected social and snack situations shows an almost identical pattern of choices. In the mixed-company party situation, milk was given a relatively low priority; for the home situations milk drinking rated high. Since the students are conditioned to regard milk as a food, it is not surprising to find that milk ranked at the top of the list of beverages for main meals and evening snacks. The use patterns showed that it rated well in competition with soft drinks for daytime snacks at school. It had a low priority in party situations involving boys and girls together, but it was quite acceptable for club situations and similar occasions in which boys and girls were separated. It is highly significant, too, that in the home where milk was being considered by two girls or by two boys, milk was the preferred drink much more often than when a boy and a girl were involved in similar situations. But in almost all cases both the boys and girls knew pretty well what the beverage choices of the opposite sex would be in each of the projected situations. Even on the question about fattening foods, there was no major difference that would separate boys and girls.

Accordingly, what emerges from a summary evaluation of the overall data for the 341 boys and 327 girls tested is a high degree of conformity, i.e., both sexes responded in much the same way. The most significant difference between the boys and girls responding were the quantities consumed. Part of this difference is known to be due to different physical and nutritional needs, but there are also other factors to be considered. Especially important among the factors are personal motivations such as attitude, knowledge and income.

A favorable attitude was found to be the most important single factor influencing the level of consumption for milk and dairy products. Knowledge was also an important factor and had a greater influence on consumption than did the income status of the families. Significantly, teenagers from the higher income families were also those whose knowledge scores tended to be high. Nevertheless, a disproportionate number of girls from high-income families were found to have a negative or antimilk posture that limited milk drinking among girls in this income group. The suggestion that girls from the high-income families were concerned that milk would be fattening or that they were especially opposed to milk did not prove to be true. In fact, very few, less than 2 percent, of the ninth and tenth graders tested would deny themselves milk for either of the above-mentioned reasons. Furthermore, the boys from families in the high socio-economic grouping scored higher in attitude, knowledge and consumption of milk and dairy products than did any other group. Speaking generally, the data show that the lower the attitude, knowledge and socio-economic scores, the lower the corresponding levels of milk drinking. While there are contradictions, a favorable attitude is the first step and knowledge a second step in motivating teenagers. Both of these were improved by the exposure to the educational posters in this study. Significantly, the motivation and reinforcement of the attitudes of those who were already users were easier to accomplish than to create new demands among the nonusers. This is a highly relevant point with respect to appropriate educational and promotional efforts.

Finally, the study demonstrated that poster displays can be an important adjunct

to teaching. But outside the classroom there is little compulsion to learning. Consequently, the information and motivations in posters are casual and the viewers may have to overcome all sorts of distractions. Nevertheless, posters can be used to present and dramatize situations that influence few or many persons. The result of this study showed a reasonable number of teenagers had been reached in a positive way. An overall appraisal of the results of this experiment indicates a judicious use of educational posters, such as those displayed in this study, will contribute to the information teenagers need on good nutrition and balanced diets.

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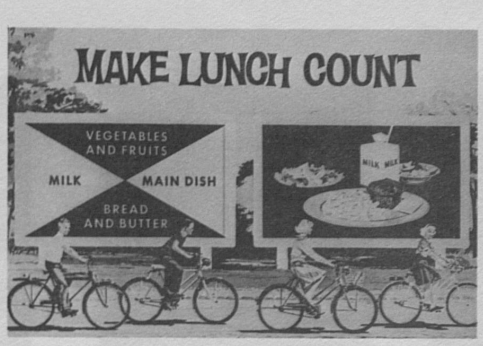
APPENDIX A

POSTER SELECTION AND GROUPING FOR DISPLAY

(a)

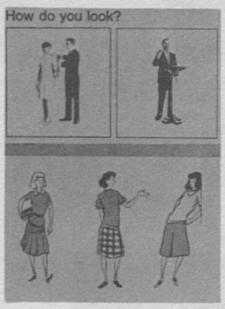


(b)

(c)

GROUP I

(a)



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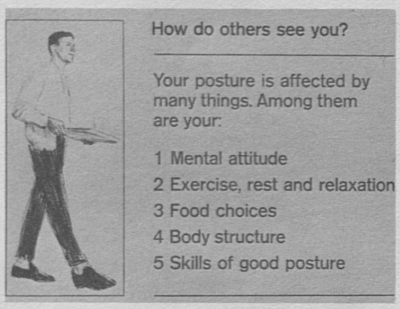
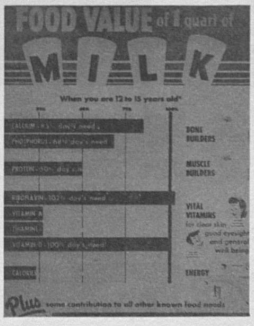


(c)

GROUP II



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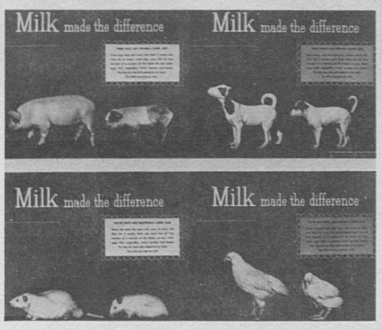


(b)

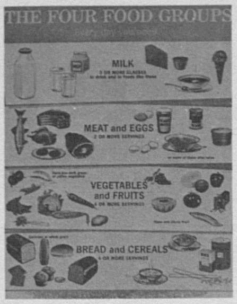
GROUP III

(a)

(b)

(c)

GROUP IV



(a)

(b)

(c)

GROUP V