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MARKET TEST OF DRY WHOLE MILK:

Nine Supermarkets, Lansdale, Pa., Area



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HIGHLIGHTS

Sales in a store test of a USDA-developed dry whole milk, called Dairy Fresh, indicate high consumer acceptance and potential commercial success, although the test was small-scale.

The market attained for Dairy Fresh in the test appeared to have no significant effect on sales of other dairy products, even though Dairy Fresh sold for 4 cents less for a quart equivalent. Sales of Dairy Fresh may therefore represent an additional market for milk. Consumers apparently purchased Dairy Fresh for special uses, such as a supplement for fresh milk and for use in camping and resort homes.

As shown by one store in the test area, an aggressive sales promotion and merchandising program will substantially increase sales of Dairy Fresh.

Followup consumer surveys in the test area showed that homemakers and members of their families reacted very favorably to the taste of Dairy Fresh. Most respondents stated that Dairy Fresh tastes as good as fresh whole milk, and could not be distinguished from it. Homemakers were favorably impressed that Dairy Fresh could be kept on hand, and is easy to store. For the most part, homemakers expressed no unfavorable opinions about Dairy Fresh. Further, the great majority of these women reported no serious problems in mixing Dairy Fresh.

Most homemakers also rated Dairy Fresh as good or better than fresh whole milk on taste, wholesomeness, or nutritious value, storage, cost, refreshing value, and richness, except that three in 10 considered Dairy Fresh less rich than milk.

Acceptance of Dairy Fresh was indicated in another way. When asked if they planned to repurchase Dairy Fresh, more than three-quarters of the homemakers said that they did. In followup among a sample of these women, 30 percent said they did repurchase the product.

MARKET TEST OF DRY WHOLE MILK:
NINE SUPERMARKETS, LANSDALE, PA., AREA

by

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INTRODUCTION

This limited study was conducted to determine whether a beverage-quality dry whole milk, when made available in retail stores, would be acceptable to consumers and to what degree acceptance was converted into retail sales.

The dairy processing industry has recognized for many years that a good beverage-quality dry whole milk with an adequate shelf life would be desirable for market stabilization and increased consumption of dairy products. Both the dairy industry and Government have been seeking a method of producing this product, which will supplement present fluid milk markets. One result is a vacuum foam dry whole milk developed by engineers at USDA's Eastern Utilization Research and Development Division Laboratory near Philadelphia. In simple terms, the vacuum foam process is the drying of milk under nonoxidizing conditions and at low temperature; that is, under vacuum. Flavor scores for this product stored at 40° F. over a 60-week period indicated a relatively small drop in flavor in the first 3 to 4 weeks and then a stable flavor that remains at a palatable level for over a year. ^{1/} For purposes of a market test the vacuum foam dry whole milk was labeled and sold under the name "Dairy Fresh." Dairy Fresh was chosen as a preference over other suggested names by USDA employees. The product was produced under pilot plant operation at the Eastern Utilization Research and Development Division.

Another product developed by the Eastern Utilization Research and Development Division is foam spray-dried whole milk. This product was rated acceptable for beverage use by food managers of eight nonprofit institutions in the Washington, D. C., area. ^{2/}

^{1/} N. C. Aceto, J. C. Craig, Jr., R. K. Eskew, and F. B. Talley. Storage Aspects of Continuous Vacuum Foam-Dried Whole Milk. Proc. E/F 189-196 (1966). 17th Internatl. Dairy Cong. Munich.

^{2/} Dunham, Denis F., Trial Use of Foam Spray-Dried Whole Milk in Selected Types of Institutions, U. S. Dept. Agri., ERS-348, 14 pp., June 1967.

METHODOLOGY

The sales test began April 15, 1968, and ended July 6, 1968. It was conducted in nine supermarkets in the Lansdale, Pa., area. Five of the supermarkets are in Lansdale, two in Montgomeryville (about 5 miles from Lansdale), and two in Souderton (about 7 miles from Lansdale). Five different firms were represented among the nine supermarkets. Seven of the nine stores had a weekly sales volume of \$35,000 to \$45,000. The eighth was over these amounts and the other under.

Since Dairy Fresh needs to be stored at 40° F. for stability, it was sold from the refrigerated dairy case.

Sales audits of four products sold from the dairy case were started 2 weeks before the test began and discontinued 2 weeks before the test ended. One nondairy product, buttermilk biscuits, was audited to provide an indication of competition for space in the refrigerated dairy case. Other products audited were fluid whole milk, fluid skim milk, and buttermilk. In addition, nonfat dry milk sold in the dry grocery section was audited. Each store was visited by an enumerator on the same day each week at approximately the same hour.

During the test, no major advertising media were used because of insufficient funds. However, when the objective is to determine product acceptance, it is possible that a better measure of acceptance can be attained without media advertising. Promotion of the product consisted of a poster mounted over a display of Dairy Fresh with in-store demonstrations in six of the nine stores on 3 days during the first week of the test period (fig. 1). In the other three stores, in-store demonstrations were held for only 2 days in each store, with each store being used for a different 2-day period. For later use in the followup consumer survey, in-store demonstrators obtained names, addresses, and telephone numbers of persons who bought the product during the introductory period. Two random samples of these people were drawn for interviews, one for personal interviews and one for telephone interviews. Later a random sample of those personally interviewed was drawn for telephone reinterviews.

THE STORE TEST

During the first week of store sales of Dairy Fresh, demonstrators were in each of six stores for 3 days and each of the other three stores for 2 days. Samples of reconstituted Dairy Fresh were given to customers, and each person who sampled the product was encouraged to make a purchase (fig. 2). Sales the first week amounted to 1,980 cans (quart equivalents). Since the product was priced two for 49¢, most purchasers bought two cans, and so Dairy Fresh was initially placed in about 1,000 homes.

As expected, weekly sales declined after the demonstrations ended. Total weekly sales during the remaining 11 weeks varied from 506 cans in the second week to 263 cans in the 10th week. The weekly average, excluding the



Try a New form of
Fresh Whole Milk



Instant Dry Whole Milk

FRESH PASTEURIZED HOMOGENIZED WHOLE MILK
FROM WHICH ONLY THE WATER HAS BEEN REMOVED
IT IS FORTIFIED WITH VITAMIN D

JUST ADD WATER SHAKE WELL AND ENJOY YOUR MILK

Figure 1.--Promotional display of Dairy Fresh in test store, Lansdale, Pa., area



Figure 2.---Customer sampling Dairy Fresh in test store while product is shown by demonstrator.

Table 1. --- Weekly sales of Dairy Fresh dry whole milk by test stores, weeks ending April 20-July 6, 1968

Store	Can (Quart equivalent) sales during weeks ending--													Total
	4-20	4-27	5-4	5-11	5-18	5-25	6-1	6-8	6-15	6-22	6-29	7-6		
1	133	22	36	6	25	18	23	26	26	18	34	24	391	
2	121	40	31	23	24	35	25	28	20	33	19	18	417	
3	143	72	54	45	22	59	51	37	43	54	55	18	653	
4	238	50	23	52	21	28	20	68	13	32	4	7	556	
5	228	48	42	12	15	16	33	20	14	18	18	2	466	
6	386	47	44	54	79	66	66	72	48	32	27	14	935	
7	451	180	89	158	153	148	140	140	200	55	100	336	2,150	
8	118	5	23	0	6	9	4	6	4	8	8	27	218	
9	162	42	41	48	60	29	33	30	25	13	13	20	516	
Total	1,960	506	383	398	405	408	395	427	393	263	278	466	6,302	

demonstration week, was 393 cans. Table 1 shows weekly sales of Dairy Fresh by store. This represented sales of 1.8 cases of 24 cans per store per week. Table 2 shows weekly tabulations of the number of stores above and below average. Only one store was able to maintain sales above average for all 11 weeks. Three stores were below average for the entire period.

The store which maintained the high sales record averaged sales of 6.4 cases per week. This high average may be explained by merchandising methods in the store. The dairy department had two men assigned full time and two others assigned part time. The two full-time men were long-time employees who were acquainted with many of the customers and who influenced them to buy. Other factors which may have attributed to the high rate of Dairy Fresh sales in this store were: (1) an excellent display of the product, (2) attitude and pride of dairy department employees, (3) competition for volume sales among departments within the store, (4) store manager's philosophy of pushing sales of new products, and (5) excellent overall store appearance.

Table 2.--Stores with sales above and below weekly average of 1.8 cases of Dairy Fresh

Week ^{1/}	:Stores above	:Stores below
	average	average
	Number	
2.....	5	4
3.....	3	6
4.....	5	4
5.....	3	6
6.....	3	6
7.....	3	6
8.....	3	6
9.....	2	7
10.....	2	7
11.....	2	7
12.....	1	8

^{1/} Week number 1 excluded.

When the sales test of Dairy Fresh was being planned, the store managers were asked to allot at least two facings (rows facing the customer) in the dairy refrigerated case for the new product. This was agreed upon by all stores; however, the high-volume store allotted 10 facings stacked three high (a total of 30 facings) in the dairy case next in proximity to fresh fluid milk.

In the high-volume store, employees appeared to take pride in their respective departments and to compete intensely with each other. This attitude was particularly evident in the dairy department. Since Dairy Fresh was given to the store at no cost, that department had some advantage over others for leading in net sales. During the last week of the test, a sign, "Last Week to Purchase Dairy Fresh," was placed before the Dairy Fresh display. During the final week, this store sold 72 percent of test area sales for that week.

This store manager seemed to believe that a new product should be merchandised, and given every opportunity to succeed, in anticipation of replacing a slow turnover item with one that would have a faster turnover. This store is relatively new and more modern than other stores in the test area. For example, the store has carpeting for about 20 feet behind, through, and in front of the checkout counters.

Dairy Fresh sales had no significant effect on the sales of other dairy products sold from the refrigerated dairy case. Sales of dairy products vary significantly within stores from week to week, but this appears to be due to factors other than competition between products in the dairy department. Dairy Fresh can, however, compete successfully for space in the refrigerated dairy case with buttermilk and, to a lesser degree, with buttermilk biscuits. (appendix tables 32-37.)

In the Lansdale area, a weekly market potential of 2 cases per store exists for a milk product such as Dairy Fresh. At least initially, this product probably would be purchased for use in camping, resort homes (seashore and mountain), and as a supplement to fluid milk.

If consumers' reactions reported in this test are representative and Dairy Fresh is sold at a sufficiently lower price (reconstituted basis) than fresh whole milk, some substitution for fresh whole milk can be expected. This study, however, furnished no basis for measuring the rate of substitution to be expected.

PRICING DRY WHOLE MILK

Since Dairy Fresh has not been introduced on the market, a selling price for it has not been established. A preliminary cost estimate made by engineers at USDA's Eastern Utilization Research and Development Division suggested that under the existing economic and supply conditions in the Philadelphia milk market area at the beginning of the market test period, Dairy Fresh could be sold retail at two cans for 49 cents or less. ^{3/}

Since the completion of the market test, a detailed cost estimate has been published. ^{4/} A summary of these cost estimates for producing and packaging vacuum foam dry whole milk in No. 10 cans for the institutional market is as follows:

^{3/} A can of Dairy Fresh reconstituted to the equivalent of 1 quart of fresh whole milk with 3.25 percent butterfat.

^{4/} Turkot, V. A., and others. Continuous Vacuum Drying of Whole Milk Foam, Food Engin., Aug. 1969.

	<u>Cents per quart equivalent</u>
Milk (3.37% BF)	9.307
Other raw materials	0.065
Packaging materials	1.747
Labor & management	1.100
Maintenance, repairs, & operating supplies	0.486
Utilities	0.933
Plant overhead costs	0.272
Fixed costs	1.569
Total factory manufacturing costs	15.480
Other costs*	5.358
Factory selling price	20.838

*Include interest on capital, research, administrative, selling costs, taxes, and net profit.

If a manufacturer prefers to produce vacuum foam dry whole milk for the retail market, the above costs apply except for the changes required to adapt to smaller packages. This would add slightly to manufacturing costs.

In the market test area at the beginning of the test, fluid whole milk was selling at 57 cents per half gallon in seven of the nine stores and 54 cents in the two others. The two stores selling milk at 54 cents are in a different pricing area, established by the Pennsylvania Milk Marketing Board. When priced at two cans for 49 cents, the differential with fluid whole milk was 4 cents per quart in seven stores and 2-1/2 cents per quart in two stores. At the beginning of the second week of the test, the price of fluid whole milk was raised to 57 cents per half gallon in the two stores. Thus the price of fluid whole milk and the price differential became uniform throughout the test area. However, at the beginning of the fourth week of the test, the price of fluid whole milk was raised to 59 cents per half gallon in the seven-store area. At this time, the Dairy Fresh price was raised to two cans for 51 cents in the seven stores and maintained at two cans for 49 cents in the other two. This kept the price differential between Dairy Fresh and fluid whole milk uniform at 4 cents per quart.

Any price advantage that dry whole milk may have over fluid whole milk appears to be due to difference in prices paid by the processor for the milk used. Milk used in the manufacture of dry whole milk is purchased by the processor at the Class II price.

Since nonfat dry milk is priced on the above basis, there is no reason to believe that the situation will change for a dry whole milk product. However, if processors of dry whole milk are required to pay Class I prices, the factory selling price per quart equivalent of dry whole milk would be increased by the difference between Class I and Class II prices.

THE HOUSEHOLD CONSUMER SURVEY

Between May 6 and June 6, 1968, 514 interviews were conducted by Chilton Research Services with 405 different homemakers in the Lansdale, Pa., area who purchased Dairy Fresh.

Three hundred and two of these homemakers were interviewed about 2 weeks after they purchased Dairy Fresh. Of this group, 109 were reinterviewed by telephone about 2 weeks afterwards. In addition to this group, 103 homemakers were telephoned about 4 weeks after they purchased Dairy Fresh. These homemakers were randomly chosen by probability methods from a group of women whose names were obtained as they purchased Dairy Fresh.

The women who were personally interviewed were questioned about their use and opinions of the Dairy Fresh they had purchased, and also about their intentions to repurchase this product. It was to measure followthrough on repurchase of Dairy Fresh that the reinterviews after a 2-week period were made.

As a control, telephone interviews were conducted with homemakers who had not been personally interviewed to obtain data on repurchase patterns of this product.

Three specially designed questionnaires were used to interview homemakers; one for those who were personally interviewed, a second for reinterviewing by telephone, and a third for initial telephone interviews.

The following descriptions identify the responses of the homemakers who were interviewed on the various questionnaires:

- Personal sample Homemakers who were interviewed in person about 2 weeks after purchase of Dairy Fresh.
- Reinterview sample Homemakers who were reinterviewed by telephone about 2 weeks after they had been personally interviewed.
- Telephone sample Homemakers who were interviewed only once by telephone about 4 weeks after purchase of Dairy Fresh.

Areas of questioning varied with each of these questionnaires: Certain questions were asked only in the personal interviews while others were asked on both the personal and telephone interviews.

Use of Dairy Fresh

By the time of the interview, most homemakers had used Dairy Fresh. As would be expected, proportionately more homemakers who were telephoned after 4 weeks had used it than women who were personally interviewed after 2 weeks.

	<u>Percentage that had used Dairy Fresh</u>
Personal sample	71
Telephone sample	92

The only significant reason given by homemakers (83 percent) for not using Dairy Fresh was that they had not yet run out of milk by the time they were interviewed (appendix table 7).

Reasons for Buying Dairy Fresh

The reason given most often by homemakers for initially buying Dairy Fresh was to have it on hand (personal sample, 47 percent; telephone sample, 41 percent).

	<u>Personal sample</u> Percent	<u>Telephone sample</u> Percent
To have on hand	47	41
Sample tasted like fresh whole milk.	31	22
Sample tasted good	23	17
Out of curiosity	21	25
Cheaper than regular milk.	17	20
Miscellaneous.	19	29

How Dairy Fresh was Used

Homemakers, for the most part, said they used the Dairy Fresh in the same ways they use regular fresh whole milk.

	<u>Users of fresh whole milk</u> Personal sample	<u>Users of Dairy Fresh</u> Personal Telephone sample sample	
	- - - -	Percent	- - - -
Ways used most:			
As a beverage.	79	72	68
In baking or cooking . .	8	12	11
On cereals	15	11	15
In coffee or tea	5	5	4

Homemakers' Likes and Dislikes About Dairy Fresh

When asked what they liked about Dairy Fresh, about half the homemakers who used Dairy Fresh said that it tastes like fresh whole milk. Other things liked about Dairy Fresh were that it could be kept on hand and was economical.

	Users of Dairy Fresh <u>Personal sample</u> <u>Percent</u>
Like Dairy Fresh because:	
It tastes like fresh milk	49
Can keep it on hand	37
Cheaper, more economical.	20
Tastes good; like the taste	12
Easy to store	12
Creamy, not watery.	11
Superior in taste to canned or powdered milk.	11
Easy to mix; dissolves easily	9
Miscellaneous	19

Only 6 percent said they disliked Dairy Fresh because it did not taste like fresh milk. Overall, there appear to be no major dislikes of Dairy Fresh. The following table summarizes the dislikes mentioned by homemakers about Dairy Fresh:

	Users of Dairy Fresh <u>Personal sample</u> <u>Percent</u>
Dislike Dairy Fresh because:	
Nothing disliked.	58
Doesn't dissolve easily or quickly.	11
It has to be mixed.	7
Doesn't taste like fresh milk	6
It leaves a film.	5
Miscellaneous	19

Use of and Reaction to Dairy Fresh by Homemakers' Families

In households where Dairy Fresh had already been used at the time of the personal interview, almost nine of 10 homemakers answered that they themselves had used the test product. In households with children under age 20, about the same proportion reported use by these children. Use of Dairy Fresh by adults other than the respondent was indicated in three out of four households (appendix table 9).

Homemakers were asked about the reaction of other family members to Dairy Fresh. For the most part, reactions of all age groups were favorable. Reactions of other family members in the personal sample to Dairy Fresh were:

Other family members who used Dairy Fresh
Personal sample

	Adults 20 or over	Children 13-19 years	Children under 13 years
	----- Percent -----		
No one knew the difference between Dairy Fresh and fresh milk	28	42	45
Liked it	25	24	33
Said it tasted like fresh whole milk	20	8	5
No favorable reaction.	15	14	15
Don't know	11	9	7
Miscellaneous.	3	3	1

As seen in the table below, the majority of homemakers reported that other family members who used Dairy Fresh did not react to it unfavorably.

Other family members who used Dairy Fresh
Personal sample

	Adults 20 or over	Children 13-19 years	Children under 13 years
	----- Percent -----		
No unfavorable reaction	77	76	81
Didn't like the taste	8	8	8
Too rich, creamy.	2	5	2

(Appendix table 10)

Reaction to Term "Dry Whole Milk"

About four homemakers in 10 (39 percent) said some member of their families reacted to the term "dry whole milk." About half of those who did react to this term reacted unfavorably, while the rest were equally divided between those with favorable or neutral reaction to the term dry whole milk:

Users of Dairy Fresh
Personal sample
----- Percent -----

Did not react to term "dry whole milk"	61	
Reacted to term "dry whole milk"	39	
Favorable		9
Neutral		9
Unfavorable		21

Homemakers' Ratings of Importance of Specified
Factors to Them When Buying Milk

Homemakers were asked to indicate on a seven-point scale (from 1, meaning very important, to 7, not at all important) how important certain reasons are to them when they buy milk. Each of these factors was considered important, with taste and wholesome or nutritious leading:

Very important--not at all important 1 2 3 4 5 6 7	Users of Dairy Fresh Personal sample <u>Average rating</u>
Taste.	1.4
Wholesome or nutritious.	1.4
Cost	2.1
Richness	2.2
Ease of storage.	2.2
Size of container.	2.6

(Appendix table 17)

Rating of Dairy Fresh on Selected Characteristics

Homemakers who were personally interviewed were asked to rate Dairy Fresh on four selected characteristics, using a seven-point scale. The majority of respondents felt that Dairy Fresh was wholesome and nutritious, good-tasting, low-cost, and rich.

The following table shows the average ratings given by homemakers for Dairy Fresh on these characteristics:

<u>"1" on the scale</u>	<u>"7" on the scale</u>	Users of Dairy Fresh Personal sample <u>Average rating</u>
Wholesome/nutritious	Not wholesome/nutritious	1.8
Good tasting	Not good tasting	2.0
Low cost per glass	High cost per glass	2.1
Rich milk	Not rich milk	2.4

(Appendix table 16)

Comparison of Dairy Fresh to Fresh Whole Milk

In the personal interview, homemakers who used Dairy Fresh were asked to compare Dairy Fresh to fresh whole milk in their own words. As seen in the summary table below, most homemakers favorably compared the taste of Dairy Fresh with that of fresh whole milk:

Users of Dairy Fresh
Personal sample

	Percent
Favorable comparisons:	
Dairy Fresh tastes <u>as good as</u> fresh whole milk-----	58
Dairy Fresh tastes <u>better than</u> fresh whole milk-----	11
Less expensive-----	10
Dairy Fresh can be stored easily-----	9

Unfavorable comparisons:	
Dairy Fresh <u>doesn't taste as good as</u> fresh whole milk-	23
Dislike the inconvenience of mixing-----	5
Don't know-----	4
Miscellaneous-----	3

Homemakers were then asked to compare Dairy Fresh to whole fresh milk on six specific factors. Eight homemakers in 10 (80 percent) said that Dairy Fresh was less expensive and easier to store than fresh whole milk. As for the other factors--taste, richness, wholesomeness, and refreshing quality--for the most part, homemakers considered Dairy Fresh equal to or better than fresh whole milk.

Users of Dairy Fresh
Personal sample
Percent

Compared to fresh whole milk, Dairy Fresh is:	
Less expensive-----	80
As expensive-----	14
More expensive-----	3
Don't know-----	3
Easier to store-----	80
As easy to store-----	16
Not as easy to store-----	3
Don't know-----	1
Richer-----	15
As rich-----	57
Not as rich-----	27
Don't know-----	1
Better tasting-----	7
As good tasting-----	73
Not as good tasting-----	19
Don't know-----	1
More wholesome/nutritious-----	7
As wholesome/nutritious-----	77
Not as wholesome/nutritious-----	8
Don't know-----	8
More refreshing-----	5
As refreshing-----	78
Not as refreshing-----	14
Don't know-----	3

Plans to Repurchase Dairy Fresh

When asked if they planned to repurchase Dairy Fresh the majority of users said they did plan to repurchase:

	Users of Dairy Fresh		
	Personal sample	Telephone reinterview sample	Telephone sample
	- - Percent - -		
Yes, plan to repurchase Dairy Fresh-----	83	80	74
No-----	5	6	18
Don't know-----	12	14	8

Paralleling the main reason given for originally purchasing Dairy Fresh, the major reason given for planning to repurchase Dairy Fresh was "to have it on hand." Other reasons for planning to repurchase included: cheaper than regular milk, like the taste, and tastes like fresh milk. The breakdown of reasons given was:

Reason	Users of Dairy Fresh		
	Personal sample	Telephone reinterview sample	Telephone sample
	- - Percent - -		
To have on hand-----	68	58	60
Cheaper than regular milk---	33	20	23
Like the taste-----	29	25	31
Ease of storage-----	15	10	10
Tastes like fresh whole milk	11	20	26
To have for camping, scouting, picnicking-----	10	6	11
Good for cooking and baking-	6	11	9
Miscellaneous-----	1	7	11

Among the homemakers who said they did not plan to repurchase Dairy Fresh, very few specific objections were mentioned about the product. Many of the reasons given indicated satisfaction with their usual fresh milk rather than an objection to Dairy Fresh.

Among 109 homemakers who were reinterviewed by telephone it was possible to inquire about additional purchases of Dairy Fresh in the 2 to 4 weeks since the interview.

When these 109 homemakers were first interviewed, 88 said they planned to repurchase and 21 said they did not. In the time between the first and second interviews, a significant number (33) of the 109 homemakers said they did repurchase (appendix table 28).

Among women who said they did not repurchase Dairy Fresh since they were personally interviewed, the main reasons given for not repurchasing were: just forgot about it, (24 percent); and still have a supply of Dairy Fresh, (18 percent) (appendix table 31).

When interviewed for a second time and asked about future purchase plans, 89 of the 109 women said they planned to repurchase. As would be expected, the majority of these women originally said they planned to repurchase, although a few reversed their original intention to repurchase Dairy Fresh.

Experience with Mixing Dairy Fresh

During the personal interview, a majority of homemakers said the mixing procedure they used worked well; only one in 10 said it worked poorly (appendix table 14).

Directions for making a quart of reconstituted milk from a can of Dairy Fresh dry whole milk are:

1. Add contents of can to one pint (two 8-oz. measuring cups) of cold water and immediately shake well.
2. Now add 1-2/3 cups of cold water. Ready to drink.

(For a creamier product to use on cereals, eliminate step 2.)

Describing the mixing procedure used, respondents reported using various size containers, ranging from a quart to a gallon; and various methods such as shaking, stirring, beating, blending, or a combination of these methods. However, there were no discernible differences in homemakers' opinions about how well the mixing procedure worked for them which could be attributed to the method or container they used (appendix tables 11, 12, and 13).

The majority of these homemakers (86 percent) felt that the mixing instructions on the label were adequate and offered no suggestions for improving them (appendix table 15).

Milk Buying Habits of Homemakers

Homemakers who were personally interviewed were questioned about their usual milk buying practices. Sixty percent said they usually have milk delivered at home, while 37 percent usually buy their milk at the store. A small proportion (3 percent) said they usually got their milk from both sources (appendix table 3).

Half-gallon size containers appear to be the most popular among homemakers. About half (48 percent) said they usually buy this size. About one quarter (26 percent) usually buy quart containers and 29 percent buy their milk in gallon containers (appendix table 1).

These homemakers also reported the amount of milk they used in an average week:

- 23 percent said they used less than 5 quarts
- 47 percent said they used between 5 and 14 quarts
- 29 percent said they used 15 or more quarts
- 1 percent could not determine the amount (appendix table 2).

CONCLUSIONS

Flavor may be the most important single attribute of Dairy Fresh, and it needs to be stored at 40° F. or lower to maintain flavor over time.

The product is convenient to handle and easy to store. A quart-equivalent package occupies very little space and can be stored in the home refrigerator up to 60 weeks without any noticeable deterioration in flavor. It can be purchased in large quantities and stored until needed.

Dairy Fresh dry whole milk can probably substitute for fresh whole milk only in areas where fluid milk prices are relatively high, such as the Eastern Seaboard of the United States. However, it is possible that a market can be developed for dry whole milk which will increase the sales of milk products and will not significantly affect fluid milk sales.

These factors, in addition to the good sales record of Dairy Fresh during the market test indicate that the new product enjoys a favorable commercial potential.

APPENDIX

Table 1.--Before we discuss Dairy Fresh, I would like to ask a few questions concerning your use and your family's use of fresh whole milk. If fresh whole milk is used, in what size container is it usually bought? ^{1/}

	Personal sample
	Percent
Quart-----	26
Half-gallon-----	48
Gallon-----	29
Other-----	1
Never buy fresh whole milk-----	1
Number of cases-----	302

^{1/} Percentages add to more than 100 because some respondents gave more than 1 reply.

Table 2.--During the average week, about how many quart containers does your family use?

	<u>Personal sample</u> <u>Percent</u>
1 or 2 -----	9
3 or 4 -----	14
5 to 9 -----	27
10 to 14 -----	20
15 to 19 -----	11
20 to 24 -----	10
25 or more -----	8
Cannot determine the number of quarts-----	<u>1</u>
Number of cases-----	300

Table 3.--Do you usually have your milk delivered to your home or do you buy it at a store?

	<u>Personal sample</u> <u>Percent</u>
Delivered at home-----	60
Buy at store-----	37
Both-----	2
Other -----	<u>1</u>
Number of cases-----	300

Table 4.--How many cans of Dairy Fresh have you bought in total?

<u>No. of cans</u>	<u>Personal sample</u>	<u>Telephone sample</u>
	<u>Percent</u>	<u>Percent</u>
1 -----	21	19
2 -----	58	48
3 -----	3	1
4 -----	9	9
5 -----	*	2
6 -----	4	9
7 -----	*	1
8 -----	2	3
10 or more -----	3	7
Don't know -----	<u>-</u>	<u>1</u>
Number of cases -----	302	103

* Less than 1 percent.

Table 5.--On how many different occasions did you buy Dairy Fresh?
 (Asked of homemakers who bought more than 1 can of Dairy
 Fresh)

	<u>Personal sample</u> Percent	<u>Telephone sample</u> Percent
Only once-----	75	57
Twice -----	16	15
Three or more times ----	9	23
Don't know -----	-	5
Number of cases-----	239	82

Table 6.--Please tell me why you bought Dairy Fresh ^{1/}

	<u>Personal sample</u> Percent	<u>Telephone sample</u> Percent
To have on hand-----	47	41
Sample tasted like fresh whole milk-	31	22
Sample tasted good -----	23	17
Out of curiosity -----	21	25
Cheaper than regular milk -----	17	20
Superior in taste to powdered or canned milk -----	7	4
To have on hand for camping, scout- ing, or picnicking -----	5	12
Wanted family to taste it -----	4	2
Miscellaneous -----	1	11
Don't know -----	2	-
Number of cases -----	302	103

^{1/} Percentages add to more than 100 because some respondents gave more than 1 reply

Table 7.--Why haven't you or your family used Dairy Fresh yet? (Asked of homemakers who have not used Dairy Fresh.) ^{1/}

	<u>Personal sample</u>
	<u>Percent</u>
Haven't run out of milk yet-----	83
Forgot about it -----	6
Bought for camping, scouting, picnicking, haven't used yet -----	5
Didn't have a container empty to mix it in -----	1
Miscellaneous -----	8
Don't know -----	<u>1</u>
Number of cases -----	88

^{1/} Percentages add to more than 100 because some respondents gave more than 1 reply.

Table 8.--In which of the following ways did you and your family use Dairy Fresh? (Asked of homemakers who used Dairy Fresh) ^{1/}

	<u>Personal sample</u>	<u>Telephone sample</u>
	<u>Percent</u>	<u>Percent</u>
As a beverage -----	87	85
On cereals -----	41	58
In coffee or tea -----	33	38
For baking or cooking ---	31	42
Other ways -----	*	1
Don't know -----	<u>-</u>	<u>1</u>
Number of cases ----	214	95

^{1/} Percentages add to more than 100 because some respondents gave more than 1 reply.

* Less than 1 percent.

Table 9.--Now, I would like to know who in your family used this milk?
 Did you, any other adults 20 or over, any persons between 13-19, or any children under 13 years of age use it? (Asked of homemakers who used Dairy Fresh.)

	<u>Personal sample</u> <u>Percent</u>
Respondent:	
Tried -----	88
Didn't try -----	12
Number of cases -----	214
Families with other adults:	
Tried -----	76
Didn't try -----	24
Number of cases -----	210
Families with children 13-19:	
Tried -----	93
Didn't try -----	7
Number of cases -----	84
Families with children under 13:	
Tried -----	94
Didn't try -----	6
Number of cases -----	124

Table 10.--What unfavorable reactions, if any, did family members have?
 (Asked of homemakers who used Dairy Fresh) ^{1/}

	<u>Personal sample</u>		
	<u>Adults</u> <u>20 or over</u>	<u>Persons</u> <u>13 - 19</u>	<u>Children</u> <u>under 13</u>
	----- Percent -----		
Didn't like the taste; didn't like it--	8	8	8
Didn't like the froth or foam-----	2	1	2
Watery; too watery -----	2	-	2
Didn't like the lumps -----	2	-	1
Too rich or creamy -----	2	5	2
Didn't taste like fresh whole milk ----	2	1	2
Didn't like the film -----	1	3	1
Miscellaneous -----	1	-	1
No unfavorable reactions -----	77	76	81
Don't know -----	6	6	6
Number of cases -----	159	78	116

^{1/} Percentages may add to more than 100 because some respondents gave more than 1 reply.

Table 11.--Now I'd like you to think back to how you or someone in your family mixed this milk. When the milk was first mixed, what type and size container was used? (Asked of homemakers who used Dairy Fresh.)

	<u>Personal sample</u>
	<u>Percent</u>
Quart container -----	48
2-quart container -----	30
1 1/2-quart container -----	7
Gallon container -----	4
Other -----	8
Don't know -----	<u>3</u>
Number of cases -----	214

Table 12.--Was the powder put in the container first or the liquid first? (Asked of homemakers who used Dairy Fresh.)

	<u>Personal sample</u>
	<u>Percent</u>
Liquid first -----	56
Powder first -----	39
Don't know -----	<u>5</u>
Number of cases -----	214

Table 13.--Was it shaken, stirred, beaten, or blended? (Asked of homemakers who used Dairy Fresh.)

	<u>Personal sample</u>
	<u>Percent</u>
Shaken -----	55
Stirred -----	22
Shaken and stirred -----	11
Blended -----	5
Beaten -----	3
Shaken and blended -----	1
Don't know -----	<u>3</u>
Number of cases -----	214

Table 14.--How well did this mixing procedure work? (Asked of homemakers who used Dairy Fresh.)

	<u>Personal sample</u>
	<u>Percent</u>
Very well; well-----	69
Fairly well-----	18
Poorly-----	10
Don't know -----	<u>3</u>
Number of cases-----	214

Table 15.--Do you have any suggestions for improving the instructions on the label? (Asked of homemakers who used Dairy Fresh.)

	<u>Personal sample</u>
	<u>Percent</u>
Yes -----	13
No -----	86
Don't know -----	<u>1</u>
Number of cases-----	214

Table 16.--Here is a card listing statements that have been used to describe Dairy Fresh milk. I'd like to know how you, yourself, feel about these statements. Your opinion may agree with the statements on the left or the statements on the right, or it may fall somewhere in between. Please tell me the number that comes closest to how you feel about this milk. (Asked of homemakers who used Dairy Fresh.)

Rating	<u>Personal sample</u>			
	Good tasting/ not good tasting	Rich milk/ not rich milk	Wholesome/ nutritious not wholesome/ nutritious	Low cost per glass/ high cost per glass
	----- <u>Percent</u> -----			
Highest-----1-----	54	39	55	52
-----2-----	22	19	18	14
-----3-----	8	15	8	11
-----4-----	8	17	7	15
-----5-----	2	4	3	2
-----6-----	2	2	1	1
Lowest -----7-----	2	2	-	2
Don't know-----	2	2	8	3
Average -----	<u>2.0</u>	<u>2.4</u>	<u>1.8</u>	<u>2.2</u>
Cases-----	214	214	214	214

Table 17.--People have different reasons for buying milk. On this card is a list of reasons which may or may not be important when you are buying milk. You can see on the card that the scale goes from 1, meaning very important, to 7, which means not at all important. You may choose these numbers or any of the numbers in between to describe how you feel. Now, how would you rate the importance of taste? How about richness?

(Asked of homemakers who used Dairy Fresh.)

Rating	Personal sample					
	Taste	Richness	Wholesome/ nutritious	Ease of storage	Cost	Size of container
	Percent					
Very important--1---	84	52	83	57	65	51
--2---	7	15	7	8	10	8
--3---	3	16	5	13	7	15
--4---	2	9	2	10	7	9
--5---	1	1	*	4	3	3
--6---	1	2	1	2	1	2
Not at all important --7---	2	5	2	6	7	12
Average-----	<u>1.4</u>	<u>2.2</u>	<u>1.4</u>	<u>2.2</u>	<u>2.1</u>	<u>2.6</u>
Cases -----	214	214	214	214	214	214

* Less than 1 percent.

Table 18.--About how many cans of Dairy Fresh would you expect to buy in the next 4 weeks? (Asked of homemakers who plan to buy Dairy Fresh again.)

Expected to buy---	Personal	Telephone	Telephone
	sample	reinterview	sample
	Percent		
1 or 2 cans-----	32	34	23
3 or 4 cans-----	21	23	22
5 to 9 cans -----	26	21	19
10 to 19 cans -----	10	10	10
20 or more cans -----	2	1	4
None in next 4 weeks -----	3	6	-
Don't, know -----	6	5	22
Cases -----	177	87	70

Table 19.--Have you, or have you not, used nonfat milk in the past year?
 (Asked of homemakers who used Dairy Fresh.)

	<u>Personal sample</u>	
	<u>Percent</u>	
Yes-----	43	
No -----	<u>57</u>	
Number of cases	214	

Table 20.--About how many quarts of nonfat milk do you mix and use in an average month? (Asked of homemakers who have used nonfat milk.)

<u>Quarts per month</u>	<u>Personal sample</u>	
	<u>Percent</u>	
1 or 2 -----	30	
3 or 4 -----	12	
5 to 9 -----	14	
10 to 19 -----	9	
20 or more -----	21	
Don't know -----	<u>14</u>	
Number of cases -----	92	

Table 21.--How many members, including yourself, are in your family?

<u>Number in family</u>	<u>Personal sample</u>	<u>Telephone sample</u>
	<u>Percent</u>	<u>Percent</u>
1 -----	3	1
2 -----	17	18
3 -----	19	17
4 -----	25	22
5 -----	18	21
6 -----	11	8
7 -----	4	5
8 -----	1	7
9 -----	1	1
10 or more -----	<u>1</u>	-
Number of cases-----	302	103

Table 22.--What was the last grade of school you completed?

<u>Item</u>	<u>Personal sample</u> <u>Percent</u>	<u>Telephone sample</u> <u>Percent</u>
Grammar school -----	10	8
High school, incomplete -----	16	17
High school graduate -----	50	47
College, incomplete -----	12	13
College graduate -----	11	12
Not ascertained -----	1	3
Number of cases -----	302	103

Table 23.--In which of the following age groups are you?

<u>Years</u>	<u>Personal sample</u> <u>Percent</u>	<u>Telephone sample</u> <u>Percent</u>
Under 35 -----	37	42
35 to 49 -----	33	37
50 and over -----	30	21
Number of cases -----	302	103

Table 24.--What is the occupation of the head of your family?

	<u>Personal sample</u> <u>Percent</u>	<u>Telephone sample</u> <u>Percent</u>
White collar-----	47	49
Blue collar -----	43	38
Not employed -----	7	10
Don't know -----	3	3
Number of cases-----	302	103

Table 25.--Are you the head of your family?

	<u>Personal sample</u> <u>Percent</u>	<u>Telephone sample</u> <u>Percent</u>
Yes -----	9	5
No -----	91	93
Don't know -----	-	2
Number of cases-----	302	103

Table 26.--Are you, yourself, employed full-time, part-time, or not employed at all?

	<u>Personal sample</u>	<u>Telephone sample</u>
	<u>Percent</u>	<u>Percent</u>
Employed full-time-----	24	19
Employed part-time -----	17	11
Not employed -----	59	67
Not ascertained -----	-	3
Number of cases -----	302	103

Table 27.--To get a good cross-section, we must interview people in all income groups. I will read you a series of broad groups. Please tell me in which of these groups the total yearly income, before income taxes, of this family falls. Please include income from all sources.

	<u>Personal sample</u>	<u>Telephone sample</u>
	<u>Percent</u>	<u>Percent</u>
\$7,999 and under-----	36	30
8,000 to 12,499 -----	37	34
12,500 and over -----	24	15
Don't know -----	3	21
Number of cases ---	302	103

Table 28.--Have you, or have you not, bought any more of the Dairy Fresh since we last talked to you?

	<u>Telephone reinterview sample</u>
	<u>Percent</u>
Yes -----	30
No -----	70
Number of cases-----	109

Table 29.--How many cans of Dairy Fresh have you bought since we last talked to you? (Asked of homemakers who have bought more Dairy Fresh.)

<u>Number of cans</u>	<u>Telephone reinterview sample</u>	
	<u>Percent</u>	
2 -----	52	
4 -----	18	
6 -----	12	
8 -----	6	
10 or more -----	<u>12</u>	
Number of cases -----	33	

Table 30.--And since we last talked, on how many different occasions did you buy Dairy Fresh? (Asked of homemakers who have bought more Dairy Fresh.)

	<u>Telephone reinterview sample</u>	
	<u>Percent</u>	
Once -----	55	
Twice -----	24	
Three or more times -----	<u>21</u>	
Number of cases -----	33	

Table 31.--Why is it that you have not bought any more of this product? (Asked of homemakers who have not bought more Dairy Fresh.) 1/

	<u>Telephone reinterview sample</u>	
	<u>Percent</u>	
Just forgot about it -----	24	
Still have a supply on hand -----	18	
Prefer fresh whole milk -----	13	
Have been ill or away from home -----	9	
Haven't shopped since interviewed -----	8	
Don't like the taste or flavor -----	5	
Easier to buy fresh whole milk -----	5	
Haven't been able to find it in the store -----	1	
Miscellaneous -----	24	
Don't know -----	<u>1</u>	
Number of cases -----	76	

1/ Percentages add to more than 100 because some respondents gave more than 1 reply.

Table 32.--Sales of audit products during test period.

Week ending--	Dairy Fresh : Qt. equiv.	Fluid whole milk		Fluid skim milk		Nonfat dry milk		Buttermilk		Buttermilk biscuits
		Quarts	Quarts	Quarts	Quarts	Quarts	Quarts	Quarts	Cans	
4-13	--	31,543	2,001	10,255	276	927				
4-20	1,980	31,750	1,827	9,089	352	1,107				
4-27	506	31,858	2,192	9,203	232	1,122				
5-4	383	27,496	2,202	8,759	315	821				
5-11	398	27,688	2,018	7,964	289	787				
5-18	405	28,146	1,855	8,599	273	1,083				
5-25	408	26,583	1,923	8,698	257	981				
6-1	395	27,680	1,698	9,050	316	861				
6-8	427	27,826	1,995	8,203	273	1,047				
6-15	393	28,739	1,657	8,619	329	959				
6-22	263	28,246	1,830	8,506	273	860				
6-29	278	--	--	--	--	--				
7-6	466	--	--	--	--	--				

Table 33.---Sale of fluid whole milk during test period.

Store	Week, 1968, ending---											Total
	4-13	4-20	4-27	5-4	5-11	5-18	5-25	6-1	6-8	6-15	6-22	
						--- Quarts ---						
#1	1,487	2,342	1,914	1,628	2,201	2,527	1,511	1,744	1,922	1,902	2,782	21,960
#2	2,607	2,665	2,508	2,148	2,980	2,496	2,077	2,321	2,350	2,797	1,920	26,859
#3	1,659	2,597	2,021	1,543	2,344	2,202	650	1,384	1,696	1,766	1,543	19,405
#4	4,442	3,395	3,512	3,603	3,345	3,333	3,183	2,977	3,453	3,301	3,284	37,828
#5	3,844	3,789	3,537	4,012	3,478	3,691	3,531	3,628	3,326	3,677	2,947	39,460
#6	6,354	6,793	7,865	6,445	4,935	6,220	6,678	6,175	6,030	6,116	6,270	69,881
#7	5,774	5,722	4,872	4,414	3,867	3,159	4,585	5,435	4,383	4,678	4,897	51,786
#8	469	778	1,041	963	938	947	926	935	826	890	763	9,476
#9	4,907	3,669	4,588	2,740	3,600	3,581	3,442	3,081	3,840	3,612	3,840	40,900
Total	31,543	31,750	31,858	27,496	27,688	28,146	26,583	27,680	27,826	28,739	28,246	317,555

Table 34.--Sales of fluid skim milk during test period.

Store	Week, 1968 ending --												Total
	4-13	4-20	4-27	5-4	5-11	5-18	5-25	6-1	6-8	6-15	6-22	6-29	
						Quarts							
#1	194	131	119	190	138	152	148	94	169	118	226	1,679	
#2	118	148	139	336	202	169	181	74	198	139	151	1,855	
#3	165	52	118	77	81	90	16	62	78	50	10	799	
#4	231	261	261	257	234	240	266	223	268	230	205	2,676	
#5	223	203	197	238	254	255	262	215	232	243	186	2,508	
#6	440	263	773	475	534	340	506	487	433	311	457	5,019	
#7	397	464	391	374	351	326	333	336	393	340	369	4,074	
#8	32	41	42	63	18	57	33	47	42	12	22	409	
#9	201	264	152	192	206	226	178	160	182	214	204	2,179	
Total	2,001	1,827	2,192	2,202	2,018	1,855	1,923	1,698	1,995	1,657	1,830	21,108	

Table 35.--Sales of buttermilk during test period.

Store	Week, 1968, ending --														Total
	4-13	4-20	4-27	5-4	5-11	5-18	5-25	6-1	6-8	6-15	6-22	6-29	7-6	7-13	
#1	14	43	3	32	29	27	38	36	26	49	30	327			
#2	25	36	18	23	22	17	19	11	14	15	16	216			
#3	20	35	26	10	27	30	6	15	18	14	3	204			
#4	83	39	39	50	53	52	44	59	42	59	36	556			
#5	25	43	42	33	43	8	32	58	26	40	41	391			
#6	62	42	33	50	25	57	45	58	38	77	53	540			
#7	31	54	33	54	43	35	29	36	55	38	47	455			
#8	2	12	4	11	5	5	6	5	8	1	9	68			
#9	14	48	34	52	42	42	38	38	46	36	38	428			
Total	276	352	232	315	289	273	257	316	273	329	273	3,185			

Table 36.--Sales of nonfat dry milk during test period.

Store	Week, 1968, ending--														Total
	4-13	4-20	4-27	5-4	5-11	5-18	5-25	6-1	6-8	6-15	6-22	Quarts			
#1	1,825	1,371	1,144	1,269	982	1,219	1,135	1,531	998	1,307	1,382	14,163			
#2	950	1,031	1,010	1,104	930	790	938	1,169	1,247	1,082	965	11,216			
#3	1,669	1,170	858	1,236	1,125	1,532	935	1,571	934	919	853	12,802			
#4	1,767	1,178	1,704	950	1,390	1,305	899	1,305	1,305	1,399	1,421	15,513			
#5	769	715	770	650	607	631	808	743	826	755	851	8,125			
#6	755	892	857	893	725	824	839	874	893	937	880	9,369			
#7	1,142	1,327	1,536	1,322	1,270	1,187	1,078	1,258	1,059	1,139	1,091	13,409			
#8	525	407	537	562	488	510	446	422	449	488	451	5,285			
#9	853	993	787	773	447	561	324	583	492	593	612	7,018			
Total	10,255	9,089	9,203	8,759	7,964	8,599	8,698	9,050	8,203	8,610	8,506	66,900			

Table 37.---Sales of buttermilk biscuits during test period.

Store	Weeks, 1968, ending--												Total
	4-13	4-20	4-27	5-4	5-11	5-18	5-25	6-1	6-8	6-15	6-22		
#1	72	58	91	11	79	94	16	121	99	212	951		
#2	31	15	149	120	58	298	64	58	127	21	1,041		
#3	26	51	106	85	81	62	22	115	33	28	661		
#4	181	274	274	220	215	198	244	193	210	142	2,449		
#5	231	125	98	150	64	66	75	79	99	79	1,141		
#6	100	240	153	37	72	80	189	156	113	64	1,305		
#7	62	165	134	84	99	52	112	91	128	92	1,108		
#8	103	78	38	30	4	125	27	109	42	124	754		
#9	121	101	79	84	115	104	112	125	108	107	1,154		
Total	927	1,107	1,122	821	787	1,083	861	1,047	959	869	10,564		

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